Maternal-Child Interactions and the Development of Social Competence

by

Adele Mattinat Spegman

A Dissertation

Presented to
Oregon Health Sciences University
School of Nursing
in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy

April 12, 2000

APPROVED:

[redacted]

Gail M. Houck, RN, NP, PhD, Associate Professor, Research Advisor

[redacted]

Barbara Stewart, PhD, Professor, Committee Member

[redacted]

Celia Capuzzi, RN, PhD, Professor, Committee Member

[redacted]

Kathleen Potempa, RN, DNSc, FAAN, Dean, School of Nursing

ABSTRACT

TITLE: Mother-Toddler Interaction and the Development of Social Competence

AUTHOR: Adele Mattinat Spegman

APPROVED [redacted]
Gail M. Houck RN NP PhD

Social competence, an interactive style characterized by engagement, cooperation and positive affect, is thought to emerge in toddlerhood through the reciprocal nature of mother-child interactions. Its foundations originate as the toddler explores the social environment and forms understandings about the self in relation to others. Incompetent social behavior, manifested as behavior problems, is stable throughout early childhood and is associated with problems in adolescence. Interactions around food provide the young child with consistent and predictable social experiences with mother, from which interactive patterns are patterned. Unlike infancy, no established measure is available to assess dyadic interactions around food during toddlerhood. A new observational coding system, the Snack Scale, was developed to assess mother-toddler interactions during eating episodes. This study examined the reliability and validity of the Snack Scale, and explored the associations between mother-child interactive behavior during eating episodes, the child's social competence in other settings, and child temperament. A longitudinal design was used to examine toddlers' social behaviors in relation to maternal behaviors at 12, 24 and 36 months of age. Video-taped observations of 126 mother-toddler dyads during snack, collected as part of a larger study examining mother-child interactions and adaptions of toddlers, were coded using the Snack Scale. The scale classifies mothers on the basis of maternal responsiveness and control and children on the basis of autonomy and engagement, and assigns global ratings of dyadic mutuality and maternal and child affect. Reliability was established by assessing the internal validity, stability and congruence of the Snack Scale measures. Validity was established using other observational measures of mother-toddler interaction: the Control Autonomy Balance Scale (play), and the Nursing Child Assessment Teaching Scale (teaching). The Snack Scale differentiated the outcome of interest, child social competence in other settings, assessed using the Adaptive Social Behavioral Inventory. Child temperament, measured using the Toddler Temperament Scale, contributed to child expressions of social competence but not to the assignment of maternal and child interaction styles. Maternal interactive styles were distinguished by manifestations of her responsiveness and control; child styles differed according to displays of mother-directed initiations and responsiveness to her directives. The majority (90%) of mothers and children were assigned the same interaction pattern at two of three occasions. Maternal styles were associated with displays of disruptiveness at 12 months and expressiveness at 24 months; child styles influenced expressiveness at 24 and 36 months. Maternal style mediated the influence of difficult temperament, albeit a limited amount. The findings are discussed as supporting existing theory regarding social development and as directing further study. Limitations to the study are identified and implications for clinical practice are presented.

Acknowledgment of Financial Support

This dissertation research was funded in part by the following:

Instituitional National Research Service Award, Family Nursing
National Institute for Nursing Research, NIH, 5 T32 NR7061-07

Individual National Research Service Award
National Institute for Nursing Research, NIH, F31 NR7314-01A1

Beta Psi, Sigma Theta Tau International
Research Award

Acknowledgments

I would like to acknowledge the encouragement and support of my husband Jerry and daughters Martha and Abby. My family has helped me to keep dissertation work in perspective -- or has reminded me to regain perspective! Their patience, understanding and love have sustained me throughout the past several years, as did the neck rubs, bags of chips and endless cups of tea. Thank you all for making this possible.

Much gratitude is extended toward my friends who worked with me on the second floor. Discussions with Anna Anderson and Cynthia Guertin were instrumental in helping me to differentiate, describe and measure child behaviors. I am especially grateful to Jesika Samuelson and Tammy Schuman for rescuing me from computer and graphic woes. And I am so lucky to have been working for Dr. Beverly Hoeffer, who has been flexible and supportive throughout the seemingly endless process of analysis and revision. I truly benefitted from working alongside the wonderful folks in ORD: thank you for reminding me to laugh and enjoy my work.

Finally, thanks to this dissertation committee! I feel quite fortunate to have worked with three wise scholars who guided my research with gentleness and patience. I extend my appreciation to Dr. Gail Houck for generously sharing her research data, time and thoughtful understandings about research processes. Her mentorship has included perspective-taking and humor throughout this project and my doctoral studies overall. I also extend my appreciation to Dr. Barbara Stewart for conveying her ongoing enthusiasm for this study in conjunction with her analytical expertise. And I thank Dr. Celia Capuzzi for her thoughtful questions, which challenged me to use plain language to convey both the complex and the apparent. Thank you.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

MOTHER-CHILD INTERACTIONS AND THE DEVELOPMENT OF SOCIAL COMPETENCE

CHAPTER I

INTRODUCTION

Social competence refers to an individual's style of interacting with others. It has been defined as effectiveness in interaction (Rose-Krasnor, 1997), reflecting the simultaneous achievement of personal goals and positive relationships over time and across contexts (Rubin & Rose-Krasnor, 1992). Social competence is associated with socio-emotional health in young children (Yockelson, 1998) and correlated with childhood peer relations and academic achievement (Brier, 1995; Parker & Asher, 1987, Parker, Rubin, Price & DeRosier, 1995). Incompetent social behavior is linked to chronic illness in school-aged children (Gortmaker, Walker, Weitzzman & Sobol, 1990) and childhood depression, anxiety, aggression, and delinquency (Achenbach, 1991). Furthermore, girl's incompetent social behavior during adolescence is predictive of poorer overall physical health, substance abuse and reproductive problems in early adulthood (Bardone, Moffitt, Caspi, Dickson, Stanton & Silva, 1998). Early competence is carried forward into school and remains stable throughout childhood (Achenbach, 1991; Brier, 1995). However, little is understood about the development of social competence. Our lack of information about how to facilitate the development of social competence limits clinicians' efforts to prevent maladaptive child health outcomes.

The early mother-child relationship is viewed as crucial to subsequent child development. Social competence emerges in toddlerhood through the reciprocal nature of mother-child interactions. It is theorized that the young child establishes interactive patterns which become the templates for future social experiences apart from the mother. Initial social experiences include interactions with caregivers around food. Mealtimes provide consistent and predictable opportunities for the young child to engage with mother and to experience parent-structured social exchanges. Thus, eating situations are a particularly salient setting for examining the development of social competence. Parent-child feeding and teaching interactions during infancy have been found to predict not only eating disorders in infancy (Chattor, Hirsch & Persinger, 1998) and childhood (Johnson & Birch, 1994) but also, subsequently, more general developmental outcomes (Sumner & Spietx, 1994). Therefore, feeding interactions during toddlerhood are especially important to the development of social competence given the emergence of autonomy -- which evolves around eating, verbal skills and exploration of the social environment.

Maternal-child populations are targeted by family nurses in a variety of community health services and settings, including well-child care, developmental screening, early intervention, and parenting programs. Nurses are routinely used for information and guidance regarding toddler eating behaviors, providing unique opportunities to assess early social competence and propose developmentally appropriate goals. Additionally, nurses are positioned to intervene early to improve mother-child interactions and minimize the adverse outcomes related to poor social competence. Knowledge regarding the development of social competence from toddlerhood to school

age, in relation to mother-child interactions in eating situations, can be applied to both direct and refine nursing interventions regarding parenting. Specifically, early interventions with mother-child interactions may optimize the child's development of social competence. Knowledge of the specific manner in which parent-child interactions are related to the development of social competence is important for all parents and particularly relevant for situations which are stressful for young families, such as teen and single parenting, parental discord and family violence (Egeland, Kalkoske, Gottesman & Erickson, 1990).

This study explored the development of social competence as an outcome of mother-toddler interactions during snack episodes. A newly developed coding system was used to assess the pattern of toddler social behaviors in relation to mother behaviors. Patterns of dyadic interactions during snack were examined at the child's age of 12, 24 and 36 months and in relation to toddler temperament. Toddler temperament was thought to transact with mother-child interactive behavior to influence dyadic interaction patterns and propel the development of social competence during toddlerhood. It was expected that increasingly complex interaction patterns would emerge, reflecting developmentally-motivated reorganizations of mother and toddler behaviors. The reliability and validity of the Snack Scale coding system were assessed using other observational measures of dyadic interaction patterns and measures of child social competence during toddlerhood. The knowledge gained from this study can advance our understandings of parent-child interactions and health-promoting parenting behaviors and contribute to assessment and intervention strategies.

CHAPTER II

REVIEW OF LITERATURE

Social competence, or prosocial behavior, describes one's effectiveness in social interactions (Rose-Krasnor, 1997). It generally refers to actions which benefit others or promote harmonious interpersonal relations (Hay, 1994) and includes behaviors such as sharing, cooperating, helping and conveying comfort (Hay & Reingold, 1983). The nature of social interaction suggests that social competence entails skills to initiate and sustain nondisruptive interactions (Baumrind, 1967) as well as contingent responsiveness to the demands of a given situation (Hay, 1994; Roberts & Strayer, 1987). Self-regulation is an essential part of social competence, as it allows the child to put aside his/her own concerns and respond to the concerns of others. Empathy, required for taking the other's perspective, facilitates sharing, cooperating, helping and comforting. Social competence also implies a sense of trust in others and that interpersonal relationships and interactions are perceived as satisfying and pleasurable.

Social competence is also viewed as the behavioral manifestion of the self in relation to others (Houck, 1998). In this way, social competence is understood as a developmental outcome in which self-concept, self-esteem, and autonomy are integrated and visualized in relationships and interactions (Houck & Spegman, 1999b). Self-concept, or what an individual knows about him/herself, includes perceptions about one's ability to impact the social environment (Connell, 1990). Self-esteem, or what an individual feels about him/herself, involves a sense of one's lovablility and worthiness

which arises from early experiences of connectedness and relatedness with the primary caregiver (Bretherton, 1980; Cassidy, 1990). Autonomy reflects the balance of self-assertion and self-regulation, necessitating the negotiation and accommodation apparent in positive social interactions. These self components are thought to emerge through early social relationships (for a summary, see Houck & Spegman, 1999b). Thus, the foundations for social competence are likely to develop through these same experiences.

Developmental Perspective

The development of social competence occurs in the larger context of human psychosocial development. Development is "a perpetual state of active reorganization" (Sameroff & Chandler, 1976, p.235) that occurs through the interactions of the child, parent and environment. Maturation of motor and cognitive abilities causes earlier behaviors to evolve into patterns of greater complexity that take on new meanings (Sroufe & Rutter, 1984). Competence with early developmental tasks is a subtle but positive influence on future tasks, as early competencies have ongoing developmental importance (Cicchitti, 1987). Incompetent adaptation at one stage makes adaptation difficult in the next and is thought, for this reason, to continue to influence adaptation in a negative manner throughout life. Young children who cannot successfully negotiate the developmental tasks that need to be accomplished are assumed to be vulnerable for future problems (Cicchitti, 1987).

Such deviant development is assumed to reflect a continuous malfunction in social interactions which prevent successful adaption (Cicchitti, 1987). Although children have a tendency to "self-right" given contextual modifications which will support

developmental competence (McCall, 1981), self-righting tendencies weaken after the second year (McCall, 1981) and may be constrained to the salient period for specific developmental tasks (Houck, 1998). Modifying previously malfunctional interactions is assumed to enable self-righting. Conversely, unsupportive interactional environments during toddlerhood with limited development of social competence are thought to place children at-risk for maladaptive social behaviors at school-age. Accordingly, it is essential to understand the trajectory of the development of social competence and the ongoing interactions that contribute to it in order to provide interventions that permit "self-righting."

Manifestations of Social Competence in Young Children

Infancy

From birth, infants are drawn toward social interactions. Newborns attend to the faces and voices of others (Field, Woodston, Greenberg & Cohen, 1982), mimic facial expressions (Meltzoff, 1985; Meltzoff, 1990) and at ten weeks, respond appropriately to the mother's displays of different emotions (Haviland & Lelwica, 1987; Toda & Fogel, 1993; Zlochower & Cohn, 1996). Participation in social interactions is facilitated by newborn reflex activities which are temporally patterned and rhythmical, such as suck/pause, providing openings for caregiver responses (Kaye, 1982). Subsequent social behaviors, such as gaze at/gaze away and smiling/vocalization, build upon such rhythms as an early form of cooperative turn-taking (Meltzoff, 1990; Roe, 1997). Infants respond in a friendly manner to other friendly persons and participate in social games by 3 months of age (Hay & Rheingold, 1983). Indiscriminate friendliness changes to wariness as

infants distinguish strangers from mother at four to six months of age, and cry or whimper when strangers approach between seven and nine months of age (Emde, Gaensbauer & Harmon, 1976). The appearance of these person-specific social responses coincides with the emergence of integrated and goal-directed infant behaviors in the second six months, which are organized around proximity and interaction with the caregiver (Bretherton, 1985).

Previous and ongoing experiences with the caregiver become the basis of an emotional bond or attachment relationship, which all infants form by the end of the first year (Carlson & Sroufe, 1995). The infant's experience within the attachment relationship forms an internal working model, which guides the infant's interpersonal behavior and interpretations of social experiences (Bowlby, 1982; Bretherton, 1985; Seifer & Schiller, 1995). The cumulative interactions with the attachment figure, usually the mother, shape the infant's attributions about the self and generalized understandings of others (Bowlby, 1982; Carlson & Sroufe, 1995). On this foundation, social competence develops.

Transition to Toddlerhood

Further development, such as language, locomotion, and individuation and separation from the mother, occurs between twelve and eighteen months and enables the infant to take a more active role in initiating and maintaining interactions. Self-regulation incorporates social referencing, as infants use the attachment figure's affective behavior as cues (Grusec & Lytton, 1988). Experiences of causality and recognition of one's efficacy are reflected in the infant's repertoire of goal-directed actions which convey social meanings (Hay & Rheingold, 1983). Social competence during this transition is

reflected in the sharing that often emerges in the context of play and food, as seen with pointing, holding up items and offering items (Grusec & Lytton, 1988). Providing comfort, another indication of social competence, is extended in egocentric ways, such as bringing the distressed person a teddy bear (Zahn-Waxler & Radke-Yarrow, 1990).

Toddlerhood

Social competence becomes more elaborate from eighteen and thirty-six months and is manifested with family and peers. Cooperative and helpful actions are evidenced in toddlers' interest in playing games and pretending, voicing a desire to help (Hay & Rheingold, 1983) and providing instructions when others fail to take turns (Ross & Lollis, 1987). Compliance with others' requests, another form of cooperation, brings pleasure to toddlers (Rheingold, Cook & Kowlowitz, 1987). Self regulation is furthered with awareness of caregiver-defined social and task demands and shifts from reliance on caregiver controls to an age-related capacity for self-control (Koop, 1982).

Preschool and Childhood

Manifestations of social competence shift in preschool and kindergarten, during the third, fourth and fifth years. By the third year, children have developed the capacity to self evaluate using the standards, rules and goals transmitted directly through teaching and indirectly through social referencing (Lewis, 1997). Previous behaviors, such as empathy and cooperation, are less visible in late todderhood. Social competence begins, instead, to reflect deliberate decisions and an awareness of the social cues that regulate behaviors such as sharing, reciprocity, responsibility, and "deservingness" (Hay, 1994). It is significant that the lack of social competence, assessed as behavior problems, is stable

from 2-5 years and throughout childhood into adolescence (Achenbach, 1991; Brier, 1995; Parker, Rubin, Price, & DeRosier, 1995). When assessed as peer relations among school children, incompetent social behavior predicts problems in later life (Parker & Asher, 1987; Parker, et al, 1995). Thus, early social experience seems to provide the foundation for later understandings about social behavior.

Measuring Social Competence in Young Children

Three general approaches are used to operationalize social competence in child development research: as prosocial behaviors, as behavior problems and as peer relations. Each measurement approach provides a different perspective or aspect of knowledge about the development of social competence, with associated limitations and assumptions. Furthermore, the applicability of each approach must be considered in relation to the norms of developmental abilities and experiences.

Prosocial Behaviors

Social competence is often studied as manifestations of prosocial behaviors. Behaviors which facilitate agreeable interpersonal relations are operationalized as discrete actions, such as sharing, cooperating, helping and conveying comfort. Measurement reflects the frequency with which the behavior occurs, reported by a parent, teacher or self or as observed by a researcher. Obviously, self-reports are less successful with young children. Parent reports are easiest to collect and are considered reliable, as the parent has observed the child's behavior across time and contexts.

This measurement approach focuses on specific behaviors which are operationalized according to the researcher's understandings. Behaviors may be

appropriate social actions in one context but not another and reflect gender, socioeconomic, culture and ethnic perspectives. Prosocial actions may be motivated by either altruism/concern for the other or self interest. However, since this measurement focuses on the function of behaviors as probable consequences, no assumptions can be made about the underlying purpose or "true intent" of behaviors (Hayes, 1994). As noted by Parker and Asher (1987), research is lacking on children's perceptions and beliefs about their social relations. Prosocial behaviors which are defined and interpreted from the researcher's perspective may not reflect the meanings attributed to the behaviors by the child.

Behavior problems

Social competence is also operationalized as an inverse measure, focusing on behavior problems as manifestations of socially incompetent behavior. Standardized tools identify behaviors which are deviations from age-appropriate norms. Such behaviors are defined according to the expectations of child behavior (e.g., parents, daycare providers, teachers, developmental psychologists) along a range of problematic behaviors. As with prosocial behaviors, measurement focuses on the frequency with which the problematic behavior occurs and may be reported by a parent, teacher or self or observed by a researcher.

Behavior problems are typically examined as the manifestation of two broad categories of incompetent behavior: internalizing and externalizing. Others have described the contrasting behavior patterns as personality problems and conduct problems (Pederson, 1961), inhibitition and aggression (Miller, 1967), and overcontrolled and

undercontrolled behavior (Achenbach & Edelbrock, 1978). Internalizing behaviors are focused inward towards the self and serve to restrain social interaction. Such behaviors are reflected in depression, anxiety, withdrawal and somatic complaints (Achenbach, 1991). Externalizing behaviors focus outwards, manifested as aggression towards others and delinquency (Achenbach, 1991). The distruptive, "acting out" nature of these behaviors has the effect of repelling social interactions. Achenbach (1991) notes that although internalizing and externalizing behaviors represent contrasting behavior problems, the scales measuring the categories are not mutually exclusive. Children with predominantly high internalizing problems are likely to have some degree of externalizing problems and visa versa.

Tracking the relative frequency and intensity of behavior problems identifies clinically significant behavior problems, facilitates diagnosis and intervention, and provides information about the effectiveness of interventions. This approach also provides insights about the influence of contextual variables, interaction partners. The measurement of behavior problems over time may identify different developmental trajectories for children with socially competent and incompetent behavior. However, such outcomes will contain little information about the processes in early childhood which lead to the problematic behaviors. Furthermore, it is possible that judgements about what constitutes behavior problems are limited by the same issues as described regarding prosocial behaviors, e.g., socioeconomic, culture and researcher bias.

Peer relations

Social competence has also been measured as peer relations during childhood. This approach addresses the interpersonal aspects of social competence. It highlights behaviors as patterns and styles of responding to social partners and relies on the judgements, experiences and perceptions of interaction partners. Data collection tools include measures of peer acceptance/ rejection, peer measures of behavior, teacher measures of peer acceptance/rejection, and observations of peer interactive behaviors (Parker & Asher, 1987). This measurement approach assumes that the relational dimensions of social competence are reflected in the quality of interpersonal behaviors. Peer relationships are considered important for healthy social development and future socialization, as evidence has accumulated linking low-accepted children with social maladjustment as adults (Parker & Asher, 1987). At a theoretical level, peer relations may reflect the salient developmental relationships following, and extending from, parental and family relationships. Conceptualized this way, peer relations provide a "second wave" of significant relationships throughout the process of development. Thus, insights into the development of social competence may be provided through longitudinal research on parent-child relationships and subsequent child-peer relations.

Peer-based measures of behavior focus on actual behaviors (what is the child like?) while peer assessments are interpretations of behavior (is the child liked?). Parker and Asher (1987) note that interpretation of the peer measures can miss conceptual differences, as only recently were differences recognized between two categories of low-accepted children. Rejected children manifest aggressive and disruptive behaviors which

remain fairly stable over time, experience more academic problems and report greater loneliness and social dissatisfaction. In contrast, neglected children - who tend to be less interactive - do not have friends but are not disliked and are similar to popular children with regards to academic difficulties and feelings of loneliness. Parker and Asher also note that teacher measures of peer acceptance-rejection are confounded by limited information of psychometric properties. Additionally, observational measures of peer interactions must account for the transactional nature of the behaviors, as a child may respond differently according to the interactive partner or contextual variables (Parker & Asher, 1987).

Contributions to the Development of Social Competence

Maternal Contributions

Parenting research has identified diverse variables which influence children's developmental outcomes, including parents' childhood experiences, education, knowledge of child development, mental health, life stresses and satisfactions (Vondra & Belsky, 1993). Additionally, developmental outcomes are related to the larger social context of family life, studied as intimate relationships, social supports, work, income level and resources (Okagaki & Divecha, 1993). However, the bulk of child development research attributes child development outcomes to variations in the quality of maternal caregiving (Barnard, Hammond, Booth, Bee, Mitchell, Spieker, 1989; Gaussen & Stratton, 1985; Roberts & Strayer, 1987).

Ainsworth's research relating maternal behavior to infant attachment security provides pivotal understandings about maternal interactive qualities (Ainsworth, Blehar,

Waters & Wall, 1978). Home observations of mother-infant dyads found mothers conveyed distinct dimensions of acceptance, accessibility, cooperation and sensitivity in verbal and nonverbal caregiving (Ainsworth, et. al., 1978). The quality of maternal interactions is highly correlated with infant attachment behaviors reflecting maternally-derived security and comfort (Ainsworth, et. al., 1978; Pederson, Moran, Sitkno, Campbell, Ghesquire & Action, 1990). Sensitive and responsive caregiving is associated with toddler emotional socialization and regulation (Gaussen & Stratton, 1985; Roberts & Strayer, 1987), which are significant aspects of social behaviors.

Developmentally facilitative caregiving is distinguished more by the manner in which mothers interact with children rather than the content of the interaction (Mize & Pettit, 1997; Kinderman & Skinner, 1988). Contingent maternal responsiveness reflects well-timed, contextually and developmentally appropriate responses to child-initiated actions (Roe & Drivas, 1997; Skinner, 1986). Contingency necessitates that maternal behaviors are modified throughout infancy and toddler development, especially during infancy and toddlerhood as the child's competencies evolve (Sander, 1976). Roe and Drivas (1997) found that the well-paced interactions of attentive mothers predicted a higher frequency of infant-initiated actions as early as three months. Such maternal behaviors are also correlated with toddler self-regulation (Raver, 1996) and toddlers' attentive, contingent turn-taking with the mother (Dunham & Dunham, 1995). Thus, it is likely that social competence develops as the child experiences maternal contingent responsiveness in multiple contexts throughout early development.

However, it is not clear if such experiences must be ongoing throughout early life. It is possible that some early periods are more salient for the development of social competence than others, such as toddlerhood in contrast to infancy. It is also unknown if another individual can compensate for the lack of maternal contingent responsiveness. The extent to which maternal interactive quality is affected by contextual variables is also uncertain. Maternal interactive qualities may be more readily demonstrated in some contexts than in others, raising questions regarding the consistency of maternal qualities across caregiving contexts.

Child Contribution: Temperament

Children are considered to be active agents in their own development (Stafford & Bayer, 1993). Child behavior influences parental behavior, thus parenting can be viewed as a process of ongoing responses to the child's behaviors (Stafford & Bayer, 1993). Unique styles of behavior are apparent at birth, manifested through newborn responses to social interactions, environmental stimulation, and stress (Brazelton, 1973). Children also affect their caregivers and their caregiving environments through displays of emotions, biological needs and drives, and self-regulatory behaviors (Connell, 1990; Stafford & Bayer, 1993).

Temperament, then, refers to a characteristic style of behavior and emotional response (Prior, 1992). It is used to describe the characteristic style of stimulus-invoked responses, or the child's interaction with the environment, and represents the child's initial contributions to the developmental process. Thomas (as cited by Carey, 1985) defines temperament as the "how" of behavior to differentiate it from capacities ("what")

and motivations ("why"). Although debate surrounds definitions of temperament, it is accepted to be biologically based and manifested as identifiable patterns in infancy which persist over time and across contexts. Agreement exists that the stable factors of temperament include sociability, activity and emotionality (Prior, 1992). Furthermore, there is agreement that temperament characteristics appear to stabilize by the age of three years (Melvin, 1995). Adverse and difficult temperaments are thought to place children at a psychosocial risk while easy or positive characteristics appear to serve as a protection against poor outcome (Prior, 1992; Rutter, 1987).

Understandings and measurement of temperament focuses attention on the child's unique style of responding to new and unfamiliar situations. Thomas and Chess (1977), in groundbreaking research, defined nine dimensions of temperament: activity level, rhythmicity, adaptability, approach or withdrawal, sensory threshold, intensity, distractibility, and persistence. The dimensions measure specific facets of observable behaviors: *activity* level in relation to inactivity; *rhythmicity* as the predictability of biological functions (i.e., eating, sleeping); *adaptability* to situational changes; *approach* tendencies versus withdrawal from new situations; *sensory threshold* required to elicit responses to environmental stimuli; *intensity* of the energy level of communicative behaviors; *mood* as tendencies towards positive or negative affect; *distractibility* as the level of stimuli required to divert attention; and *persistence* in remaining engaged in a difficult task (Thomas & Chess, 1977). The dimensions are clustered to describe "difficult," "slow to warm up," "intermediate-high," "intermediate-low" and "easy" temperaments (Fullard, McDevitt & Carey, 1984; Houldin, Fullard & Heverly, 1989).

The easy temperament is characterized by rhymical, approachable and adaptable behaviors of mild intensity and positive mood. In contrast, the difficult temperament is reflected in arrhythmical, withdrawing, low adaptability, intense behaviors and negative mood. The slow to warm up temperament is defined as slowly approaching, mildly intense behaviors and negative mood. Contemporary temperament research focuses on the assessment of difficult temperament styles. The five dimensions of approach, activity, intensity, mood and adaptability are used to assess the overall degree of temperament difficulty.

The child's psychosocial development is thought to be influenced by the "goodness of fit" between child temperament and environment. According to Thomas & Chess (1977), it is not the temperament itself that presents a developmental risk, but rather, risk is presented through the interaction of temperament with the wider context (Prior, 1992). Risk increases conversely with the capacity of the child to adapt to the environment, influenced in part by temperament, and in part by the capacity of the environment to adapt to the child. Parents are a significant component of the young child's environment. For instance, as noted by Carey (1985), parental expectations and coping capacities strongly affect the child's interactive environment. Such parental factors are influenced, in turn, by cultural assumptions and age-related differences in tolerance for bothersome child behaviors.

Parental influence regarding environmental structure, content and socio-emotional tone has been explored in multiple areas of maternal-child research. Maternal perceptions of child temperament correlate with the quality of mother-child interactions (Houldin, et

al., 1989; Spangler, 1990) and infant attachment security (Coffman, Levitt & Guacci-Franco, 1995). Difficult toddler temperaments are associated with maternal depression (Gross, 1989) including depression in the postpartum period (Beck, 1996). The relationships are not surprising, since depression limits the mother's ability to adapt behaviorally to their child's temperament style or to express her feelings regarding the child's lovability and worthiness.

Difficult temperament has been linked with behavior problems in infants and children (Medoff-Cooper, 1995; Prior, 1992), and subsequent antisocial behaviors (Brier, 1995). Temperament has been proposed as the underpinnings of two components of conscious development in children, influencing manifestations of affective discomfort and behavioral control (or moral regulation/vigilance) in children aged 21 - 70 months (Kochanska, Murrary, Jacques, Koenig & Vandegeest, 1996). Koshanska and Aksan (1995), in their study of the associations between maternal control, child compliance, and manifestations of mutually positive affect, discuss the need for research on the interplay of child temperament and socialization.

Less is understood about the influence of temperament in spontaneous social settings (Hay, 1994), yet it is likely that temperament exerts significant influence on the development of social competence. Raver (1996) suggested a curvilinear relationship exists between emotionality and the dimensions of sociability and activity. Highly emotional, active children may have difficulty regulating anger or excitement and respond aggressively; moderately emotional, sociable children may be sensitive and responsive to others' behavior and respond prosocially; highly emotional but less sociable children may

be overwhelmed by others' excitement or distress and respond anxiously or withdraw from the social interaction.

It is likely that social competence develops along diverse pathways according to the interactions of temperament, maternal interactive qualities and other contextual variables. Inhibited toddlers were found to have fearful temperaments and their mothers were warm, but controlling and either unresponsive or highly oversolicitous (Rubin, Hastings, Stewart, Henderson & Chen, 1997). Poor social competence in kindergarten, as manifested in externalizing behaviors, was not predicted by toddler temperament but was predicted by 18 month measures of parent negative behavior at home (frequent displays of cohersiveness), single-mother family status, and child negative behavior in a peer playgroup (Fagot & Leve, 1998). And when social competence was conceptualized as "committed compliance" to maternal requests, the effectiveness of maternal discipline strategies was related to toddler temperament (Kochanska, 1995). When temperament was assessed in terms of fearfulness/anxiety proneness, gentle maternal discipline which de-emphasized power predicted compliance for children who were relatively fearful and anxious, while the security of the child's attachment predicted compliance for the relatively fearless children. Thus, it is possible that the influence of difficult child temperament is inversely related to social competence but mediated by maternal interactive qualities.

Mother-Child Interaction in an Eating Situation

Contributions of Interactive Contexts

Since social competence entails interpersonal skills, it is logical that the development of social competence is examined within maternal-child interactions throughout childhood. Kinderman and Skinner (1988) suggest that contextual variables, such as the developmental tasks of waking, eating and dressing, provide a structure for maternal-child interactions and influence maternal contingency patterns. The development of social competence has been examined in a variety of contexts, including situations of children's distress (Roberts & Strayer, 1987), limit-setting (Kochanska & Aksan, 1995; LeCuyer, 1995), play (Denham, 1992; Houck, 1991; Lay, Waters & Park, 1989), teaching (Barnard, et al., 1989; Denham, 1993) and mealtimes (Johnson & Birch, 1994; Sumner & Spietz, 1994; Valtolin & Ragazzoni, 1995).

Although nursing evaluates feeding episodes for insights into the quality of parent-infant interactions, eating episodes with parents and their toddlers are not systematically examined. The Nursing Child Assessment Feeding Scale (NCAFS) (Sumner & Spietz, 1994) assesses parent and infant contributions to the quality of early social interactions up to 12 months. While the concepts underlying the NCAFS may be applicable to toddlerhood, the individual's contributions and interactive patterns are changed by developmentally salient behaviors, motivations and meanings. The proposed study will extend current knowledge and assessment approaches used during infancy to eating interactions during toddlerhood.

Barnard and others have described developmentally facilitative interactions as mutually adaptive, synchronous and reciprocal responses to the other's behavioral cues (Barnard, et al, 1989; Carlson & Sroufe, 1995), evident in enmeshed, engaged patterns of mother-child interaction (Sander, 1976). The mother and child influence one another and jointly contribute to their interactions, although mothers are given responsibility to "lead/direct" interactions (Sander, 1976). The influence of child behaviors on maternal behavior is acknowledged (Carlson & Sroufe, 1995), yet it is the modification of maternal behaviors that is necessitated throughout toddler development (Sander, 1976). The nature of maternal behaviors may influence the child's responses as well as be sustained by the child's responses to maternal behaviors.

Little is understood about the importance of the contextual variables for developmentally facilitative interactions. However, interactive contexts are likely to contribute to the development of social competence as well as be shaped by the dyadic interaction. It may be that different contexts influence specific aspects of social competence, such as self regulation in limit-setting, negotiation in mealtime, and shared affect in play. Alternatively, the quality of interactive symmetry and synchrony may reflect the quality of the maternal-child attachment relationship without contextual influence. Such gaps in our understanding require longitudinal research utilizing multiple contexts and multiple measures of social competence.

In an eating episode, two aspects of interactive behavior are likely to be relevant to the development of social competence. The first is the *affective* dimension, which involves the mother's and child's manifestations of adaptive, synchronous and reciprocal

responsiveness and pleasure with the interaction. The second aspect concerns *sharing control* or the *balancing of interactive power* between mother and child. These two aspects are used to classify mothers' interactive behavior. It is hypothesized that mothers who exhibit engaged patterns of interactive behaviors will have children who also exhibit engaged patterns, thus leading to the development of social competence during toddlerhood and beyond.

Matched affect

The *affective* dimension may be observed in the affective or emotional responses between mother and child. Emotions, transmitted through facial expressions, voice tones, moods and response levels, form a dialogue of affective responsiveness (Denham, 1993). Beginning as sequences of stimulus-and-response interactions (Sander, 1976), coordinated and reciprocal exchanges provide the basis for mutually satisfying mother-child communications (Robinson, Little & Biringen, 1993). Such interactions convey a quality of connectedness between mother and child, an engaged pattern of interaction which is characterized by acceptance, pleasure and expectancy regarding the other's response (Sander, 1976). Early in infancy, mothers tend to respond by sharing the child's affect, accentuating and exaggerating the displayed emotion (Stern, 1985). As the child moves into toddlerhood, the mother tends to match the child's affect as a shared emotional tone (Stern, 1985). It may be that initially, sharing affect serves to gain attention and engage the child so to link affect with context and interpersonal connectedness. Sharing an emotional tone later in toddlerhood may serve to further the child's understandings about the social norms for conveying emotions, such as empathy.

This emotional dialogue is associated with the regulation of dyadic affect (Robinson, Little & Biringen, 1993) and the socialization of child emotions (Goldberg, MacKay-Soroka & Rochester, 1994). It has been found to predict child internalization of maternal values (Koshanska & Aksan, 1995; Lay, Waters & Park, 1989) and coping ability when mother is absent (Denham, 1993). Mother's warmth and emotional expressiveness, contingent responses to children's emotions and self reports of positive affective traits predicted children's emotional competence with preschool peers (Denham & Grout, 1993). Such findings suggest that children model maternal interactive behaviors in their interactions with other children. Thus, the affective dimension of interactive experiences is likely to affect the child's understandings and expectations of social interactions as well as behaviors within social exchanges.

Such studies point to the importance of positive, affective maternal behaviors and contingent responsiveness for expressions of social competence during toddlerhood. Since eating episodes provide ongoing social experiences for young children, maternal behavior during such interactions influences the child's early social experiences and their related social behaviors. The central dimensions of maternal behavior during an eating episode are likely her positive, affectionate behavioral tone and contingent responsiveness. Since the mother serves as a social reference during toddlerhood, it is expected that child's affective behavior will match that of the mother's. Additionally, as self-initiated behaviors have developmental salience during toddlerhood, the child's positive tone of assertions towards mother and responses to mother-initiated topics likely signify the advent of social behaviors. Thus, during an eating episode, mother's positive

affect is expected to be related to engaged patterns of mother-toddler interactive behaviors, engagement quality and child's positive affect during snack and to influence the child's social competence throughout toddlerhood.

Shared control

Shared control, or balance of interactive power, is also reflected in mother-child interactions around eating. Over the first year, there is a shift from the mother to leading the interaction, both eliciting and sustaining interactions, to the child initiating self-assertions with the mother (Sander, 1976). The child seeks experiences in controlling positive and effective interactions, which are provided as the mother complies with child requests or follows child initiations (Dumas, Serketich, & LaFrenier, 1995). Sharing control requires both mother and child to actively initiate and passively follow (Dumas, et a., 1995; Sander, 1976). Thus, shared control within a given dyadic interaction reflects symmetry and synchrony between maternal directiveness (behavior that structures child actions) and child autonomy (child initiatives). Difficulties negotiating a balance are readily apparent around food, a common and consistent mother-toddler interaction, as both mother and toddler may struggle for control and resist following the other's initiatives.

Interactive control has been related to variations in parenting styles (Baumrind, 1967), child autonomy during play (Houck, 1991), child compliance (Crockenberg & Littman, 1990; LeCuyer, 1996), peer relationships (Dumas, et al., 1995) and childhood eating patterns (Johnson & Birch, 1994; Valtolin & Ragazzoni, 1995). It is likely that early experiences of interactive control influence the child's understanding of social

situations and subsequent interactive behaviors. Thus, maternal control is thought to be inversely related to engaged patterns of mother-child interactive behavior during an eating episode and the child's social competence throughout toddlerhood.

Child temperament styles are likely to influence the child's response the balance of interactive power. Children with easy temperaments, who tend to respond with less intensity, are expected to adapt to maternal control; children with difficult temperaments are expected to resist maternal control and manifest less compliance and responsiveness to maternal initiations. However, it is likely that mothers adapt behaviorally to child temperament difficulty by structuring interactions around food so to provide the child with more interactive control.

Conceptual Framework

This investigation conceptualized the development of social competence as an outcome of mother-toddler interactions. The child was thought to develop social interactive patterns through social experiences with mother, which the child then carried forward to social interactions with others. Early social behaviors have an ongoing developmental importance, as incompetent social behaviors during toddlerhood, manifested as behavior problems, are stable throughout early childhood and is associated with problems in adolescence. Social incompetence during toddlerhood was assumed to reflect a continual malfunction in the child's significant social interactions, specifically, those with mother. Unsupportive maternal behaviors, such as those which limit the child's autonomy and diminish opportunities for mother-child engagement, were thought to exert a negative influence on their child's social development. Furthermore, it is likely

that the negative influence of difficult child temperament was mediated by supportive maternal interactive qualities.

Mealtimes are significant social experiences for the young child, as this context provides the young child with consistent and predictable opportunities for mother-toddler social experiences. The central dimensions of maternal behavior during an eating episode were identified as a positive, affectionate behavioral tone and contingent responsiveness; the key dimensions of child behavior were identified as a positive tone of assertions towards mother and responsiveness to mother-initiated topics. An observational coding system, the Snack Scale, was developed to assess the quality of maternal-toddler interactions throughout toddlerhood.

The purpose of this study was to examine the reliability and validity of the Snack Scale and to examined the influence of temperament on social behaviors as manifested longitudinally with mother during eating. It was expected that the interactive patterns would evidence ongoing importance throughout toddlerhood, although the salient maternal and child behaviors would change in relation to the child's developmental competence. Additionally, it was expected that maternal behavior style would mediate the influence of temperament difficulty on the child's social competence.

Specific Aims

In this study, the conceptualization and measurement of mother-child interactive behavior during an eating episode was examined at 12, 24 and 36 months. The specific aims were

1) to refine the Snack Scale for assessing the nature of mother-child interactive behavior during an eating episode and to examine its reliability and stability across toddlerhood;

2) to obtain evidence for construct validity of the Snack Scale

a) by examining the associations between the Snack Scale and other observational scales measuring similar concepts; and

b) by examining how mother-child interactive behavior during an eating episode contributed to explaining variations in social competence at 12, 24, and 36 months;

3) to explore how child temperament is associated with mother-child interactive behavior during eating episodes, and

4) to explore how temperament and mother-child interactions jointly were associated with social competence.

CHAPTER III

METHODS

This study examined social competence as an outcome of mother-toddler interactions. A new coding system, the Snack Scale, was developed to assess mother-toddler social interactions during an eating episode at the child's age of 12, 24 and 36 months. The Snack Scale was used to code video-taped observations of 126 mother-toddler dyads during snack at the three age periods. The validity of the new coding system was examined in relation to measures that assessed similar mother-toddler interactive concepts. Child temperament scores were also assessed in relation to mother-toddler interactions, considering their separate and combined influences on the development of social competence during toddlerhood.

The data used in the present study were collected in a larger observational study examining the influence of control-salient interactions on the development of children's self esteem at 12, 24 and 36 months of age (Houck, 1997). This sample consisted of 162 middle- and lower-income mother-infant dyads recruited from a Family Practice Clinic prior to the child's age of 8 months. Mothers having English as a primary language and their non-handicapped infants were included in the study. Data were collected from 153 dyads at 12 months, 135 dyads at 24 months, and 132 dyads at 36 months, with complete data sets collected from 78% ($\underline{N}$ = 126) of the original 8-month sample. No mothers directly refused to continue participation over the 3 years of data collection; attrition was due to inability to contact participants who had relocated without leaving a forwarding

address and/or disconnected their phones, or due to relocation of participants out of the area.

The Sample

The final sample was comprised of the 126 mother-toddler dyads in the larger study for whom complete data were available at all data collection periods, with the exception of one tool (NCATS) at 36 months. Power estimates were based on N = 126, alpha = .05 and a medium effect size (estimated $\underline{R^2}$ = .13 using Cohen's convention for estimating a moderate effect). This yielded an estimated power level of .83 for regression analysis with a maximum of seven predictor variables. The sample consisted of 40 girls and 86 boys and their mothers. Maternal characteristics are described in detail in Tables 1- 4. The majority of mothers reported themselves to be Caucasian (77%), one-sixth to be African American (16%) and a few reported themselves to belong to other ethnic groups (7%) (See Table 1). A greater proportion of the African Americans participated in the larger study (20%) than is reflected in the current sample. At entry into the study, mothers were aged 17- 47 years ($\underline{M}$ = 28.4, $\underline{SD}$ = 7.4) (Table 1) and were largely first- (49%) or second-time mothers (28%).

Mothers' level of education (Table 1) at entry into the study ranged from not completing high school (13%), to some college (28%), to college degrees (25%). As shown in Table 2, the majority of mothers (64%) reported themselves as married or partnered at intake. Although 24 reported a divorce or separation during the 2-1/2 years of data collection, relationships were relatively stable. Half of the mothers (53%) identified themselves as employed at 8 months, increasing slightly at every observation; see

Table 3. Maternal employment, defined as employed more than 20 hours per week, was stable from 31% at 8 months to 33% at 36 months. Consistent with employment rates, the use of daycare provided by a relative, family daycare or childcare center increased from 29% at 8 months to 38% at 36 months. At 8 months, reported income ranged from less than $15,000 (24%) to more than $30,000 (26%); income increased over the three years of data collection (Table 4).

Overall, this sample is representative of lower-risk Caucasian mothers. The mothers seem "typical" in that they were of moderate age and had moderate levels of education. Most of the mothers were married/partnered during their child's infancy, although approximately one-fifth of the mothers experienced difficult relationships with their partners at some point in their child's first three years. This sample also represented contemporary mothers in that many were employed throughout their child's early life, while others were "stay-at-home moms." It stands out that the mother's income levels were especially low during their child's first year, with one third of the mothers receiving public assistance -- also representative of the economic realities of many mothers.

Table 1
Descriptive Statistics: Maternal Race, Age and Education

Race		Age at Intake		Highest Grade Completed at Intake	
	n %	years	n %		n %
African American	20 (16%)	17 - 19	14 (11%)	Some High School	17 (13%)
Caucasian	97 (77%)	20 - 24	34 (27%)	High School	42 (33%)
African American/ Caucasian	3 (2%)	25 - 29	25 (20%)	Some College	35 (28%)
Caucasian/Hispanic	1 (1%)	30 - 35	25 (20%)	College	24 (19%)
Caucasian/Native American	2 (2%)	36 - 40	19 (15%)	College +	7 (6%)
Asian/Native American	1 (1%)	>41	7 (6%)	Business/Trade School	1 (1%)
missing data	1 (1%)	missing data	1 (1%)		

Table 2
Maternal Marital Status

	never married	common law	married	*without changes*	increase conflict	separated	divorce	reunite
8 mo. n=125	23 (19%)	12 (10%)	81 (64%)			3 (2%)	6 (5%)	
***CHANGES** in marital status over the three years*								
12 mo. n=124		4 (3%)	4 (3%)	107 (86%)	3 (2%)	5 (4%)		1 (1%)
24 mo. n=114		2 (2%)	4 (3%)	97 (85%)	6 (5%)	3 (3%)	1 (1%)	1 (1%)
36 mo. n=125		3 (2%)	1 (1%)	100 (80%)	6 (5%)	11 (9%)	4 (3%)	

Table 3
Maternal Employment and Childcare Use

	8 months n = 125	24 months (n = 124)	36 months (n = 125)
reported self as employed	67 (53%)	77 (61%)	79 (62%)
hours worked per week			
4 - 12	5 (4%)	10 (8%)	9 (7%)
13 - 20	17 (13%)	40 (32%)	22 (17%)
21 - 30	8 (6%)	2 (2%)	6 (5%)
31 - 40	31 (25%)	38 (30%)	35 (28%)
use of day care	39 (31%)	data not collected	48 (38%)

Table 4
Annual Household Income

gross annual income	**8 months (n = 125)**	**24 months (n = 122)**	**36 months (n = 125)**
< 5,000	15 (12%)	8 (6%)	7 (6%)
$5,000 < 14,999	36 (29%)	29 (23%)	24 (19%)
15,000 < 23,999	30 (24%)	27 (21%)	33 (26%)
24,000 < 32,999	15 (12 %)	17 (13%)	15 (12%)
> 33,000	29 (23%)	41 (33%)	46 (37%)
income decrease over past year	24 (19%)	19 (15%)	24 (19%)
recipient of direct public assistance	43 (34%)	31 (25%)	30 (24%)

Data Collection Procedures

The larger study was approved by OHSU's Institutional Review Board and a signed consent was obtained from each mother prior to participation in the study. Mother and child characteristics were assessed at the child's age of 8 months, with subsequent

assessments of characteristics and laboratory observations of the dyads at the child's age of 12, 24 and 36 months. Data were collected using eight maternal report measures, which were mailed to mothers prior to a scheduled observation. Observations of mother-child interactions were videotaped at the OHSU School of Nursing and consisted of seven episodes (Table 5), which varied in sequence according to the age of the child. At 12 months, the observation began with the ball playing transition, followed by child solitary play, mother-child play, the teaching episode, toy clean-up, and the limit-setting episode; the snack period then took place and the sequence concluded with the self/other agency tasks administered by the investigator or research assistant. The sequence was modified at 24 and 36 months, as the observation began with the administration of the agency tasks, followed by a mother-child snack period, mother-child ball playing transition, a mother-child teaching episode, a limit-setting episode, a solitary play period (mother in room but unavailable for play), a mother-child play period and toy cleanup.

Table 5
Observation sequence for mother-child interactions at 24 and 36 months

Self-Mother Knowledge Task: examiner-directed assessment of the child's understandings about the self and the mother.	30 minutes
Snack: peanut butter Ritz-bits, saltine crackers, Teddy grahams, a slice of cheese and juice (a small cup for child and a larger glass for mom). eaten with child at child-sized table: "Let's take a break for a snack but I'll keep the camera running. Let's break for 10 minutes or until you're finished eating."	10 minutes
Roll-the-ball: mother-child free play with a 12-inch ball: "Here's a ball for the two of you to play with."	3 minutes
Teaching Task: mother teaches a specified task to the child (stacking wooden blocks at 12 mo; zipping and buttoning at 24 mo; drawing a circle, line and square at 36 mo): "Please teach your child how to.... it's not important that the task is completed, just let me know when you're finished."	5 minutes
Prohibition Sequence: mother is requested to keep child from touching a specified toy: "Please do whatever you would usually do to keep your child from touching this toy."	3 minutes
Child only Free Play: mother is given magazines to read while child plays with toys arranged in a semi-circle on the floor: "Please read these magazines while your child plays. It's OK if you respond to your child if you are asked a question or your child is upset, but please don't initiate any interactions."	3 minutes
Mother-Child Play: mother and child play together: "Now please get down on the floor and play with him/her, just like if you had some free time at home."	6 minutes
Clean-up Toys: examiner brings in a basket: "Now it is almost time to go. Please put the toys away in here."	3 minutes

Measures

Measures used in the present study assessed mother-child interactions, child temperament and child social competence. Observational data were collected during mother-toddler episodes of snack, play, and teaching which were coded, respectively,

with the Snack Scale, the Control-Autonomy Balance Scale, the Nursing Child Assessment Teaching Scale and the Nursing Child Assessment Feeding Scale (at 12 months only). The three dyadic interactive episodes reflect commonly occurring, unstructured social situations of eating, play and teaching/learning. Data collected in the larger study at the child's age of 12, 24 and 36 months included mothers' reports of child behavior assessed with the Toddler Temperament Scale and Adaptive Social Behavioral Inventory. Although the reliability of maternal reports has been debated, mothers are thought to be in the best position to report on child behavior across a range of situations (Houlin, Fullard & Heverly, 1989). Descriptions of each measure and its reliability and validity follows.

Measures of Mother-Toddler Interaction

Snack. The Snack Scale (Houck & Spegman, 1999) (Appendix A) was designed to assess mother-child interactive patterns during a snack situation. The coding system classified mothers on the basis of their engagement and control during the snack interaction and children according to their engagement and autonomy. It was intended to tap the quality of these dimensions as they were manifested in two components of a snack setting: 1) the extent to which the child and mother were engaged and connected, as reflected in their verbal conversation and enjoyment with each other, and 2) the negotiation of feeding/eating the snack and the extent to which the mother facilitated (vs. controlled) the child's autonomy throughout the snack episode.

The coding system was developed for videotaped observations of mothers and their toddler child during a snack period. Accordingly, the snack setting was altered to

accommodate the child's growing capacities. At 12 months, a high chair was brought into the observational laboratory; all mothers placed their infants in the high chair. The mothers then either placed snack items on the high chair tray for the child to eat/drink, gave the items to the child, or fed the child. At 24 and 36 months, a child-sized table and chairs were in the observation room. The tray of snack foods was placed on the table, positioned between the mother and the child. At 24 and 36 months, the only other furniture in the room was a chair (used by the mother at 12 months), a lamp table with a lamp, and a floor lamp; there were no toys or other play items available to the child. Videotaping was carried out through a one-way mirror in the laboratory setting. At every age, the mother was instructed by the researcher, when bringing in the snack tray, that this task was a "break" for them but that the camera would continue to record. The mother was told to inform the researcher when they were finished and that the researcher would check back with her in 10 minutes. No other instructions were provided. The snack situation was terminated when 1) the mother signaled before 10 minutes (rare), 2) when the researcher entered the lab after 10 minutes, or 3) when the mother indicated the completion of the segment after the 10-minute check. The snack coding scheme was developed for the first 3 minutes of the videotaped interaction. The 3-minute coding period commenced when the infant was in the high chair and either the mother offered the first food item or the child made the first bid for food. At 24 and 36 months, coding began when the examiner left the room.

The Snack Scale consists of three components: a) maternal and child behavioral classifications; b) a rating of dyadic mutuality; and c) maternal and child affect ratings.

The emphasis in this coding scheme was twofold. First, the scale focused on the nature and amount of child assertions in relation to maternal facilitation and inhibition of such autonomy (control). The balance between these behaviors is manifested in the mother and child's social conversation as well as in the negotiation and coordination of feeding/eating the snack. Second, there was a concern for the nature and amount of engagement or connectedness and enjoyment displayed by the mother and child, again evidenced primarily in their social conversation throughout the snack episode.

The first part of the coding system is the most extensive as the others are global ratings. The assignment of behavioral classifications uses frequency counts of verbal and nonverbal behaviors indicating autonomy/control and engagement. The behavioral frequencies are assessed as proportions of behaviors (i.e., mother behavior in relation to other mother behaviors and mother behavior in relation to child behaviors) (See the Snack Scale Coding Manual for a compete list of behavioral proportions). The classification serves as a description of the individual's style of interactive behavior in relation to that of the dyadic partner's. The frequencies and proportions are used in combination with more qualitative or clinical judgements about the quality and pacing of behaviors. Thus, the frequencies and proportions are intended to enhance the rigor of the behavioral classification but not to absolutely determine them. The addition of clinical judgement is essential for determining qualitative differences.

Behavior codes. Verbal and nonverbal behaviors are coded as child autonomy (self-directed v. other-directed), child follow, mother direct (autonomy facilitating v. behavior controlling), and mother follow. Actual frequency counts of these behaviors

were made throughout the 3-minute taped snack observation, and were entered into columns on the coding form. Behaviors are counted when the topic changes rather than within topics. The coding form and complete descriptions of the behavior codes and behavioral examples are found in the Snack Scale Coding Manual (Appendix A). Descriptive data for the behavior frequencies are presented in Table 6.

Table 6
Descriptive Statistics for Behavioral Frequencies for 3 Minutes of the Snack Interaction at 12, 24, and 36 Months

Behavioral variables		12 Months (N = 121)	24 Months (N = 126)	36 Months (N = 126)
Child behaviors				
Self-directed autonomy	Range	3 - 16	3 - 20	1 - 19
	M	8.56	8.30	8.72
	S.D.	2.86	2.77	3.13
Other-directed autonomy	Range	0 - 11	0 - 15	0 - 16
	M	3.74	5.35	7.05
	S.D.	2.60	2.82	3.08
Follow	Range	1 - 10	0 - 13	0 - 18
	M	5.18	5.30	7.46
	S.D.	2.02	2.45	2.67
Mother Behaviors				
Facilitative directs	Range	1 - 12	2 - 17	1 - 18
	M	5.52	6.17	6.60
	S.D.	2.18	2.73	2.80
Controlling directs	Range	0 - 14	0 - 24	0 - 12
	M	3.04	2.75	1.98
	S.D.	2.79	3.00	2.24
Verbal Follows	Range	1 - 14	0 - 17	2 - 15
	M	5.70	5.98	8.23
	S.D.	2.81	2.70	2.69
Behavioral follows	Range	0 - 5	0 - 6	0 - 4
	M	0.90	1.28	0.75
	S.D.	1.17	1.18	1.00

Child autonomy describes manifestations of the child's self assertions during the snack interaction. Such behaviors include both verbalizations and nonverbal behaviors that are independent of the mother's verbalizations or behavioral actions; that is, child autonomy is not contingently responsive to maternal verbal behavior. Self-assertions are

coded as *self-directed autonomy or other-directed autonomy*. Self-directed autonomy refers to verbal and nonverbal behaviors that are self-occupied, contained way that excludes or ignores the mother and does not carry intents to communicate to the mother nor expectations for her response. Other-directed autonomy refers to behaviors in which the child's agenda is conveyed to the mother and includes verbal and nonverbal behaviors that indicate a need, preference or choice as well as child initiations of actions or conversation topics. Such behaviors suggest an expectancy for the mother's response.

Child behavior that follows or adopts the mother's topic, activity, or direction is counted as *child follow*. Following the mother's topic is usually observed in the conversation but may also be evidenced through the child's behaviors. Verbal following is related to language skills. At 12 months, this may be in the form of imitating vocal sounds or efforts to repeat words and at 36 months, the child's responsiveness should be clear. There is no "delayed" following. Child follow must be contingent to the mother's behavior and "on topic."

Maternal directive behaviors include maternal actions which change topics or maintain those which she had previously introduced. Such behaviors may be observed verbally and nonverbally or behaviorally, and are characterized in two ways: *autonomy facilitating* and *behavior controlling*. Facilitating directs include maternal verbalizations that carry an intention to socialize and teach rather than control, and includes social conversation, initiations of social conversation, or introducing any topic of conversation. Voice tone is crucial to distinguishing between facilitating and controlling verbal directs; those that are positive and instructive or "teaching" in tone are more socially facilitating

whereas those that carry a negative tone are more likely to be behavior controlling. Nonverbal facilitating directs describes behavior that assists the child's developing autonomy, especially around eating.

Behavior controlling directs are maternal behaviors that constrain the behavior of the child; the mother expects compliance. Such behaviors can be directions or corrections following child autonomy (initiations), whether the child's autonomy was self-directed or other directed and verbal or behavioral. Thus, although the mother may appear to be following a topic initiated by the child, she is directing a change in the child's agenda. Voice tone carries a fair amount of weight in determining whether maternal utterances are coded as facilitating vs. behavior controlling. Nonverbal behavior controlling directs constrain the child's behavior and/or autonomy, especially with respect to eating/drinking.

Maternal verbal follow and *behavioral follow* are contingent responses to the child's assertions (i.e., requests, behavioral cues, or expressions). Maternal verbal follows remain within the child's topic and intention, and refers to a pacing and timing of responsive behavior that allows for the child to continue or expand the topic. Verbal or nonverbal following serves to maintain, elaborate, or repeat the child's previous utterance, or to acknowledge, confirm or respond to a question, or to clarify. Verbal follows are often social in nature, more conversant responses to the child's agenda. Behavioral follow includes any nonverbal behavior that is contingently responsive to child cues, especially those autonomous cues around eating and social interaction.

The behavioral frequencies (See Table 6) show that children manifested a greater range of other-directed autonomy and following behavioral frequencies over time, while

mothers had higher frequencies of controlling directs, verbal follows and behavioral follows at 24 months. The mean frequency for any behavior varied differently over the three observations periods. The mean frequency of self-directed child autonomy was highest at 36 months and lowest at 24 months, while the means for other-directed autonomy and child follow increased in relation to the child's age. For mothers, facilitative directs decreased and controlling directs and verbal follows increased relation to the child's age, while the mean frequency of behavioral follows was highest at 24 months and lowest at 36 months. For children, the greatest variability in the behavioral frequencies was found at 36 months while no obvious pattern emerged with regard to the variability of maternal behavioral frequencies.

Maternal classifications. Maternal classifications were identified and developed on the basis of patterned behavior that reflected maternal engagement with her child and the nature of her directiveness. Maternal engagement was assessed in terms of the mother's perceptual awareness of and responsiveness to the child, including the child's developmental agenda. Directiveness was assessed not only in terms of its frequency in relation to all maternal behavior but with respect to what proportion of the directs were autonomy facilitating vs. behavior controlling. The proportions of behavior were used to assist in assigning the classifications but only in the context of the child's behavior and in light of interactional nuances and characteristics. The classifications are labeled facilitative engaged, controlling engaged, superficial and controlling disengaged.

A distinguishing feature of the *facilitative engaged* mother is her attentiveness to the child's developmental agenda for autonomous self-expression and mutual

engagement. This mother typically conveys a genuine interest in the child. Verbally, her following tends to extend and further develop child-initiated topics. She may "give words" to her interpretations of the child's behavior or voice the thoughts and intentions underlying her behaviors. The *controlling engaged* mother appears child-focused, however, the timing and pacing of her responsiveness to the child's self expression is rushed. This mother also appears insensitive to the child's disengagement cues, which contributes her missing the child's disengagement cues. Often such mothers try to elicit the child's attention or response irrespective of the child's interest or agenda. Mothers with a *superficial* interaction pattern display a pervasive lack of connection with her child.. In this pattern, the mother seems to be watching the child and "acting" the role of parent, and does not seem to have a genuine awareness of - or sensitivity to - the child's agenda or developmental needs. *Controlling disengaged mothers* appear disengaged from their child, with little interest in the child's agenda, and tend to manifest controlling behaviors. This mother seems unaware of her child's behaviors, cues and desires and rarely follows her child's efforts to engage her. Overall, this mother seems self-occupied. Complete definitions of the maternal classifications are contained in the Snack Scale Coding Manual (Appendix A).

Child classifications. Four classifications of child behavior were identified and developed according to how engaged the child was with the mother and the nature of the child's self-assertions. Engagement was assessed in terms of the child's perceptual awareness of and responsiveness to the mother and the verbal and behavioral connectedness between them. Self-assertions were assessed in terms of whether they were

other-directed (to the mother) or self-occupied, taking into account the child's level of aggression, protest, or other form of opposition for the sake of opposition. Behavioral proportions of child autonomy (in relation to all child behavior) and child follow (in relation to maternal facilitating and behavior controlling directs) were used to aid in the rigor of behavioral observation and classification but not to directly determine the classification. The child classifications are labeled engaged assertive, intermittent engaged, compliant disengaged and active disengaged.

The *engaged assertive* child's interactive behavior is characterized by engagement with the mother. The child is perceptually alert and responsive to the mother, maintains an ongoing awareness of her, and willingly follows the mother's topics or intentions. Assertions typically express feelings (excitement, frustration) and suggest an expectancy for maternal response. The child with an *intermittent engaged* pattern of behavior evidences bouts of perceptual awareness of, and responsiveness to, the mother along with bouts of verbal autonomy directed towards her. The child seems to wait and watch for opportunities to play or have fun with the mother and efforts to connect with her do not necessarily carry an expectancy for her response. The *compliant disengaged* child is distinguished by a lack of connectedness with the mother and passive following of her directives, with little self-assertion or social autonomy directed toward the mother. There is an absence of active resistance or refusal, thus the child appears to readily follow maternal directives. The *active disengaged* child is not oriented to the mother and appears to have limited perceptual awareness or responsiveness to her. Behaviors tend to be self-occupied in nature, excluding the mother rather than being asserted or expressed to her.

The few mother-directed initiations concern access to food and the few following behaviors are typically related to eating and often convey resistance, sometimes with force. Complete definitions of the child classifications are contained in the Snack Scale Coding Manual (Appendix A).

Mutuality ratings. The second component of the Snack Scale, the mutuality rating, is intended to provide an assessment of the quality of social connectedness, cooperation and negotiation in an eating context. The quality refers to how well each partner in the interaction responds to the other's behavioral cues in an adaptive, synchronous and reciprocal manner. The rating reflects the extent to which the goals around eating are negotiated, so that individual agendas are expressed, acknowledged, and followed.

The global ratings (1 = poor, 2 = some, and 3 = connected) describe the overall tone of the interaction. The lowest rating of poor is given when the dyad shows little awareness of each other's agenda, with minimal negotiation, shared goals or emotional/social connectedness. Eating activities may become the basis of conflict. There is a pervasive sense of disconnection throughout the eating episode. *Some mutuality* signifies a moderate level of cooperation and negotiation, as well as occasions in which the other's agenda is not acknowledged or joint goals are not negotiated. There is an imbalance in responsiveness, with one partner initiating or following the majority of interactions. In general, eating activities are in the foreground and reflect a tone of cooperation, but with some emotional or social disconnection. The *connected dyad* is predominantly engaged, so that agendas are shared, negotiated and followed. Both partners assert and follow, with eating activities in the background and social interactions

in the foreground. Thus, eating becomes a context for engagement rather than the focus of the interaction. Complete definitions of the mutuality ratings are contained in the coding manual in Appendix A.

Affect ratings. The third component of the scale is a global rating of mother and child affect (1 = negative, 2 = neutral, and 3 = positive). The mother and child are rated separately for the predominantly affective tone of the episode, to capture the overt behavior related to or arising from feelings toward the partner during the snack interaction. The *negative* affect rating (1) describes a predominant interactive tone that is as subdued, flat, or sober, with rare animation. It is also used to reflect anger, sadness, irritability, resistance, and/or negativity directed toward the partner. The rating of *neutral* (2) is given in the absence of a clear, overall or dominant polarized affect. This rating indicates that some negative and positive affect are manifested throughout the interaction, leaving uncertainty about a truly positive or truly negative tone. The positive rating (3) is assigned when the individual appears comfortable and content, or to be enjoying the interaction. Such affect is conveyed in voice tone, facial expressions and verbal expressiveness. Complete definitions of the affect ratings are in the coding manual in Appendix A.

Scale development. The Snack Scale was refined as the video tapes were coded at each observation period. This process continued until adequate interrater reliability was reached for the assignment of mother and child classifications and the mutuality and affect ratings. Such a process was necessary in order to identify the salient behaviors for each developmental level. The definitions of maternal categories were expected to reflect

the characteristic patterns by which the mother: 1) interacted with her child on a social level, 2) facilitated her child's autonomy, and 3) taught social norms around eating. However, the specific behaviors which characterized and differentiated the maternal classifications were thought to evolve as the mother accommodated child motor and cognitive development. Table 7 provides definitions of the four maternal classifications and the age-specific behaviors which exemplified the classifications.

Likewise, the specific behaviors supporting child classifications at each age (12, 24, and 36 months) also depended upon developmentally salient skills. The specific behaviors that characterized and differentiated the child classifications were also thought to evolve according to the child's ongoing psycho-motor development. In this way, child manifestations of autonomy and interactive abilities could be examined in relation to the maturation of cognitive, motor and verbal skills. Table 8 provides definitions of the four child classifications and the age-specific behaviors which exemplified the classifications.

Table 7

Descriptions of Mother Classification Groups and Related Age-specific Behaviors

Facilitative Engaged: nearly equivalent amounts of directive and following behaviors; primarily facilitative directs, many facilitative follows aware and responsive to child's cues and self assertions; conveys genuine interest in child and pleasure with interaction follows extend and further develop child-initiated topics; sensitive pacing and timing		
12 months: •directs focus on autonomy around eating •provides space for child to play and experiment •corrections are teaching-based •uses all modes to follow child's initiatives	24 months: •subtle structuring of snack •initiates conversation, both social and teaching- based •many facilitative and few nonverbal or behavioral follows	36 months: •facilitates so child can structure snack •directs serve to engage child in social conversation •follows serve to sustain conversation
Controlling Engaged: directs reflect mother's agenda and are fairly balanced with follows; conveys interest; attentive; voice is sensitive and enthusiastic; insensitivity to child's disengagement cues; "functional engagement," centers on child's compliance with maternal agenda; insensitive pacing and timing		
•several verbal and nonverbal controlling directs •follows may regard child's behavior in relation to maternal directive •primarily acknowledging and behavioral follows	•follows often exceeds child's other-directed autonomy •maternal structuring of snack •sense of hovering reflected in high number of maternal directs and follows	•high number of directs and follows •many conversation topics introduced, with less space available for child to initiate/expand topics •follows sometime sustain child-initiated topics
Superficial: more follows than directs, with rare controlling directs; responsive to overt cues and distress signals; initiates few social interactions but readily follows those initiated by child; watches child, "acting" role of parent conveys little genuine interest or enjoyment in interactions with child; sensitive voice although without enthusiasm or excitement		
•directs primarily non-verbal, facilitate autonomy; •follows primarily acknowledging or behavioral •provides little interpretation or feedback, overall quiet eating episode	•rarely or indirectly structures snack •follows primarily acknowledging or behavioral •provides rare interpretation or feedback about interaction	•directs = follows, with questions about snack •follows lack depth, but facilitates child's autonomy •makes little effort to initiate or sustain conversation
Controlling Disengaged: self-occupied: seemingly unaware of child's cues, behaviors, needs; behaviors reflect own agenda directs usually behavior-controlling, few following behaviors; attends to child without genuine interest in relating to the child; pervasive lack of connection;		
•many behavior and verbal controlling directs •snack episode contains little verbal conversation, with episodes of nonverbal interactions •interactions may be unpleasant with episodes of harsh interactions	•directs exceed follows •little verbal interaction, rare social conversation •attends to child with a superficial sense of watching/witnessing or harshly correcting	•directs may approximate follows •control issues surface, child may structure snack •directs do not facilitate child's autonomy; follows do not sustain conversation •may appear distracted or harsh and ignoring

Table 8

Descriptions of Child Classification Groups and Related Age-specific Behaviors

Engaged Assertive: readily asserts preference and needs; expresses choices; assertions suggest expectancy for maternal response; willingly follow's mother topics and intentions; resist are not prominent; introduces own topics of interest; interactive connectedness to mother, conveying an emotional enjoyment with interactions		
12 months: •nearly equivalent amounts of autonomy and follow •initiates playful social interactions •sensitive to mother's pacing	24 months: •introduces verbal and playful social topics •equivalent amount of self- and other directs •high other-directs and follows; often food related with some social	36 months: •initiates social and food-related topics •often emphasizes sharing food with mother •follows sustain conversation: prolonged episodes, fewer topics
Intermediate Engaged: bouts of interactiveness, with periods of non-interaction; ongoing perceptual awareness of mother - not ignoring; some social other-directed behavior; watchfulness for opportunities to engage with mother		
•sensitive to mother's pacing: adjusts other-directs in relation to space available for interaction •intermediate connectedness or efforts to connect	•assertions do not carry an expectation for response •higher self-directs in relation to follows •follows high in relation to mother's directives	•initiates some social conversations •some follows sustain conversation, some brief •may introduce many topics to engage mother
Compliant Disengaged: elements of ignoring; perceptual awareness of mother; absence of active resistance or refusal; passively follows directives little social autonomy directed towards mother; assertions typically related to food access		
•little autonomy around eating; little enthusiasm •rare other-directs •follows related to food, usually non-verbal	•rare social autonomy occurs late •autonomy low in relation to follows, esp. social •appears to monitor mother's behavior	•other-directs focus on eating activities/food •brief follows rarely sustain conversation •rare social other-direct occurs late
Active Disengaged: limited perceptual awareness and responsiveness to mother; eats as if alone; pervasively ignoring; no social autonomy; frequently ignores or actively resists maternal directs; self-occupied behaviors may be made with intensity; frequent disengagement cues		
•high self-directs; low other-directs and follows •more resistance than ignoring; resistance is active •few follows, related to food	•frequent self-occupying behaviors •follows are low in relation to maternal directs other-directs are related to accessing food	•verbal other-directs are related to eating or not contingent to social conversation •follows are brief responses; no apparent effort to sustain conversation

The four mother classifications were mutually exclusive as were the four child classification at each data period. Likewise, the ratings of dyadic mutuality, mother and child affect were mutually exclusive. The classifications of mother interactive behaviors were fairly evenly distributed across the four groups at every observation period, although the child classification of active disengaged was under-represented at 12 and 24 months (Table 9). Mothers tended to display more negative affect than did their children. Somewhat surprising to this researcher, more dyads manifested poor mutuality than were rated as connected.

The reliability of the Snack Scale was examined in accordance with the first aim. The validity of the scale was examined as described by the second aim. The results are presented in Chapter 4.

Table 9
Distribution of Mother and Child Classifications at the Child's Age of 12, 24 and 36 Months

		12 months	24 months	36 months
Mother Classification	facilitative engaged	24 (19%)	24 (19%)	25 (20%)
	controlling engaged	28 (22%)	38 (30%)	32 (25%)
	superficial	43 (34%)	38 (30%)	38 (30%)
	controlling disengaged	31 (25%)	26 (21%)	31 (25%)
Child Classification	engaged assertive	27 (21%)	27 (21%)	24 (19%)
	intermittently engaged	62 (49%)	51 (41%)	60 (48%)
	compliant disengaged	33 (26%)	27 (21%)	32 (25%)
	active disengaged	4 (3%)	21 (17%)	10 (8%)
Mutuality	poor	31 (25%)	39 (31%)	30 (24%)
	some	73 (58%)	61 (48%)	70 (56%)
	connected	22 (18%)	26 (21%)	26 (21%)
Mother Affect	negative	19 (15%)	34 (27%)	34 (27%)
	neutral	60 (48%)	64 (51%)	59 (47%)
	positive	47 (37%)	28 (22%)	33 (26%)
Child Affect	negative	23 (18%)	34 (27%)	9 (7%)
	neutral	67 (53%)	55 (44%)	59 (47%)
	positive	36 (29%)	40 (29%)	58 (46%)

Play. The Control-Autonomy Balance Scale (CABS) (Booth & Houck, 1985) (Appendix B) is an observation scale which assesses the quality of dyadic negotiation and coordination during mother-child free play. The coding scheme consists of three components. First, the coding system classifies dyads on the basis of maternal directiveness, sensitivity and contingency and child autonomy and engagement. The frequencies and proportions of initiation and following behaviors are used to examine the

structure and process of the play interactions and to describe the individual's interaction style in relation to their partner (Houck, 1987). The scale identifies four classifications of mother behavior: sensitive-nondirective, sensitive-directive, controlling-directive and intrusive; and four classifications of child behavior: engaged-nonautonomous, engaged-autonomous, avoidant-compliant, and ignoring. The mother and child classifications are used to identify four dyadic interaction styles: sensitive-engaged, sensitive/directive-engaged, controlling-avoidant compliant, and controlling-ignoring. A second aspect of the scale involves a global rating of the dyadic fit, reflecting the extent to which the dyad is mutually adaptive in play (1 = poor to 3 = mutual engagement). The third component of the scale is a global rating of maternal and child affect (1 = negative to 3 = positive).

Reliability of the CABS was examined with a sample of 32 dyads at the child's age of 13 and 20 months. Inter-observer reliability for the classifications, dyadic fit and affect ratings were good when measured using kappa coefficients ($\underline{k}$ = .69-.83 at 13 months; $\underline{k}$ = .65-.91 at 20 months). Construct validity was established using the Nursing Child Assessment Teaching Scale, the Nursing Child Assessment Feeding Scale, and the Child-Adult Relationship Experimental Index (Houck et al, 1991). Predictive validity was established between classification ratings at 13 months and subsequent attachment types and security ratings (Booth & Houck, 1987).

In the larger study, interrater reliability of the classification and dyadic fit ratings was adequate, with kappa coefficients ranging from .78-.80 at 12 months, .88-.98 at 24 months, and .90-.95 at 36 months. (Houck, 1997). The classifications were significantly stable from 12-24 months (mother: χ^2 ($\underline{df}$ = 9) = 46.84, child χ^2 ($\underline{df}$ = 9) = 37.26, $p \leq .000$)

.000) and 24-36 months (mother: χ^2 (df = 9) = 0.73, child χ^2 (df = 9) = 31.41, p ≤ .000) (Houck 1997) although the ratings were less stable between 12-36 months (mother: χ^2 (df = 9 = 46.84, p ≤ .004; child $\chi 2$ (df = 9) = 37.26, p ≤ .390). The Snack Scale and the CABS assess the dimensions of maternal directiveness, contingent responsiveness and child autonomy and engagement. Since play represents another arena for social development, the CABS was used to establish construct validity of the Snack Scale.

Teaching. The Nursing Child Assessment Teaching Scale (NCATS) (Sumner & Spietz. 1994) (Appendix C) assesses the quality of mother-child interactions in a brief teaching episode. It consists of 73 observable items scored on a binary scale to yield a total score, a maternal score, and a child score. Dyadic interactive quality is reflected in higher total scores. Subscales reflect the quality of maternal sensitivity, response to distress, socio-emotional growth fostering and cognitive growth fostering behaviors and the child's clarity of cues and responsiveness to the mother. The tool yields a total parent score, total child score and an overall (dyadic) total score. Parent and child contingency scores may be calculated by summing specific items assessing contingent responses to the interaction partner. It is normed for children up to three years of age. The NCATS is the one tool for which a complete data set is available only at the 12 month observation period. At 24 months, NCATS scores are available for 114 dyads: 5 dyads could not be scored as no teaching occurred during the allotted time period, the rater was unable to score another dyad who conversed in Spanish, and 6 dyads were not scored for unknown reasons. At 36 months, NCATS scores are available for 106 dyads.

Tool development occurred in the 1970's. Originally a 7-point rating scale, the scores were clustered to describe distinct aspects of the interaction (Sumner & Spietz, 1994). These scales were longitudinally tested with 193 mother-infant dyads from the child's age of 1- 36 months (Sumner & Spietz, 1994). Revised in 1979 to its present format, the observational checklist is used in clinical practice and research. Raters' reliability for research purposes is established using a database of cases double-coded to 90% agreement. In 1994, Sumner and Spietz reported that the database sample of 2100 was composed of Caucasian (n =1146; 54%), African-American (n = 569; 27%) and Hispanic (n = 408; 19%) mothers. The majority of mothers were married (77%), had a high school education (>80%), and were 27 years old, on average, at time of the NCATS observation (Sumner & Spietz, 1994). The average age of the children in the database sample was 15.5 months, 48% of whom were first-born; 52% were boys (Sumner & Spietz, 1994). No data are available concerning the socio-economic status of the database cases.

The internal consistency coefficients for the total scale (dyad, α = .87) and subscale scores are high (parent, α = .87; child, α = .81); as are the alpha coefficients for the contingency scores (parent, α =.82; child, α = .76) (Sumner & Spietz, 1994). This study's sample of 126 mother-toddler dyads reflected comparable coefficients at all ages, with the exception of the alpha coefficient for caregiver contingency at the child's age of 24 months and for infant total and contingency at 36 months (Table 10). The smaller subscales of both samples showed considerable variability in the alphas, likely due to the

smaller number of items involved. Thus, several of the subscales are not viewed as reliable for group comparisons (Sumner & Spietz, 1994).

Table 10
Internal Consistency Coefficients for the NCATS Dyadic Scores, Parent and Child Scales and Smaller Subscale Scores, Comparing the NCATS Reliability Sample with the Longitudinal Mother-toddler Study

NCATS scale component	NCATS reliability data	This study's sample		
		child's age of 12 months (N = 126)	child's age of 24 months (N = 114)	child's age of 36 months (N = 106)
Dyadic scores				
dyadic total score	.87	.80	.79	.69
dyadic contingency total		.75	.68	.66
Caregiver scales				
caregiver total	.87	.74	.64	.74
caregiver contingency	.82	.70	.49	.72
Caregiver smaller subscales				
sensitivity	.52	.19	.19	.26
responsiveness	.80	.48	.49	.78
socio-emotional growth fostering	.58	.11	.36	.31
cognitive growth- fostering	.78	.66	.46	.53
Child scales				
child total	.81	.79	.81	.58
child contingency	.76	.68	.77	.45
Child smaller subscales				
clarity	.50	.43	.32	.17
responsiveness	.78	.74	.80	.49

Stability, reported as a generalizability coefficient over 1, 4, 8 and 12 months, is $\underline{\delta} = .85$ for the caregiver and $\underline{\delta} = .55$ for the infant (Sumner & Spietz, 1994). The stability

coefficients for the present study's sample, calculated over 1- and 2- year intervals, were limited for both the mother (r = .26, 12-24 months; r = .17, 24-36 months; r = .21, 12-36 months) and the child r = .07, 12-24 months; r = .18, 24-36 months; r = .11, 12-36 months). The stability coefficients for the total score were also low (r = .05, 12-24 months; r = .20, 24-36 months; r = .15, 12-36 months). Likewise, the stability coefficients for the maternal contingency score were low (r = .05, 12-24 months; r = .15, 24-36 months; r = .15, 12-36 months) as were those for the child (r = -.13, 12-24 months; r = .10, 24-36 months; r = .06, 12-36 months) and dyad (r = -.006, 12-24 months; r = .20, 24-36 months; r = .12, 12-36 months).

Concurrent, predictive and discriminant validity has been complied by Sumner and Spietz (1994) Concurrent validity of the NCATS has been established with the Home Observation Measure of the Environment (HOME) (rs = .46 and .61, parent total; rs = .48 and .41, dyadic total at 13-24 months and 24-36 months, respectively). Predictive validity was established with the Bayley Mental Development Index (BMDI), the Ainsworth Attachment Security Scale, the Preschool Language Scale (PLS) at 36 months and the Wechsler Preschool and Primary Scale of Intelligence-Revised (WPPSI) at 60 months. NCATS scores at 1- and 4- month predicted 36-month expressive language scores as measured with the BMDI (rs = .71 and .76, respectively); scores at 10-months predicted BMDI total scores at 24 months (r = .37, parent total; r = .34, dyadic total). NCATS scores at 3 months predicted Ainsworth Attachment Security Scale scores at 13 months (r = .18, total parent; r = .26, total child; r = .27, dyadic total). NCATS scores at 12 and 24 months predicted scores on the PLS at 36 months (rs = .48 and .46, parent total;

(rs = .37 and .44, dyadic total, respectively). Additionally, NCATS scores at 12 and 24 months predicted scores on the WPPSI- IQ at 60 months (rs = .49 and .55, parent total; rs = .33 and .40, dyadic total, respectively). Discriminant validity has been established through research samples of substance abusing mothers, abusing mothers and multi-problem families (Sumner & Spietz, 1994). The 12, 24, and 36 month NCATS scores from the larger study were used to examine construct validity for the Snack Scale. In light of the lack of stability data for the reliability sample and the low stability coefficients for this study's sample, the NCATS measures were used to examine only the validity of the Snack Scale for specific observation periods (i.e., concurrent examination of validity) versus validity over time. Since the NCATS observational checklist measures the presence or absence of discrete behaviors, the lack of stability of the NCATS data over 1- and 2-year intervals may be due to actual changes in maternal and child behaviors. The NCATS seemed inappropriate for assessing the validity of the Snack Scale over time, since the Snack Scale was designed to assess patterns of interactions -- which were expected to have greater stability than discrete behaviors, and the NCATS assessed specific behaviors -- which are less likely to remain stable throughout the child's development and maturational processes. However, as teaching and snack are part of the day-to-day experiences of young children and both interactive episodes tap dimensions of maternal sensitivity, socio-emotional growth fostering, and dyadic responsiveness, the NCATS was deemed appropriate to examine the Snack Scale validity on a concurrent basis.

Maternal Report: Child Measures

Temperament difficulty. The Toddler Temperament Scale (TTS) (Fullard, McDevitt & Carey, 1984) (Appendix D) was used to assess the child's characteristic responses to environmental stimuli. Development of the TTS was based on nine dimensions of temperament derived through parental interviews. The dimensions were used to construct the Infant Temperament Scale (Carey & McDevitt, 1978) and the TTS, as well as two additional scales which assess temperament throughout childhood (Carey, 1985).

The TTS consists of 97 descriptions of child behaviors, each rated on a 6-point scale (1= almost never to 6 = almost always) to indicate the frequency with which the behavior is demonstrated. The items reflect the nine temperament dimensions: activity, rhythmicity, adaptability, approach, threshold, mood, intensity, distractibility, and persistence. Scores for each subscale are calculated as the mean of the nonmissing items (reflecting the number of completed items). The dimensions are used to arrive at the cluster categories of easy, intermediate, slow-to-warm up, or difficult temperament, which are differentiated according to the dimension scores. The easy temperament child is rated as rhythmic, high approach and adaptability, low intensity, and positive mood; the difficult child is rated as arrhythmic, low in approach and adaptability, intense, and negative in mood; the slow-to-warm up child is low in activity, approach and adaptability, mild in intensity negative in mood, and variable in rhythmicity (Fullard, et al., 1984). The scale also identifies an intermediate-high temperament (towards the difficult cluster) and a low-intermediate group (towards the easy cluster). The present study used the

temperament categories identified in Houck's larger study, which combined the three intermediate clusters and the slow-to-warm up group into one "intermediate" cluster. Thus, three temperament categories are identifies: easy, intermediate and difficult. The composite measure of temperament difficulty is calculated using the mean scores of five dimensions: approach, activity, intensity, mood and adaptability. Higher scores reflect greater temperament difficulty.

The TTS was standardized with 309 toddlers from 12-23 months of age ($\underline{n}$ = 167) and 24-36 months of age ($\underline{n}$ =142), described as primarily Caucasian and middle and upper class (Fullard, et al., 1984). Internal consistency of the nine dimension subscales ranged from .59 (threshold) to .86 (approach) with a median of .70 for 1-2 year olds; the consistency coefficients for the 2-year olds ranged from .63 (mood) to .85 (approach) with a median score of .72 (Fullard, et al., 1984). Similar median coefficients were found in the larger study: .61 at 12 months; .77 at 24 months; .84 at 36 months. (Houck, 1997). The internal consistency of the difficulty composite measure was recently reported to be .81 for a large (N = 1,153) national daycare study (NICHD Early Child Care Research Network, 1997). For the present sample, alpha coefficients were .77 at 12 months, .77 at 24 months, and .85 at 36 months.

Test-retest reliability at one month (n = 47) ranged from .69 (distractibility) to .89 (approach) with a median of .81 (Fullard, et al., 1984). In this sample, stability was found to be larger over 1- year intervals ($\underline{r}$ = .57, 12 - 24 months and $\underline{r}$ = from .65; 24 - 36 months) than over a 2-year interval ($\underline{r}$ = .40, 12-24 months). Concurrent validity was originally established using the Bayley Infant Behavior Record (Fullard, et al., 1984).

Mothers' ratings of child behavior using the TTS, considered to be an objective measure of toddler temperament, correlated with their subjective, global impressions of toddler temperament (r =.54, p<.001) (Houlin, et al., 1989).

The Toddler Temperament Scale was used to assess temperament at 12, 24 and 36 months of age. The descriptive data for this measure is presented in Table 11. The temperament difficulty score at each age served as a predictor/covariant in the analysis.

Table 11
Descriptive Data for the Toddler Temperament Scale Measures at 12, 24 and 36 Months

Temperament variables:		**Categorical Variable: Temperament Category**		
Categorical Temperament Cluster and Continuous Temperament Difficulty Score		easy	intermediate/ slow-to-warm up	difficult
12 months	**Temperament category**			
	Cell size	36	80	10
	Temperament difficulty score	17.86	19.99	22.46
	Range	14.7 - 20.2	15.7 - 25.9	20.0 - 25.4
	S.D.	1.55	1.86	1.78
24 months	**Temperament category**			
	Cell size	22	66	38
	Temperament difficulty score	18.21	21.52	22.37
	Range	15.3 - 21.5	15.0 - 24.4	20.2 -24.8
	S.D.	1.40	1.88	1.26
36 months	**Temperament category**			
	Cell size	23	71	32
	Temperament difficulty score	16.55	19.34	22.33
	Range	11.1 - 19.2	13.9 - 23.5	19.5 - 25.7
	S.D.	2.05	1.92	1.59

Social Competence. The Adaptive Social Behavior Inventory (ASBI) (Scott & Hogan, 1987) (Appendix E) was used to assess the development of social competence in

toddlers. Whereas the TTS focuses on the child's responses to environmental stimuli, the ASBI examines the child's responses to interpersonal stimuli in social settings. The scale profiles social skills and problems simultaneously by assessing a range of behaviors, emotions and social knowledge which are relevant to home, family and neighborhood settings. The measure assesses social behavior with adults as well as peers. The ASBI consists of 30 social behavior items that mothers rate on a scale of 1 (never) to 3 (often) to reflect the frequency with which her child manifests the behavior. A higher score reflects more adaptive social behavior. Factor analysis revealed 3 behavioral dimensions: express (prosocial behavior), comply (compliance with norms and rules) and disrupt (disruptive behavior). A composite prosocial measure can be calculated as the sum of express and comply.

The ASBI was developed to serve as the primary outcome measure for an intervention study (Hogan, Scott & Baur, 1992). Affectively positive and negative social skills were conceptualized as contextually appropriate and different from problem behaviors. The literature and existing instruments were surveyed to identify indicators; elimination of redundances from the pool of 383 descriptors of age-appropriate behaviors resulted in 83 items (Hogan, et al., 1992). Preliminary scale analysis was conducted on 545 prematurely born 3-year-olds as part of the Infant Health and Development Program (IHDP, 1990) at several national study sites. Factor analysis, using a three-factor solution and varimax rotation, identified 30 items with loadings of .35 or greater on the dimensions labeled express, comply and disrupt (Hogan, et al., 1992).

The alpha coefficients and inter-item correlations are described in Table 12. The IHDP study found comparably adequate reliabilities for the express and comply subscales; the lower internal consistency of the disrupt subscale is thought to be related to the smaller number of items (Hogan, et al., 1992). Low to moderate subscale intercorrelations, when examined for all subjects, were found between express and comply (.46), express and disrupt (-.21) and comply and disrupt (-.44) (Hogan, et al., 1992). In the IHDP sample, gender differences were significant only for the comply subscale, with girls rated higher (Hogan, et al., 1992). In Houck's longitudinal mother-toddler study, the alpha coefficients were similar at each age with the exceptions of lower coefficients for the disrupt scale. Houck's longitudinal study also found gender differences were significant, as girls obtained higher total scores at 24 months (t (124) = -1.88, $p < .05$) and at 36 months (t (124) = -2.87, $p < .01$) (Houck, 1999).

Table 12
Internal Consistency Coefficients for the ASBI Subscales

ASBI subscales	NIDH sample			Houck's longitudinal mother-toddler sample					
				12 months		24 months		36 months	
	Number of items	M of inter-corr.	Alpha coeff.	M of inter-corr.	Alpha coeff.	M of inter-corr.	Alpha coeff.	M of inter-corr.	Alpha coeff.
Express	13	.23	.79	.13	.69	.15	.67	.13	.61
Comply	10	.27	.79	.19	.70	. 21	.72	.23	.75
Disrupt	7	.26	.71	.09	.48	.13	.51	.14	.54
Prosocial composite	23	.19	.84	.14	.79	.14	.79	.14	.78

Construct validity was examined with the Child Behavior Checklist (Achenbach, 1987) and the Infant/Child Monitoring Questionnaire (Bricker, et. al., 1991). Subscale correlations of the ASBI with externalizing and internalizing dimensions of the Child Behavior Checklist for children 2-3 years of age ranged from .28 to .63, all significant at the .001 level (Hogan, et al., 1992). Correlations between the externalizing and internalizing scores and the express subscale were rs = -.28 and -.47, respectively; with the comply subscale, rs = -.61 and -.43, respectively; and with the disrupt subscale, rs = .49 and .63, respectively (Hogan, et al., 1992). The ASBI subscales each showed different relationship patterns with externalizing and internalizing behaviors (Table 13) (Hogan, et al., 1992).

Table 13
Correlations between Subscales of the ASBI and CBCL

	CBCL subscales	
	Externalizing	Internalizing
ASBI Subscales		
Express	-.28	-.47
Comply	-.61	-.43
Disrupt	.49	.63

Construct validity was also established using the Infant/Child Monitoring Questionnaire. The ASBI correlated with the relevant developmental dimensions of communication competence (r = .40, 12 months; r = .45, 24 months) and personal-social competence (r = .35, 12 months; r = .36, 24 months) (Houck, 1999). Social competence was correlated with total developmental competence at every age (r = .37, .41, and .44, at

12, 24, ad 36 months, respectively) (Houck, 1999). Social competence as measured by the ASBI was correlated with self-concept scores at 12 months ($\underline{r}$ = .37), 24 months ($\underline{r}$ = .43) and 36 months ($\underline{r}$ = .28) (Houck, 1999).

Internal consistency coefficients ranged from .75-.76 at 12, 24 and 36 months; longer-term stability was .42 (12-24 mo.), .54 (24-36 mo.) and .27 (12-36 mo.) (Houck, 1999). The validity studies show that the ASBI taps dimensions associated with social competence: communication skills to initiate and sustain nondisruptive interactions, personal-social competence reflects contingent responsiveness in social situations, and a strong self-concept is associated with the ability to impact one's social environment. In this study, the total score and the express, comply and disrupt subscale scores were used as indications of child social competence, the outcome variable of interest in this study.

Plan for Analysis

The analysis was organized in relation to the specific aims. The first aim was to examine the reliability and stability of the Snack Scale across 12, 24 and 36 months. Interrater reliability of the Snack Scale was examined between two coders using percent agreement and Cohen's kappa. The importance of the constituent mother and child behaviors for determining classifications was examined using discriminant function analysis. Chi square analysis was used to assess congruence between classifications, and with ratings of dyadic fit and affect. Chi square analysis and the lambda coefficient of association were used to assess for stability of classifications across 12, 24 and 36 months.

The second aim addressed the validity study of the Snack Scale. First, evidence for convergent validity was assessed by examining the associations between the Snack Scale and other observational scales measuring similar concepts. Convergent validity was examined with two measures from the larger study: the CABS (play setting) and NCATS (teaching setting). Chi square analysis was conducted with the CABS and Snack Scale classifications. Analysis of variance (ANOVA) was carried out using Snack Scale classification as the grouping variable and the NCATS scores as the dependent variable.

To obtain evidence for the construct validity of the Snack Scale, how mother-child interactive behaviors contributed to variations in child social competence during toddlerhood was examined. One-way ANOVA was used to compare the four mother classifications and the four child classifications (grouping variables) on social competence. ANOVAs were conducted at each age (12, 24, and 36 months) as well as using earlier mother and child classifications with later social competence scores (e.g., 12-month maternal classifications with social competence scores at 24 and 36 months).

The third aim of the study was to explore how child temperament was associated with mother-child interactive behavior during an eating episode and how temperament and mother-child interactions jointly were associated with social competence. The distribution of child temperament type and interactive style was explored, followed by an examination of the correlations between temperament difficulty and social competence. Chi square analysis was used to examine the associations between the temperament difficulty categories and the Snack Scale classifications. Analyses were carried out at each age as well as by using earlier predictors with later social competence.

The final aim was to explore how temperament and mother-child interactions jointly were associated with social competence. Temperament difficulty and maternal and child interactive styles were examined as jointly contributing to child social competence using ANCOVA. Social competence scores were entered as the dependent variables, with SS classifications as the grouping variable and child temperament difficulty as the covariate. These analyses were carried out at each age, as well as using earlier behavior patterns with later social competence (e.g., 12 month predictors with 24 and 36 month social competence scores).

CHAPTER IV

RESULTS

The results of this study are presented in this chapter, organized according to the aims of the study. Since the study used a new coding scale developed specifically to examine mother-toddler interactions in an eating context, both reliability and validity had to be established. The first section of the results chapter reports the reliability and stability of the Snack Scale for assessing the nature of mother-child interactive behavior during an eating episode at three time periods throughout the child's toddler years. The reliability and stability results will be used to direct further refinement of the measure. The second section reports the convergent validity of the Snack Scale using established using observational scales which measure similar concepts. The examination of construct validity examines how mother-child interactive behavior during an eating episode contributed to explaining variations in social competence during toddlerhood. The final section reports how child temperament, an inherent characteristic, was associated with mother-child interactive behavior during an eating episode and how temperament and mother-child interactions were jointly associated with social competence.

Reliability and Stability

The first aim of this study was the examination of the reliability and stability of the Snack Scale to assess mother-child interactions during snack across the child's age of 12-, 24- and 36 months. Reliability was examined within each data collection period for the ratings of mother classifications, child classifications, dyadic mutuality and affect.

Interrater reliability was examined first. The coding scheme's internal validity was then examined to determine if the behavioral frequencies differentiated the classification ratings. Finally, the consistency and congruence of the Snack Scale components were examined via the relationships between the three components of the scale as well as the stability of the measures throughout toddlerhood.

Observational Reliability

Dependability or reliability of the Snack Scale was examined between two coders using percent agreement and Cohen's kappa. Interrater reliability estimates were obtained for the assignments of mother and child classifications, mutuality ratings, and affect ratings for each of the coding periods. Cases were randomly selected from those data coded at each observation period (child's age) in the larger study. Reliability was examined in a nonsequential order. Data collected at the child's age of 24 months were examined first, followed by data collected at the child's age of 12 and 36 months. The results reflected strong reliability with the classifications at each observation period, evidenced by the kappa coefficients which account for chance agreement. The reliability coefficients for mutuality and affect ratings were adequate, although less consistent across the three observation periods. The percent agreement and reliability coefficients are presented in Table 14.

Interrater reliability was greater for child classification than for maternal classification and affect. Mutuality and affect ratings obtained adequate reliability between raters. Overall, the 24-month codings ere least dependable between raters which may reflect the lack of coder experience since the coding system was first developed and

used for this age group. The affect codings, especially 24- and 36-months, were also least dependable.

Table 14
Reliability Coefficients for the Snack Scale at 12, 24, and 36 Months

	12 months (n=30) agreement/kappa	24 months (n=20) agreement/kappa	36 months (n=22) agreement/kappa
mother classification	83%, k=.75	85%, k=.79	86%, k=.80
child classification	93%, k=.90	90%, k=.86	91%, k=.82
mutuality	93%, k=.87	75%, k=.60	91%, k=.79
mother affect	80%, k=.68	75%, k=.57	77%, k=.61
child affect	83%, k=.74	85%, k=.77	77%, k=.58

Internal Validity of the Coding Scheme

Next, the scale was examined to determine if the behavior frequencies differentiated the classification ratings. In other words, were the behavior frequencies in relation to the interactive partner's behavior (which were used to assign classifications) consistent with the definitions? Discriminant analysis was used to assess the relationship between the behavior frequencies and each partner's (mother and child) individual classification ratings. Observational data from 126 dyads at the child's age of 12, 24 and 36 months of age were analyzed using SPSS 9.0. The four mother and three child behaviors were entered as the predictor (i.e., independent) variables with either mother or child classification as the grouping (i.e., dependant) variable. The maternal behavioral predictors were facilitative direct, controlling direct, verbal follow and behavioral follow; the child behavioral predictors were self-directed autonomy, other-directed autonomy and

follow. The classifications were used as grouping variables. Maternal classifications included facilitative engaged, controlling engaged, superficial and controlling disengaged; child classifications included engaged assertive, intermittent engaged, compliant disengaged and active disengaged. Tables 15 - 17 present descriptive data for the behavioral predictor variables in relation to the maternal classifications at each observation period and Tables 18 - 20 present descriptive data for the behavioral predictor variables in relation to the child classifications at each observation period. Although the ranges of the behavior frequencies are somewhat similar across both mother and child classifications, the classifications differed according to the pattern of mean behavioral frequencies and variability of the behavioral frequencies.

Table 15
Descriptive Data for the Predictor Variables in Relation to Maternal Classification at 12 Months

Behavioral variables	facilitative engaged	controlling engaged	superficial	controlling disengaged
Child behaviors				
Self-directed autonomy				
Range	3-13	5 - 15	4 - 13	4 - 16
M	7.81	9.52	8.07	8.93
S.D.	3.31	2.46	2.51	3.16
Other-directed autonomy				
Range	3 - 11	0 - 10	0 - 10	0 - 10
M	5.33	3.78	3.77	2.53
S.D.	2.18	2.62	2.51	2.49
Follow				
Range	1 - 9	3 - 10	1 - 9	2 - 10
M	5.14	6.19	4.35	5.50
S.D.	1.90	2.13	1.81	1.87
Mother Behaviors				
Facilitative directs				
Range	3 - 10	1 - 10	1 - 12	1 - 9
M	5.81	6.48	5.23	4.87
S.D.	1.81	2.49	2.10	2.00
Controlling directs				
Range	0 - 4	0 -10	0 - 5	2 - 11
M	.90	3.81	1.60	5.70
S.D.	1.09	2.47	1.28	2.34
Verbal Follows				
Range	3 - 12	2 - 14	1 - 11	1 - 8
M	7.95	6.93	5.26	3.67
S.D.	2.31	2.76	2.58	1.67
Behavioral follows				
Range	0 - 3	0 - 3	0 - 4	0 - 3
M	.71	.85	1.07	.80
S.D.	.90	1.10	1.30	1.13

Table 16
Descriptive Data for the Predictor Variables in Relation to Maternal Classification at 24 Months

Behavioral variables	facilitative engaged	controlling engaged	superficial	controlling disengaged
Child behaviors				
Self-directed autonomy				
Range	4 - 10	4 - 14	3 - 12	5 - 17
M	6.70	8.58	7.56	10.48
S.D.	1.95	2.31	2.02	3.24
Other-directed autonomy				
Range	2 - 15	1 - 10	1 - 13	0 - 0
M	6.67	5.26	5.21	4.44
S.D.	3.36	2.54	2.73	2.47
Follow				
Range	4 - 11	2 - 13	0 - 9	1 - 13
M	6.79	5.68	4.21	5.00
S.D.	2.04	2.22	1.96	3.03
Mother Behaviors				
Facilitative directs				
Range	2- 13	2 - 13	2 - 12	2 - 14
M	6.79	6.58	5.18	6.36
S.D.	2.55	2.83	2.29	2.68
Controlling directs				
Range	0 - 4	0 - 8	0 - 4	1 - 12
M	0.79	3.05	1.74	5.16
S.D.	1.14	1.86	1.25	2.87
Verbal Follows				
Range	2 - 14	3 - 10	1 - 12	0 - 9
M	7.83	6.18	5.56	4.40
S.D.	3.05	1.96	2.56	2.22
Behavioral follows				
Range	0 - 3	0 - 3	0 - 4	0 - 3
M	.71	.85	1.07	.80
S.D.	.90	1.10	1.30	1.13

Table 17
Descriptive Data for the Predictor Variables in Relation to Maternal Classification at 36 Months

Behavioral variables	facilitative engaged	controllin g engaged	superficial	controlling disengaged
Child behaviors				
Self-directed autonomy				
Range	1 - 17	3 - 16	1 - 12	5 - 18
M	7.40	8.56	8.34	10.39
S.D.	3.20	3.02	2.78	2.91
Other-directed autonomy				
Range	3 - 11	0 - 16	2 - 14	0 - 13
M	7.28	6.28	8.16	6.29
S.D.	1.99	3.14	2.84	3.66
Follow				
Range	6 - 11	2 - 15	2 - 12	0 - 12
M	8.40	8.59	7.03	5.97
S.D.	1.66	1.66	2.59	2.48
Mother Behaviors				
Facilitative directs				
Range	3 - 13	2 - 15	1 - 9	1 - 11
M	7.04	8.41	5.47	5.68
S.D.	2.26	2.76	1.98	2.80
Controlling directs				
Range	0 - 3	0 - 8	0 - 4	0 - 8
M	0.36	2.53	1.08	3.71
S.D.	0.81	1.95	1.10	2.49
Verbal Follows				
Range	6 - 13	5 - 15	4 - 13	2 - 12
M	9.68	8.81	8.53	6.10
S.D.	1.91	2.42	2.44	2.65
Behavioral follows				
Range	0 - 2	0 - 3	0 - 4	0 - 2
M	0.20	0.56	1.34	0.68
S.D.	0.50	0.76	1.25	0.83

Table 18
Descriptive Data for the Predictor Variables in Relation to Child Classification at 12 Months

Behavioral variables	engaged assertive	intermitt. engaged	compliant disengaged	active disengaged
Child behaviors				
Self-directed autonomy				
Range	3 - 13	4 - 15	4 - 16	9 - 13
M	7.33	8.67	8.97	11.00
S.D.	3.07	2.61	3.00	1.83
Other-directed autonomy				
Range	3 - 11	0 - 10	0 - 5	0 - 6
M	5.75	4.33	1.31	2.00
S.D.	2.21	2.26	1.31	2.83
Follow				
Range	1 - 9	1 - 10	1 - 10	2 - 7
M	5.46	5.15	5.22	3.75
S.D.	2.17	1.89	2.14	2.36
Mother Behaviors				
Facilitative directs				
Range	2 - 10	1 - 12	1 - 10	1 - 6
M	5.79	5.59	5.44	3.50
S.D.	1.89	2.21	2.30	2.08
Controlling directs				
Range	0 - 4	0 - 11	0 - 11	0 - 7
M	1.04	2.97	4.34	4.25
S.D.	1.12	2.29	3.06	3.10
Verbal Follows				
Range	3 - 12	1 - 14	1 - 8	2 - 6
M	7.88	5.89	4.03	3.25
S.D.	2.31	2.82	1.84	1.89
Behavioral follows				
Range	0 - 3	0 - 4	0 - 4	0 - 3
M	0.79	1.05	0.66	1.00
S.D.	0.88	1.22	1.15	1.41

Table 19
Descriptive Data for the Predictor Variables in Relation to Child Classification at 24 Months

Behavioral variables	engaged assertive	intermitt. engaged	compliant disengaged	active disengaged
Child behaviors				
Self-directed autonomy				
Range	4 - 10	3 - 12	5 - 17	5 - 17
M	6.70	7.75	9.62	9.95
S.D.	2.02	2.15	2.65	3.12
Other-directed autonomy				
Range	2 - 15	2 - 13	1 - 7	0 - 9
M	7.04	5.94	3.31	4.24
S.D.	3.23	2.40	1.57	2.61
Follow				
Range	4 - 11	2 - 13	2 - 9	0 - 8
M	6.59	5.81	4.50	3.38
S.D.	2.02	2.48	2.00	1.99
Mother Behaviors				
Facilitative directs				
Range	2 - 13	2 - 13	2 - 10	2 - 14
M	6.81	5.92	6.04	5.95
S.D.	2.59	2.78	2.25	2.85
Controlling directs				
Range	0 - 5	0 - 9	0 - 7	0 - 12
M	1.37	2.58	3.00	3.95
S.D.	1.64	1.96	1.90	3.56
Verbal Follows				
Range	2 - 14	1 - 12	2 - 8	0 - 9
M	8.04	6.04	4.81	4.48
S.D.	2.89	2.15	1.65	2.46
Behavioral follows				
Range	1.22	1.50	.96	1.19
M	1.15	1.38	.92	.87
S.D.	0 - 4	0 - 6	0 - 3	0 - 3

Table 20
Descriptive Data for the Predictor Variables in Relation to Child Classification at 36 Months

Behavioral variables	engaged assertive	intermitt. engaged	compliant disengaged	active disengaged
Child behaviors				
Self-directed autonomy				
Range	1 - 17	1 - 16	3 - 14	7 - 18
M	7.29	8.42	9.44	12.00
S.D.	3.30	3.04	2.37	2.99
Other-directed autonomy	3 - 11	3 - 16	0 - 12	0 - 13
Range	7.38	8.48	4.50	5.80
M	1.91	2.62	2.68	3.77
S.D.				
Follow				
Range	6 - 11	0 - 15	4 - 11	2 - 12
M	8.50	7.43	7.31	5.40
S.D.	1.69	2.91	2.09	2.67
Mother Behaviors				
Facilitative directs				
Range	3 - 13	1 - 15	1 - 14	5 - 11
M	7.13	6.08	6.84	7.40
S.D.	2.33	2.67	3.19	1.84
Controlling directs				
Range	0 - 3	0 - 8	0 - 8	0 - 7
M	0.42	1.77	2.84	3.90
S.D.	0.83	1.87	2.229	2.51
Verbal Follows				
Range	6 - 13	4 - 15	2 - 12	2 - 8
M	9.71	8.95	6.81	4.90
S.D.	1.94	2.28	2.69	1.79
Behavioral follows				
Range	0 - 2	0 - 4	0 - 4	0 - 2
M	.25	.93	.75	.90
S.D.	.53	1.07	1.05	.99

Data Screening

Before initiating any analysis, the data were screened for missing data, univariate and multivariate outliers, and homogeneity of variance-covariance matrices. Missing data were found only with the data collected at the child's age of 12 months as five cases had data missing for all predictor variables due to partially erased videotapes; the classifications, mutuality and affect ratings were coded to consensus using the brief tapes. Univariate outliers were identified as those with z-scores greater than $\pm$ 3 standard deviations. At 12 months, two variables contained outliers: *mother controlling directs* (n = 2) and *mother behavioral follow* (n = 1). At 24 months, 4 variables contained outliers: *mother facilitating directs* (n = 1), *mother controlling directs* (n = 2), *mother verbal follow* (n = 2), and *child self-directed autonomy* (n = 2). One of these cases was an outlier on both mother controlling directs and child self-directed autonomy. At 36 months, four variables contained outliers: *mother facilitating directs* (n = 1), *mother controlling directs* (n = 1), *child self-directed autonomy* (n = 1), and *child follow* (n = 1). The outlier case for mother facilitating directs and child follow were one and the same. Using Mahalanobis distance with $p < .001$ (Tabachnick & Fidell, 1996), no cases were identified as multivariate outliers in the data collected at the child's age of 12 or 36 months. In contrast, data collected at the child's age of 24 months revealed two multivariate outliers when examined using discriminant analysis with mother classification as the grouping variable; one of those cases was also a multivariate outlier with child classification as the grouping variable.

The data were screened for the homogeneity of variance-covariance matrices using Box's *M.* Tabachnick and Fidell (1996) considered robustness to be uncertain with unequal group sizes and a significant Box's *M* ($p < .001$). Maternal group sizes ranged from 21- 43 at 12 months, 24 - 38 at 24 months, and 25 - 38 at 36 months. In contrast, the groups sizes of child classifications ranged more widely, from 4 - 61 at 12 months, 21 - 51 at 24 months, and 10 - 60 at 36 months. In spite of the unequal group sizes, Box's *M* revealed homogeneity of variance-covariance matrices for both maternal and child classifications at 12 and 36 months. However, at 24 months, Box's *M* was significant ($p \leq .001$) for both maternal and child classifications, thereby pointing to the possibility that the 24 month analyses were less robust.

Discriminant analyses were rerun with the univariate outliers recoded to a value approximating +3 standard deviations ($n = 3$, $n = 7$, and $n = 4$ at 12, 24, and 36 months, respectively). The influence of recoded variables varied, as reflected in the tests for homogeneity of variance-covariance matrices (Table 15). At the child's age of 12 months, recoding outliers on the two maternal variables did not affect Wilk's lambda but strengthened the homogeneity of the variance-covariance matrices for the maternal classifications; as expected, neither Wilk's lambda nor the assumptions of normality and homogeneity were affected for child classification since child variables were not involved. At the child's age of 24 months, the outliers on the three maternal variables and one child variable were recoded. For maternal classification as the grouping variable, Wilk's lambda was moderately strengthened and the assumption of homogeneity was met; there was no affect on multivariate outliers. When the analysis was run with child

classification as the grouping variable, the recoded variables had no effect on Wilk's lambda but corrected violations of the assumption of multivariate normality and homogeneity. At the child's age of 36 months, outliers on two maternal and two child variables were recoded. With mother classification as the grouping variable, the results were not effected. When the analysis was carried out with child classification as the grouping variable, the sole effect of the recoded cases was to slightly strengthen the test of the homogeneity assumption. Since the recoded cases eliminated univariate outliers and sometimes corrected the multivariate outliers as well as the heterogeneity of the variance-covariance matrix, the decision was made to use the recoded cases in all of the subsequent analyses.

Table 21
Comparison of Discriminant Analyses Results Run with Actual Frequencies and Recoded Frequencies

Age of Observation	**classification variable**	**Wilk's' lambda**		**Mahalanobis distance (cases < .001)**		**Box's *M***	
		actual data	recoded data	actual data	recoded data	actual data	recoded data
12 months	mother	.29	.28	n = 0	n = 0	.012	.040
	child	.39	.38	n = 0	n = 0	.001	.001
24 months	mother	.43	.37	n = 2	n = 2	.000	.007
	child	.44	.43	n = 1	n = 0	.000	.005
36 months	mother	.29	.28	n = 0	n = 0	.000	.000
	child	.33	.33	n = 0	n = 0	.002	.007

The data were further examined to consider the influence of selected cases on statistical assumptions and results of the analysis. At 12 months, the analysis was carried out using child classification as the grouping (i.e., dependant) variable after the cases

rated as *active disengaged* (n = 4) were recoded to *compliant disengaged.* This recoding eliminated potential problems related to a classification group size being equal to or smaller than the number of independent variables entered in the analysis (Tabachnick & Fidell, 1996) and yet retained the quality of disengagement in the grouping. Using discriminant analysis with three child classifications of uneven but substantial sizes (24, 61, 36), Wilk's lambda (λ = .32) was slightly improved but the assumptions for multivariate outliers and homogeneity of the variance-covariance matrices remained violated.

Similar results were also found after modifying data at 24 months. The discriminant analysis was conducted using maternal classification as the grouping variable after the two cases with multivariate outliers were eliminated. The results revealed minimal change in Wilks' lambda (value decreased .01) although the assumptions for multivariate outliers and homogeneity of the variance-covariance matrices were now met. Since the data modifications which corrected violations in the assumptions underlying discriminant analysis did little to strengthen the results, the decision was made to tolerate violations in the assumptions which persisted beyond the recoding of univariate outliers.

Decisions arising out of the data screening. The assumptions underlying discriminant analysis were minimally violated throughout this longitudinal study. Recoding the data to eliminate univariate outliers sometimes had the ripple effect of eliminating multivariate outliers and heterogeneity of the variance-covariance matrix yet at other times appeared to exert no influence. Tabachnick and Fidel (1996) related the

effect of violating the assumptions of discriminant analysis to the primary aim of the analysis, cautioning that heterogeneity of variance-covariance matrices may over classify cases into groups with greater dispersion. However, the primary aim of this analysis was to assess the interactive behaviors underlying the different classification groups and to ascertain the development of patterned social behaviors, so that mulivariate outliers and matrix heterogeneity are less likely to influence the analysis. Klecka (1980) presented a pragmatic approach to assessing the effect of violating the assumptions that was emplyed in this study. If the assumptions are violated and the percentage of correct classifications is high, the violations did little harm to the analysis. Yet if the percentage of correct classifications is low, then one must question if the results were due to weak predictor variables or due to violating the assumptions.

Relationships between Behavioral Frequencies and Classifications

Discriminant analysis, using SPSS version 9.0, was used to examine the relationship between the predictor mother's and child's behavioral frequencies and classifications. This study conceptualized each individual's behavior to be interdependent with, or in relation to, their partner's behavior. Thus, maternal and child behavoikrs were thought to have a combined contribution to the subsequent classification of the interactive paterner's behavior. Therefore, all behavioral frequencies were included as predictors in each analysis. Four maternal predicts were *facilitative direct*, *controlling direct*, *verbal follow* and *behavioral follow; the* three child predictors were *self-directed autonomy*, *other-directed autonomy* and *follow*. Mother and child classification served as the

grouping (i.e., dependant) variable in separate stepwise analyses to identify the salient predictor behaviors for each observation period.

The substantive utility of the derived discriminant functions was examined using canonical correlations, Wilk's lambda, and chi-square tests (Klecka, 1980). The meaning of each function was interpreted using the structure coefficients and the group centroids. The canonical correlation measures the association between the classification groups and the discriminant function; when squared, the canonical correlation represents the variance in the function explained by the groups (Klecka, 1980). Wilk's lambda, a measure of residual discrimination, was used to test the significance of the function by converting lambda into a chi-quare distribution (Klecka, 1980). The structure coefficients, as bivariate correlations between predictor variables and the function, were used to assess the unique contribution a predictor variable makes to a function (Klecka, 1980). The centroids, representing the mean of the discriminant scores for each classification group, were used to interpret differences between the classifications (Klecka, 1980). Additionally, the usefulness of the salient variables for predicting group classifications were reported as the percentage of cases correctly classified.

Classifications of maternal behaviors. Table 22 presents the results of the discriminant analysis at each observation period with mother classification as the grouping (i.e., dependant) variable. The predictor, or independant, variables which were important at each observation period were identified using step-wise discriminant analysis, with inclusion criteria that specified F probabilities at $p < .05$. The structure coefficients of the important predictor variables are highlighted in Table 22.

At the child's age of 12 months, two significant discriminant functions were calculated in the step-wise analysis. Both functions showed a strong relationship between groups and predictors, with a combined $\chi^2(12) = 135.68$, $p \leq .01$ and, after removal of the first function, $\chi^2(6)= 33.82$, $p \leq .01$. The first function accounted for 58% of the variance between groups; the second function accounted for 24% of the variance. Four predictor variables distinguished the mother classifications. The first function was characterized by high frequencies of *mother controlling directs* and low frequencies of *child other-directed autonomy*, with *mother controlling directs* the stronger discriminator along the function. The second function was characterized by high frequencies of both *mother facilitative directs* and *mother verbal follow*, with *mother verbal follow* the stronger discriminator. The first function maximally separated facilitative engaged from controlling disengaged mothers; the second function distinguished controlling engaged from superficial mothers (Table 23 and Figure 1). The first function correctly identified 61% of the maternal classifications.

Two significant discriminant functions were calculated in the step-wise analysis at 24 months as well. Both functions showed a strong relationship between groups and predictors, with a combined $\chi^2(12) = 114.23$, $p \leq .01$ and, after removal of the first function, a $\chi^2(6)=19.06$ $p \leq .01$. The first function accounted for 53% of the between-group variability; the second function accounted for 14% of the variance. Four predictor variables distinguished the maternal classifications. The first function was characterized by high frequencies of both *mother controlling directs* and *child self-directed autonomy,* with *mother controlling directs* the stronger discriminator along the function. The second

function was characterized by high frequencies of both *mother verbal follow* and *child follow*, with *child follow* the stronger discriminator. The first function maximally separated facilitative engaged from controlling disengaged mothers; the second function distinguished controlling engaged from superficial mothers (Table 23 and Figure 1). The first function correctly identified 60% of the mother classifications.

Three significant discriminant functions were calculated in the 36-month step-wise analysis. The functions showed a strong relationship between groups and predictors, with a combined $\chi^2(12) = 148.33$, $p \leq .01$. Removal of the first function revealed a $\chi^2(6)= 56.6$, $p \leq .01$, and, after removal of the second function, $\chi^2(4) = 16.46$, $p \leq .05$. The first function accounted for 53% of the between-group variability, with 28% accounted for by the second function and 13% accounted for by the third function. Six predictor variables distinguished the mother classifications. The first function was characterized by high frequencies of *mother controlling directs* and *child self-directed autonomy,* and by low frequencies of *mother verbal follow*; *mother controlling directs* the strongest discriminator along the function. The second function was characterized by high frequencies of *mother facilitative directs* and *child follow*, with *mother facilitative directs* the stronger discriminator. The third function was characterized by a high frequency of *mother behavior follow*. The first function maximally separated facilitative engaged from controlling disengaged mothers, the second function distinguished controlling engaged from superficial mothers, and the third function distinguished facilitative engaged from controlling engaged mothers (Table 23 and Figure 1). The first function correctly identified 68% of the mother classifications.

Table 22
Results of Step-wise Discriminant Analysis with Mother Classification as the Grouping Variable

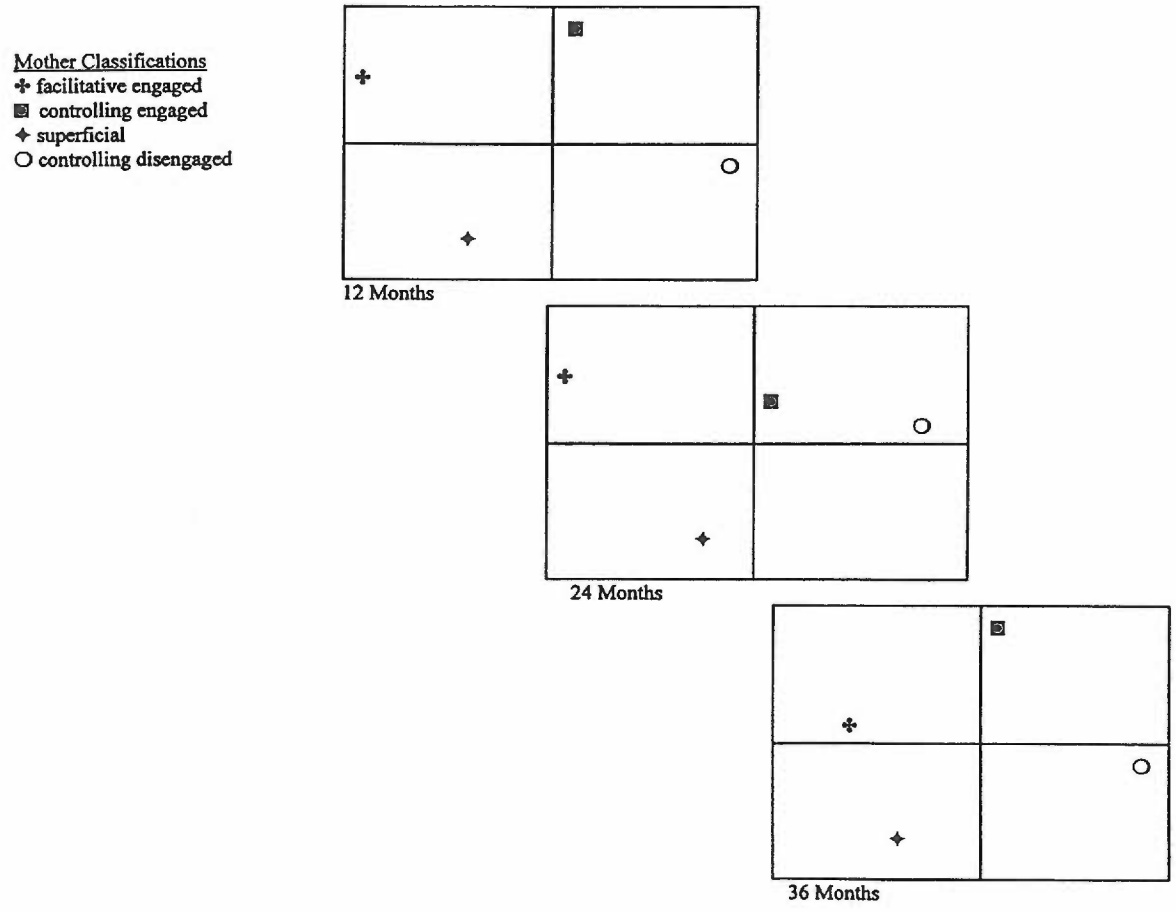
	12 months		24 months		36 months		
	functio n 1	functio n 2	function 1	functio n 2	functio n 1	functio n 2	functio n 3
Canonical correlation	.76	.49	.74	.38	.73	.53	.36
Wilk's lambda	**.31****	**.75****	**.39****	**.85***	**.29****	**.62****	**.87***
Chi-square	135.68 df = 12	33.82 df = 6	114.23 df = 12	19.06 df= 6	148.33 df = 12	56.60 df = 6	16.46 df = 4
structure coefficients of contributing variables							
mother behaviors facilitative directs	- .09	**.44**	- .06	**.43**	- .09	**.77**	.15
controlling directs	**.73**	.32	**.73**	.39	**.67**	.23	.22
verbal follow	.41	**.75**	- .40	**.53**	**- .48**	.27	.09
behavior follow					- .01	- .54	**.83**
child behaviors self-directed autonomy			**.48**	.18	**.33**	- .09	.03
other-directed autonomy	**- .29**	.20	.38	.17			
follow			- .17	**.93**	- .28	**.52**	.09
correct classifications (as identified by F1)	61%		60%		68%		

**$p \leq .001$ *$p \leq .05$

Table 23
Mother Classification Group Means on Discriminant Functions

	12 months		24 months		36 months		
group centroids	functio n 1	functio n 2	functio n 1	functio n 2	functio n 1	functio n 2	functio n 3
facilitative engaged	-1.57	.33	-1.57	.42	-1.25	.21	-.60
controlling engaged	.26	.86	.15	.24	.00	.91	.34
superficial	-.69	-.57	-.37	-.60	-.61	-.71	.31
controlling disengaged	1.77	-.20	1.76	.14	1.68	-.23	-.24

Figure 1
Discriminant Function Centroids for Mother Classifications at 12, 24 and 36 Months



Classifications of child behaviors. Table 24 presents the results of the discriminant analysis at each observation period with child classification as the grouping (i.e., dependant) variable. At the child's age of 12 months, one significant discriminant function was calculated in the step-wise analysis. The function showed a strong relationship between groups and predictors, with a $\chi^2(9) = 102.76$, $p \leq .01$. Three predictor variables distinguished the child classifications, which accounted for 56% of the between-group variability. The function was characterized by high frequencies of *child other-directed autonomy* and *mother verbal follow,* and low frequencies of *mother controlling directs; child other-directed autonomy* was the strongest discriminator along the function. The function maximally separated engaged assertive from compliant disengaged children (Table 25 and Figure 2). The first function correctly identified 71% of the child classifications.

At 24 months, one significant discriminant function was again calculated in the step-wise analysis. The function also showed a strong relationship between groups and predictors, with a$\chi^2(15) = 96.80.23$, $p \leq .01$. Five predictor variables distinguished the child classifications and accounted for 45% of the variance between-groups. The function was characterized by high frequencies of *child other-directed autonomy, child follow* and *mother verbal follow* along with low frequencies of *child self-directed autonomy* and *mother controlling* directs; *mother verbal follow* was the strongest discriminator along the function. The function maximally separated engaged assertive from active disengaged children (Table 25 and Figure 2). The first function correctly identified 59% of the child classifications.

Two significant discriminant functions were calculated in the step-wise analysis at 36 months. The functions showed a strong relationship between groups and predictors, with a combined $\chi^2(12) = 109.52$, $p \leq .01$. Removal of the first function revealed $\chi^2(6) = 24.10$, $p \leq .01$. The first function accounted for 42% of the between-group variability, with 17% accounted for by the second function. Four predictor variables distinguished the child classifications. The first function was characterized by high frequencies of *mother controlling directs* and *child self-directed autonomy* with low frequencies of *mother verbal follow,* which was the strongest discriminator along the function. The second function was characterized by a high frequency of *child other-directed autonomy*. The first function maximally separated engaged assertive children from active disengaged children; the second function maximally separated engaged assertive and compliant disengaged children from active disengaged children (Table 25 and Figure 2). The first function correctly identified 64% of the child classifications.

Table 24
Results of Step-wise Discriminant Analysis with Child Classification as the Grouping Variable

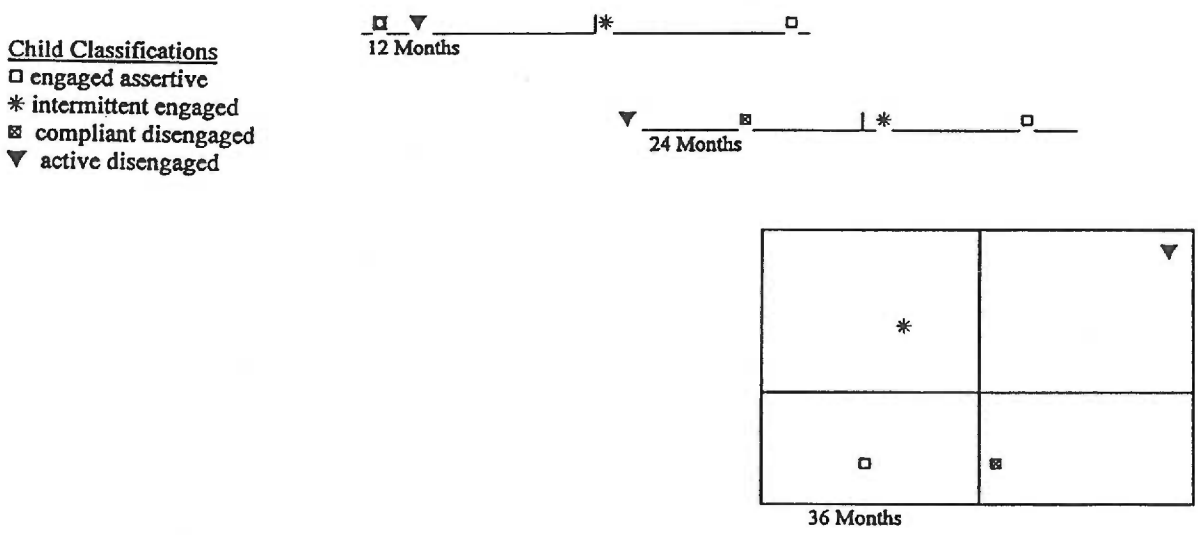
	child at 12 months	**child at 24 months**	**child at 36 months**	
	function 1	function 1	function 1	function 2
Canonical correlation	.76	.71	.71	.41
Wilk's lambda	**.41****	**.45****	**.40****	**.82***
Chi-square	102.76 df = 12	96.80 df = 12	109.52 df = 12	24.09 df = 6
structure coefficients of contributing variables (standardized coefficients)				
mother behaviors controlling directs	**- .41**	**- .35**	**.49**	.34
verbal follow	**.48**	**.54**	**- .62**	- .13
child behaviors self- directed autonomy		**- .50**	**.35**	.30
other-directed autonomy	**.68**	**.50**	- .53	**.80**
follow		**.49**		
correct classifications (as identified by F1)	71%	59%	64%	

**$p \leq .001$

Table 25
Child Classification Group Means on Discriminant Functions

	child's age of 12 months	child's age of 24 months	child's age of 36 month	
group centroids	function 1	function 1	function 1	function 2
engaged assertive	1.65	1.40	-1.07	-.50
intermediate engaged	.27	.34	-.52	.32
compliant disengaged	-1.58	-.95	1.17	-.47
active disengaged	-1.43	-1.89	1.95	.76

Figure 2
Discriminant Function Centroids for Child Classifications at 12, 24 and 36 Months.



Congruence and Consistency of the Ratings

The final issue regarding reliability involved the congruence and consistency of the scale. This included the stability of measures throughout toddlerhood as well as the relationships between the three components of the scale. Since the scale was designed to assess mother-child interactive patterns, reliability requires that measurements derived with the scale capture consistent characteristics of the mother and child interaction styles. For this reason, chi square analysis was also used to assess the congruence between the classifications, mutuality and affect ratings at each observation period. In addition, chi square analysis was used to assess the consistency of the classifications and the mutuality and affect ratings across the child's age of 12, 24 and 36 months.

Examination of the Snack Scale's Level of Measurement

Prior to examining the reliability of the Snack Scale, the classification data were assessed to ascertain whether they possibly reflected ordinal level of measurement. Behavioral frequencies were calculated for the behaviors reflecting the scale's salient dimensions (Table 26). Maternal responsiveness was calculated as the frequency of mother verbal follows in relation to child autonomy (mother verbal follows/child autonomy); maternal control was calculated as the frequency of controlling directs in relation to all mother behaviors (controlling directs/all mother behaviors). The frequencies calculated for the maternal responsiveness followed a consistent classification order at 12 and 24 months as did those calculated for the control dimension (facilitiative engaged, controlling engaged, superficial, controlling disengaged).

However, at 24 and 36 months, the rank order of frequencies calculated for the control dimension differed from those at 12 months as well as from the ordering of the responsiveness dimension at 12 and 24 months. At 24 months, the sequential order of maternal classification was: controlling disengaged, controlling disengaged, facilitative engaged, superficial. The sequence changed again at 36 months: controlling engaged, controlling disengaged, superficial, facilitative engaged. Thus, the behavioral frequencies of the maternal dimensions of responsiveness and control indicated the maternal classifications represented a nominal level of measurement.

Table 26
Maternal Behaviors: Proportions of Behavioral Frequencies Reflecting Responsiveness and Control

Maternal Responsiveness (verbal follow/child autonomy)	**12 months**		**24 months**		**36 months**	
	M	S.D.	M	S.D.	M	S.D.
facilitative engaged	6.52	2.36	7.95	3.94	8.96	2.71
controlling engaged	4.59	2.69	6.05	2.67	7.47	3.36
superficial	4.52	2.85	6.01	2.99	9.62	3.72
controlling disengaged	2.99	2.53	4.89	2.65	6.95	3.88
F value (df = 3)	**7.28*** **		**4.29***		**4.24***	
Maternal Control (controlling directs/all behavior)	**12 months**		**24 months**		**36 months**	
	M	S.D.	M	S.D.	M	S.D.
facilitative engaged	16.09	3.14	9.86	3.46	10.29	1.94
controlling engaged	15.12	3.41	11.09	3.12	12.29	3.66
superficial	13.06	3.18	9.19	3.66	11.21	2.37
controlling disengaged	10.33	2.28	11.72	4.33	11.69	4.92
F value (df = 3)	**7.28*** **		**3.23***		1.71	

*$p \leq .05$ **$p \leq .001$ ***$p \leq .000$

Child autonomy was calculated as the frequency of child other-directed autonomy in relation to all child behaviors (other-directs/all behavior) and the dimension of child responsiveness was calculated as the frequency of child follow in relation to all mother directs (child follows/all mother directs) (Table 27). The frequencies calculated for the child autonomy dimension showed a trend towards an ordinal level of measurement. The sequence was uniform at 12 and 24 months (engaged assertive, intermittent engaged, compliant disengaged, active disengaged). However, at 36 months, the two groups of engaged child classifications had equal frequency values (engaged assertive and intermittent engaged). Also of note is that at 24 months, the frequencies calculated for the autonomy dimension were comparable for disengaged children. For all classifications, there was a progressive increase in other-directed autonomy over time except for the active disengaged children who rendered a sizable decline from 24 to 36 months.

For the child responsiveness dimension at 12 and 36 months, the child classifications were sequenced as found for the autonomy dimension at 12 and 24 months. At 24 months, the sequence of frequencies for the autonomy dimension were inverted (active disengaged, compliant disengaged, intermittent engaged, engaged assertive). Two patterns emerged with respect to the dimension of child responsiveness. First, all children had a dramatic decline in responsiveness at 24 months but otherwise had an increase from 12 to 36 months. And contrary to expectations at 2 years, the active disengaged children were most responsive to their mothers. Clearly, the Snack Scale reflected a nominal level of measurement, and subsequent analyses preceded accordingly.

Table 27
Proportions of Behavioral Frequencies Reflecting the Autonomous and Responsiveness Dimensions of Child Engagement

Child Autonomy (other-directs/all behavior)	**12 months**		**24 months**		**36 months**	
	M	S.D.	M	S.D.	M	S.D.
engaged assertive	12.20	3.57	14.82	5.13	17.32	2.94
intermittent engaged	10.06	3.45	12.58	5.59	17.32	3.81
compliant disengaged	6.71	2.42	8.18	2.73	12.33	3.46
active disengaged	5.94	3.50	8.09	4.51	5.61	4.44
F value (df = 3)	**15.73*** **		**18.63*** **		**17.48*** **	
Child Responsiveness (child follows/all mother directs)	**12 months**		**24 months**		**36 months**	
	M	S.D.	M	S.D.	M	S.D.
engaged assertive	10.11	4.34	2.44	1.54	15.06	4.02
intermittent engaged	8.07	3.47	3.73	2.23	10.13	4.98
compliant disengaged	7.49	4.00	3.82	2.06	9.75	4.36
active disengaged	4.11	2.59	5.26	5.82	9.11	2.85
F value (df = 3)	**2.75***		**3.48***		2.54	

*$p \leq .05$ **$p \leq .001$ ***$p \leq .000$

Stability of the Classifications

Maternal classifications. Chi square analysis was used to examine the stability of the maternal classifications over 1-year intervals, from the child's ages of 12 to 24 months and 24 to 36 months, and over a 2-year interval, from the child's age of 12 to 36 months (Tables 28 - 30). Stable significant associations ($p \leq .000$) were found between the maternal classification assigned in earlier observation periods with the later classification: (χ^2 (df = 9) = 73.76, 12 - 24 months; χ^2 (df = 9) = 71.26, 24-36 months; and χ^2 (df = 9) = 73.76, 12-36 months. The stability of the classification assignments was reflected in the similar reductions in prediction error derived using the earlier

classification period as the independent variable with later classification as the dependent variable ($\underline{\lambda}$ = .35, 12-24 months; $\underline{\lambda}$ = .32, 24-36 months; $\underline{\lambda}$ = .35, 12-36 months; all $\underline{p} \leq .000$). The earlier maternal classification reduced approximately one third of the error in predicting later classification ratings regardless of the time interval. Thus, the maternal classifications assigned at the child's age of 12 months were moderately stable over time.

Table 28
Maternal Classifications, 12 to 24 Months

	24 Months			
12 Months	**facilitative engaged**	**controlling engaged**	**superficial**	**controlling disengaged**
facilitative engaged	13	7	4	
controlling engaged	6	13	6	3
superficial	4	6	27	6
controlling disengaged	1	12	2	16

χ^2 (df = 9) = 73.76, $p \leq .000$ 24 mo mother dependent: $\lambda = .35$, $p \leq .000$

Table 29
Maternal Classifications, 24 to 36 Months

	36 Months			
24 Months	**facilitative engaged**	**controlling engaged**	**superficial**	**controlling disengaged**
facilitative engaged	17	5	2	
controlling engaged	5	16	10	7
superficial	3	7	19	10
controlling diseng.		4	7	14

χ^2 (df = 9) = 71.26, $p \leq .000$ 36 mo mother dependent $\lambda = .32$, $p \leq .000$

Table 30
Maternal Classifications, 12 to 36 Months

	36 Months			
12 Months	**facilitative engaged**	**controlling engaged**	**superficial**	**controlling disengaged**
facilitative engaged	13	7	4	
controlling engaged	6	13	6	3
superficial	4	6	27	6
controlling disengaged	1	12	2	16

χ^2 (df = 9) = 73.76, $p \leq .000$ 36 mo mother dependent: $\lambda = .35$, $p \leq .000$

The mother classifications were then examined to determine predominant classification assignments across the three observation periods. Forty mothers (32%) were consistently assigned the same classification at every observation: 11 facilitative engaged, 8 controlling engaged, 13 superficial, and 8 controlling disengaged. The majority of mothers (n = 73, 58%) were assigned the same classification in two of the three observation periods. Specifically, 11 were classified as facilitative engaged, 19 as controlling engaged, 22 as superficial, and 21 as controlling disengaged. Thus, 90% (n = 113) were considered to have an established interaction style according to having been assigned the same classification in at least two (if not three) observations. Conversely, 13 mothers (10%) were assigned a different classification at each observation period. No clear pattern emerged regarding the movement of the inconsistent mothers' classifications over time. The movement was positive for some mothers, who moved towards more engaged (n = 2) or less controlling classifications (n = 5) at the child's age of 36 months; others shifted towards less engaged (n = 4) or more controlling classifications (n = 2).

The maternal classifications were examined for their stability in terms of the dichotomous categories of engagement and control. First, chi square analysis was used to assess the dimension of engagement over 12, 24 and 36 months. The classifications were recoded so that facilitative engaged and controlling engaged groups were collapsed into an engaged category; superficial and controlling disengaged groups were collapsed into a disengaged category. Stable significant associations were found between the dichotomous engagement categories assigned in earlier observation periods with the later

classifications: χ^2 (df = 1) = 23.57, 12 - 24 months; χ^2 (df = 1) = 28.66, 24-36 months; and χ^2 (df = 1) = 31.66, 12-36 months; all $p \leq .000$. The strength of stability was reflected in the increasing values of the associated phi coefficients (φ = .43, 12-24 months; φ = .48, 24-36 months; φ = .50, 12-36 months; all $p \leq .000$).

The classifications were also recoded to reflect the dimension of control manifested by the mother's interaction style. The facilitative engaged and superficial groups were collapsed into a "not controlling" category; the controlling engaged and controlling disengaged groups were collapsed into a "controlling" category. Stable significant associations were found between the dichotomous control categories assigned in earlier observation periods with the later classification: (χ^2 (df = 1) = 26.81, $p \leq .000$, 12 - 24 months; χ^2 (df = 1) =11.46, $p \leq .001$, 24-36 months; and χ^2 (df = 1) = 7.17, $p \leq .007$, 12-36 months. A diminishing strength of the stability was reflected in the associated phi coefficients (φ = .46, 12-24 months; φ = .30, 24-36 months; φ = .24, 12-36 months).

Child classifications. Chi square analysis was also used to examine the stability of the child classifications over 1-year intervals, from the child's ages of 12-24 months and 24-36 months, and over a 2-year interval, from the child's age of 12-36 months (Table 31 - 33). Again, the strength of the association was measured as the proportional reduction in error (PRE), using the later classification as the dependent variable in the directional measure of the Lambda association of congruence. Stable significant associations ($p \leq .000$) were found between the child classification assigned in earlier observation periods with the later classification: χ^2 (df = 9) = 42.97, 12 - 24 months; χ^2 (df

= 9) = 53.16, 24-36 months; and χ^2 (df = 9) = 33.06, 12-36 months. The child classifications were less stable than the maternal classifications. The classification assigned at the child's age of 12 months reduced 12% of the prediction error at 24 months and 5% at 36 months, neither of which exceeded $p \leq .05$. Interestingly, the classification assigned at the child's age of 24 months reduced 20% of the prediction error at 36 months, with $p \leq .034$. Thus, the classifications assigned to younger toddlers were not stable although the classifications assigned to older toddlers demonstrated some stability over a 1-year interval.

Table 31
Child Classifications, 12 to 24 Months

	24 Months			
12 Months	**engaged assertive**	**intermittent engaged**	**compliant disengaged**	**active disengaged**
engaged assertive	16	9		2
intermittent engaged	9	31	14	8
compliant disengaged	2	12	10	9
active disengaged			2	2

χ^2 (df = 9) = 42.97, p ≤.000 24 mo. child dependent: χ^2= .12, λ .080

Table 32
Child Classifications, 24 to 36 Months

	36 Months			
24 Months	**engaged assertive**	**intermittent engaged**	**compliant disengaged**	**active disengaged**
engaged assertive	16	7	3	1
intermittent engaged	7	32	11	2
compliant disengaged	1	15	8	2
active disengaged		6	10	5

χ^2 (df = 9) = 53.16, p ≤ .000 24 mo. child dependent: χ^2 = .20, λ .034

Table 33
Child Classifications, 12 to 36 Months

	36 Months			
12 Months	**engaged assertive**	**intermittent engaged**	**compliant disengaged**	**active disengaged**
engaged assertive	11	12	32	2
intermittent engaged	12	33	13	4
compliant disengaged	1	14	16	2
active disengaged		1	1	2

χ^2 (df = 9) = 33.06, p ≤ .000 36 mo. child dependent: χ^2= .05, λ .60

The child classifications were then examined to determine predominant classification assignments across the three observation periods. Thirty-four children (27%) were consistently assigned the same classification: 9 engaged assertive, 21 intermittent engaged, 2 compliant disengaged, and 2 active disengaged. The majority of children (n = 82, 65%) were assigned a consistent pattern in two of the three observation periods. Sixteen were classified as engaged assertive, 35 as intermittent engaged, 26 as compliant disengaged, and 3 as active disengaged. Thus, 89% of the children had a predominant interaction style, having been assigned the same classification on at least two or three observations. Conversely, 14 children (11%) were assigned a different classification at each observation period.

Over half of the children manifested an overall engaged interaction style throughout toddlerhood: 89 (71%) at 12 months, 79 (63%) at 24 months, and 84 (69%) at 36 months. A small number of the children shifted into a disengaged interaction style during toddlerhood: 10 (8%) between 12 to 24 months and 5 (4%) between 24 to 36 months. More of the inconsistent children moved into less engaged classifications (n = 9) over time than towards more engaged classifications (n = 5). Identical subgroups were found when the inconsistently classified children were considered on the basis of a predominantly engaged or disengaged interaction style.

Finally, the child classifications were considered in terms of the dichotomous category of engaged or disengaged interaction style. Chi square analysis was used to examine the dimension of engagement overtime. The classifications were recoded so that engaged assertive and intermediate engaged groups were collapsed into the engaged

category; compliant disengaged and active disengaged groups were collapsed into the disengaged category. Stable significant associations ($p \leq .000$) were found between the dichotomous engagement categories assigned in earlier observation periods with the later classifications: χ^2 (df = 1) = 13.84, 12 - 24 months; χ^2 (df = 1) = 13.30, 24-36 months; and χ^2 (df = 1) = 12.93, 12-36 months. The stability of the classification assignments were also reflected in the similar values of the phi coefficients throughout toddlerhood (φ = .33, 12-24 months; φ = .33, 24-36 months; φ = .32, 12-36 months; all $p \leq .000$).

Congruence between mother and child classifications. Chi square analysis was used to examine the associations between concurrent maternal and child classifications at the child's ages of 12, 24 and 36 months (Tables 34 - 36). The strength of each relationship was examined as the proportional reduction in error (PRE) reflected in the symmetric and directional measures of the Lambda association of congruence. As shown in the following tables, maternal and child classifications were related ($p \leq .000$) at all observation periods. The greatest reduction in error occurred at the child's age of 36 months and the least at the child's age of 24 months. At the child's age of 12 months, mother and child classifications symmetrically reduced 42% of the error in predicting the classifications. The relationship weakened at the child's age of 24 months, as the error in prediction declined to 33%; the relationship improved at the child's age of 36 months, reducing 47% of the error in prediction. The importance of the mother's role in setting the dyadic relationship at 12 months is suggested in the directional measures, as mother classification reduced 10% more of error in the prediction of child classification than visa versa (47% to 37%). In contrast, mother classification reduced only slightly more of the

error in child classification at 24 months (35% versus 31%), and child classification reduced slightly more of the error in mother classification at 36 months (48% versus 46%).

Table 34
Associations Between Mother and Child Classifications at 12 Months

Mother Classification	Child Classification			
	engaged assertive	intermittent engaged	compliant disengaged	active disengaged
facilitative engaged	22	2		
controlling engaged	2	21	5	
superficial	3	30	9	1
controlling disengaged		9	19	3

χ^2 (df = 9) = 114.89, $p \leq .000$ symmetric $\lambda = .42$, $p \leq .000$
mother dependent $\lambda = .37$, $p \leq .000$ child dependent $\lambda = .47$, $p \leq .000$

Table 35
Associations Between Mother and Child Classifications at 24 Months

Mother Classification	Child Classification			
	engaged assertive	intermittent engaged	compliant disengaged	active disengaged
facilitative engaged	22	2		
controlling engaged	4	21	8	5
superficial	1	24	9	5
controlling disengaged		5	9	11

χ^2 (df = 9) = 107.69, $p \leq .000$ symmetric $\lambda = .33$, $p \leq .000$
mother dependent $\chi^2 = .31$, $p \leq .000$; child dependent $\lambda = .35$, $p \leq .000$

Table 36
Associations Between Mother and Child Classifications at 36 Months

Mother Classification	Child Classification			
	engaged assertive	intermittent engaged	compliant disengaged	active disengaged
facilitative engaged	23	2		
controlling engaged	1	20	11	
superficial		32	6	
controlling disengaged		6	15	10

χ^2 (df = 9) = 158.71, $p \leq .000$ symmetric $\lambda = .47$, $p \leq .000$
mother dependent $\lambda = .48$, $p \leq .000$; child dependent $\lambda = .46$, $p \leq .000$

Dyadic styles. The predominant mother and child classifications were used to assign a rating of the dyadic interaction style manifested throughout toddlerhood. Dyadic styles were first examined as the actual matches of maternal and child classifications, which identified seven styles that showed no associations over time. The groupings were then collapsed into four styles to reflect the dimensions of maternal engagement and control in relation to the child's engagement: 1) mother engaged facilitative--child engaged (both assertive and intermittent), 2) mother engaged controlling--child engaged/compliant disengaged, 3) mother superficial--child compliant disengaged/intermittent engaged, 4) mother controlling disengaged--child disengaged (compliant and active disengaged)/ intermittent engaged. For mothers, the dyadic style groupings retained the original descriptions of maternal interactive style. The child groups reflect a relative degree of "interactiveness," so that the child component of each dyadic grouping combined adjacent child behavioral styles. Thus, the dyadic styles are essentially mother-driven groupings, reflecting maternal classifications.

The distribution of the dyadic style assignments at each observation period followed a similar pattern (Table 37). The group consisting of engaged mothers with engaged children was the smallest at each observation period, and the group of superficial mothers with disengaged compliant or intermittently engaged children the largest. The remaining groups (controlling engaged mothers with engaged or compliant children, and controlling disengaged mothers with disengaged or intermittently engaged children) were of similar size except at 24 months, when more mothers were controlling engaged.

Table 37
Dyadic Style: Distribution of Assignments at 12, 24 and 36 months

	Dyadic Interactive Style			
	mother facil. engaged-child engaged	**mother control engaged-child engaged/complt.**	**mother superficial-child complt./intermit.**	**mother control disengaged-child disengaged/intermit.**
12 months	24 (19%)	28 (22%)	43 (34 %)	31 (25%)
24 months	24 (19%)	39 (31%)	39 (31%)	24 (19%)
36 months	25 (20%)	32 (25%)	37 (29%)	32 (25%)

Chi square analysis was used to examine the stability of the dyadic interactive styles over 1-year intervals, from the child's ages of 12-24 months and 24-36 months, and over a 2-year interval, from the child's age of 12-36 months. The strength of the association was measured as the proportional reduction in error (PRE), using the later interactive style as the dependent variable in the directional measure of the Lambda association of congruence. Stable significant associations ($p \leq .000$) were found between the dyadic style assigned in earlier observation periods with the later classification: χ^2 ($df = 9$) = 71.94, 12 - 24 months; χ^2 ($df = 9$) = 67.55, 24-36 months; and χ^2 ($df = 9$) = 46.33, 12-36 months. The dyadic interaction style assigned at the child's age of 12 months reduced 33% of the prediction error at 24 months ($p \leq .001$) and 24% at 36 months ($p \leq .006$); the style assigned at 24 months reduced 29% of the prediction error at 36 months ($p \leq .000$). Again, these findings mirror those found regarding the stability of the maternal classifications over time.

Associations between Dichotomous Mother and Child Classifications. The congruence between mother and child classifications was also examined using the dichotomously coded classifications. Maternal classifications were recoded in terms of

the dichotomous categories of engagement and control; therefore, child engagement was examined using both maternal dimensions. First, the congruence was assessed between dichotomously coded maternal engagement and child engagement at 12, 24 and 36 months. Then analysis was then carried out using the maternal control dimension to assess its congruence with child engagement.

The associations between concurrent maternal and child dichotomous engagment classifications were examined at the child's ages of 12, 24 and 36 months of age (Tables 38). The strength of the relationships were evaluated as the Phi coefficient. The dichotomously coded maternal and child classifications were significantly related ($p \leq .000$) at all observation periods. The relationship was strongest at 12 months ($\varphi = .36$, $p \leq .000$), and decreased according to the child's age ($\varphi = .33$, $p \leq .000$ at 24 months; $\varphi = .27$, $p \leq .002$ at 36 months). Engaged mothers tended to have children who were also engaged, although the association decreased over time. Thus, the salience of maternal engagement diminished in relation to children's growing skills and competencies for initiating and sustaining social interaction.

Table 38
Frequency Distributions between Dichotomously Coded Mother Engagement and Child Engagement at 12, 24 and 36 Months

	Child Engagement	Maternal Engagement	
		engaged	disengaged
12 months	**engaged**	47	5
	disengaged	42	34
χ^2 (df = 1) = 16.64, $p \leq .000$ phi = .36, $p \leq .000$			
24 months	**engaged**	49	13
	disengaged	30	34
χ^2 (df = 1) = 13.92, $p \leq .000$ phi = .33, $p \leq .000$			
36 months	**engaged**	46	11
	disengaged	38	31
χ^2 (df = 1) = 9.23, $p \leq .002$ phi = .27, $p \leq .002$			

Associations between concurrent dichotomous maternal control and child engagement classifications were evaluated at the child's ages of 12, 24 and 36 months of age (Tables 39). Again, the strength of the relationships was examined as the Phi coefficient and the dichotomously coded maternal and child classifications were significantly related (λ .000) at all observation periods. The relationship was similarly strong between 12 (φ = .34) and 24 months (φ = .31; both $p \leq .000$), and increased sharply at 36 months (φ = .51, $p \leq .000$).

Table 39
Frequency Distributions between Mother Control and Child Engagement at 12, 24 and 36 Months

	Child Engagement	Maternal Control	
		not controlling	controlling
12 months	**engaged**	57	10
	disengaged	32	27
χ^2 (df = 1) = 14.38, p ≤ .002 phi = .34, p ≤ .000			
24 months	**engaged**	49	14
	disengaged	30	33
χ^2 (df = 1) = 20.24, p ≤ .000 phi = .40, p ≤ .000			
36 months	**engaged**	57	6
	disengaged	27	36
χ^2 (df = 1) = 32.14, p ≤ .000 phi = .50, p ≤ .000			

Dyadic mutuality. Chi square analysis was subsequently used to examine the stability of the mutuality ratings over 1-year intervals, from the child's ages of 12-24 months and 24-36 months, and over a 2-year interval, from the child's age of 12-36 months (Table 40). The strength of the association was measured as the proportional reduction in error (PRE), using the later mutuality ratings as the dependent variable in the directional measure of the Lambda association of congruence. Stable significant associations (all at p ≤ .000) were found between the mutuality rating assigned in earlier observation periods with the later classification: (χ^2 (df = 4) = 47.80, 12 - 24 months; χ^2 (df = 4) = 50.46, 24-36 months; and χ^2 (df = 4) = 39.10, 12-36 months. The strength of the association was significant only for the 12-24 month interval. The mutuality rating assigned at the child's age of 12 months reduced 30% (p ≤ .005) of the prediction error at 24 months. Otherwise, the strength of the association diminished in relation to the child's age and over time. The rating assigned at the child's age of 24 months reduced 11%

($p \leq .452$) of the prediction error at 36 months, and the rating assigned at the child's age of 12 months reduced 11% ($p \leq .404$) of the prediction error at 36 months. Thus, moderate consistency of the mutuality rating was evidenced only in the early toddler period.

Table 40
Mutuality Ratings: Stability over 12, 24 and 36 Months

	24 Months		
12 Months	**poor**	**some**	**strong**
poor	22	7	2
some	14	47	12
connected	2	8	12

χ^2 (df = 4) = 47.80, $p \leq .000$ 24 mo. mutuality dependent: $\lambda = .30$, $p \leq .005$

24 Months	**36 Months**		
poor	19	19	
some	11	41	10
connected		10	16

χ^2 (df = 4) = 50.46, $p \leq .000$ 36 mo. mutuality dependent: $\lambda = .11$, $p \leq .452$

12 Months	**36 Months**		
poor	18	13	
some	11	47	15
connected	1	10	11

χ^2 (df = 4) = 39.10, $p \leq .000$ 36 mo. mutuality dependent: $\lambda = .11$, $p \leq .404$

The congruence between the concurrent mutuality ratings and maternal classifications was examined using chi square analyses (Tables 41 - 43). The strength of the relationships were examined as the proportional reduction in error (PRE) as reflected in the symmetric and directional measures of the Lambda association of congruence. As shown in the following table, mutuality ratings and maternal classifications were

significantly related ($p \leq .000$) at all observation periods. The associations increased over time and in relation to the child's age, as did the symmetric and directional Lambda measures of congruence. When the mutuality rating was used to predict mother classification, the prediction error was reduced by 41% at 12 months, 44% at 24 months, and 52% at 36 months (all of which were significant at $p \leq .000$). More interestingly, when mother classification was used to predict dyadic mutuality, the error in prediction was reduced by 59% at 12 months, 67% at 24 months, and 79% at 36 months (all significant at $p \leq .000$). As expected, facilitative engaged mothers predicted the that mutuality was rated as connected, controlling disengaged mothers predicted the fit would be poor, and those classified as controlling engaged or superficial predicted some degree of mutuality.

Table 41
Mutuality Ratings and Maternal Classifications at 12 Months

Mother Classification	Dyadic Mutuality		
	poor	some	connected
facilitative engaged		2	22
controlling engaged	1	27	
superficial	9	34	
controlling disengaged	21	10	

χ^2 (df = 6) = 152.32, p ≤ .000 symmetric λ = .48, p ≤ .000
mother classification dependent λ = .41, p ≤ .000; mutuality dependent λ = .59, p ≤ .000

Table 42
Mutuality Ratings and Maternal Classifications at 24 Months

Mother Classification	Dyadic Mutuality		
	poor	some	connected
facilitative engaged		2	22
controlling engaged	6	28	4
superficial	8	31	
controlling disengaged	24	1	

χ^2 (df = 6) = 151.18, p ≤ .000 symmetric λ = .54, p ≤ .000
mother classification dependent λ = .44, p ≤ .000; mutuality dependent λ = .67, p ≤ .000

Table 43
Mutuality Ratings and Maternal Classifications at 36 Months

Mother Classification	Dyadic Mutuality		
	poor	some	connected
facilitative engaged			25
controlling engaged	1	31	
superficial	4	33	1
controlling disengaged	25	6	

χ^2 (df = 6) = 189.59, p ≤ .000 symmetric λ = .62, p ≤ .000
mother classification dependent λ = .52, p ≤ .000; mutuality dependent λ = .79, p ≤ .000

The concurrent mutuality ratings and child classifications were also examined using chi square analyses (Tables 44 - 46). The strength of the relationships was assessed as the proportional reduction in error (PRE) as reflected in the symmetric and directional measures of the Lambda association of congruence. As shown in the following table, the mutuality ratings and child classifications were significantly related ($p \leq .000$) throughout toddlerhood. The strength of the association was stable when assessed as a symmetrical lambda measure of congruence and when child classification was used to predict the mutuality rating; both measurement approaches found the prediction error to be reduced by approximately 60% (56-61%). Variations in the strength of the associations were found when the mutuality rating was used to predict child classification. The prediction error was reduced by 60% at 12 months, 50% at 24 months, and 70% at 36 months (all of which were significant at $p \leq .000$). At 36 months, the mutuality rating reduced a greater amount of the error in predicting child classification than visa versa. Essentially, a rating of connected mutuality predicted children would be classified as engaged assertive whereas poor mutuality predicted active disengagement classification and, about half of the time, compliant disengaged; most of the ratings of some amount of mutuality were obtained by intermittently engaged children.

Table 44
Mutuality Ratings and Child Classifications at 12 Months

Child Classification	Dyadic Mutuality		
	poor	some	connected
engaged assertive		7	20
intermittent engaged	3	57	2
compliant disengaged	24	9	
active disengaged	4		

χ^2 (df = 9) = 144.83, p ≤ .000 symmetric λ = .61, p ≤ .000
child classification dependent λ = .61, p ≤ .000; mutuality dependent λ = .60, p ≤ .000

Table 45
Mutuality Ratings and Child Classifications at 24 Months

Child Classification	Dyadic Mutuality		
	poor	some	connected
engaged assertive		3	24
intermittent engaged	1 3	45	2
compliant disengaged	21	21	
active disengaged	20	1	

χ^2 (df = 9) = 157.19, p ≤ .000 symmetric λ = .56, p ≤ .000
child classification dependent λ = .50, p ≤ .000; mutuality dependent λ = .63, p ≤ .000

Table 46
Mutuality Ratings and Child Classifications at 36 Months

Child Classification	Dyadic Mutuality		
	poor	some	connected
engaged assertive		1	23
intermittent engaged	3	54	3
compliant disengaged	18	14	
active disengaged	9	1	

χ^2 (df = 9) = 157.48, p ≤ .000 symmetric λ = .57, p ≤ .000
child classification dependent λ = .70, p ≤ .000; mutuality dependent λ = .61, p ≤ .000

Association between maternal and child affect ratings. The congruence between concurrent maternal and child affect was assessed using chi square analysis (Tables 47 - 49); relationship strength was examined as the proportional reduction in error (PRE), reflected by the symmetric and directional measures of the Lambda association of congruence. As shown in the following table, maternal and child affect were significantly related ($p \leq .000$) at all observation periods. Broadly, positive, neutral and negative maternal affect was linked with the same child affect. For positive and negative maternal affect mismatches, child affect typically was neutral. Although neutral maternal affect predicted the same child affect, the mismatches were almost evenly distributed between positive and negative. The greatest reduction in error occurred at 24 months and the least at 12 months. Maternal and child affect symmetrically reduced 24% of the error in predicting their individual affects at 12 months. The relationship strengthened at 24 months, as the error in prediction increased to 34%, but weakened again to reduce only 25% of the error in prediction at 36 months. When mother affect was used to predict child affect, the prediction error was reduced by 20% at 12 months, 38% at 24 months, and 39% at 36 months ($p \leq .000$ at 24- and 36-months). When child affect was used to predict mother affect, the prediction error was reduced by 27% ($p \leq .002$), 29% ($p \leq .024$), and 12%, respectively, at 12, 24 and 36 months. Interestingly, the error in predicting child affect (using mother affect) was stronger and also stable from 24 to 36 months; the error in predicting mother (using child affect) affect was stronger only at 12 months, but stable from 12 to 24 months.

Table 47
Maternal and Child Affect Ratings at 12 Months

Mother Affect	Child Affect		
	negative	neutral	positive
negative	6	13	
neutral	12	39	9
positive	5	15	27

χ^2 (df = 4) = 32.86, p ≤ .000 symmetric λ = .24, p ≤ .007
mother affect dependent λ = .27, p ≤ .002; child affect dependent λ = .20, p ≤ .060

Table 48
Maternal and Child Affect Ratings at 24 Months

Mother Affect	Child Affect		
	negative	neutral	positive
negative	18	12	3
neutral	13	40	11
positive	2	3	24

χ^2 (df = 4) = 63.11, p ≤ .000 symmetric λ = .34, p ≤ .001
mother affect dependent λ = .29, p ≤ .024; child affect dependent λ = .38, p ≤ .000

Table 49
Maternal and Child Affect Ratings at 36 Months

Mother Affect	Child Affect		
	negative	neutral	positive
negative	5	23	6
neutral	3	33	23
positive	1	3	29

χ^2 (df = 4) = 37.22, p ≤ .000 symmetric λ = .25, p ≤ .004
mother affect dependent λ = .12, p ≤ .30; child affect dependent λ = .39, p ≤ .000

Chi square analyses were used to assess the association between concurrent maternal affect ratings and classifications (Tables 50 - 52), with relationship strength examined as the proportional reduction in error (PRE) as reflected in the symmetric and directional measures of the Lambda association of congruence. As shown in the following table, maternal affect ratings and behavioral classification were significantly related ($p \leq .000$) at all observation periods. Generally, facilitative engaged patterns were associated with positive affect, controlling disengaged patterns with negative affect, and controlling engaged and superficial patterns were associated with neutral affect. The associations increased over time and in relation to the child's age, as did the symmetric and directional lambda measures of congruence. When maternal affect was used to predict mother classification, the prediction error was reduced by 25% at 12 months, 36% at 24 months, and 43% at 36 months (all of which were significant at $p \leq .000$). When maternal classification was used to predict maternal affect, the error in prediction was reduced by 29% at 12 months, by 53% at 24 months, and by 63% at 36 months (all of which were significant at $p \leq .000$). Although both directions of influence were significant at all ages, maternal classification consistently reduced more of the prediction error for maternal affect.

Table 50
Mother Affect and Behavior Classifications at 12 Months

Mother Classification	Mother Affect		
	negative	neutral	positive
facilitative engaged		1	23
controlling engaged		14	14
superficial	6	28	9
controlling disengaged	13	17	1

χ^2 (df = 6) = 71.35 $p \leq .000$ symmetric $\lambda = .29$, $p \leq .000$
mother classif. dependent $\lambda = .25$, $p \leq .002$; affect dependent $\lambda = .33$, $p \leq .000$

Table 51
Mother Affect and Behavior Classifications at 24 Months

Mother Classification	Mother Affect		
	negative	neutral	positive
facilitative engaged		2	22
controlling engaged	4	29	5
superficial	10	27	2
controlling disengaged	19	6	

χ^2 (df = 6) = 114.99, $p \leq .000$ symmetric $\lambda = .43$, $p \leq .000$
mother classif. dependent $\lambda = .36$, $p \leq .002$; affect dependent $\lambda = .53$, $p \leq .000$

Table 52
Mother Affect and Behavior Classifications at 36 Months

Mother Classification	Mother Affect		
	negative	neutral	positive
facilitative engaged		2	23
controlling engaged	1	25	6
superficial	7	27	4
controlling disengaged	36	5	

χ^2 (df = 6) = 131.15, $p \leq .000$ symmetric $\lambda = .52$, $p \leq .000$
mother classif. dependent $\lambda = .43$, $p \leq .000$; affect dependent $\lambda = .63$, $p \leq .000$

The congruence between maternal affect and child classification at concurrent observation periods was assessed using chi square analysis, with relationship strengths examined as the proportional reduction in error (PRE) as reflected in the symmetric and directional measures of the Lambda association of congruence. As shown in the following tables, maternal affect ratings were significantly associated with the child behavior classifications ($p \leq .000$) and the symmetric lambda measures were generally equivalent ($\lambda = .24, .28$ and $.29$, respectively at 12, 24 and 36 months) (Tables 53 - 55). Generally, mothers of engaged assertive children were mostly rated with positive affect and those of active disengaged children were rated with negative affect. Mothers of intermittent engaged and compliant disengaged children were largely rated as neutral, with the latter also obtaining a fair number of negative ratings. When maternal affect was used to predict child classification, the prediction error was reduced by 14% at 12 months, 23% at 24 months ($p \leq .017$), and 20% at 36 months. In contrast, child classification consistently predicted maternal affect, reducing 35% of the prediction error at 12 and 24 months, and 39% at 36 months (all of which were significant at $p \leq .000$). The directional measures suggest that maternal affect was influenced by her child's interaction style. Yet, this finding is interesting in that maternal affect was a stronger predictor of child affect at 24 and 36 months, while maternal classification better predicted child classification at 12 months. Thus, there are complex associations between maternal affect and classification and those of her child.

Table 53
Maternal Affect Ratings and Child Classifications at 12 Months

Child Classification	Mother Affect		
	negative	neutral	positive
engaged assertive		3	24
intermittent engaged	7	38	17
compliant disengaged	9	18	6
active disengaged	3	1	

χ^2 (df = 6) = 53.81, $p \leq .000$ symmetric $\lambda = .25$, $p \leq .005$
child classif. dependent $\lambda = .15$, $p \leq .231$; mother affect dependent $\lambda = .35$, $p \leq .000$

Table 54
Maternal Affect Ratings and Child Classifications at 24 Months

Child Classification	Mother Affect		
	negative	neutral	positive
engaged assertive		6	21
intermittent engaged	11	34	7
compliant disengaged	8	17	1
active disengaged	14	7	

χ^2 (df = 6) = 76.02, $p \leq .000$ symmetric $\lambda = .29$, $p \leq .002$
child classif. dependent $\lambda = .23$, $p \leq .017$; mother affect dependent $\lambda = .36$, $p \leq .001$

Table 55
Maternal Affect Ratings and Child Classifications 36 Months

Child Classification	Mother Affect		
	negative	neutral	positive
engaged assertive		3	21
intermittent engaged	12	39	9
compliant disengaged	13	16	3
active disengaged	9	1	

χ^2 (df = 6) = 81.11, $p \leq .000$ symmetric $\lambda = .29$, $p \leq .000$
child classif. dependent $\lambda = .20$, $p \leq .076$; mother affect dependent $\lambda = .39$, $p \leq .000$

Chi square analyses were then used to examine the association between maternal affect and mutuality ratings at concurrent observation periods (Tables 56 - 58). Once again, the strength of the relationships were examined as the proportional reduction in error (PRE) as reflected in the symmetric and directional measures of the Lambda association of congruence. As shown in the following table, maternal affect and mutuality ratings were significantly related ($p \leq .000$) at all observation periods. Connected dyads had mothers with positive affect ratings, whereas those dyads with some fit had mothers with neutral affect and dyads with poor fit had those with negative affect. The symmetric and both directional lambda measures showed a similar pattern over the three observation periods. All measures were weakest at 12 months, generally equivalent at 24 and 36 months, and were significant at $p \leq .000$. The symmetric lambda increased from reducing prediction error by 24% at 12 months to 52% and 51% at 24 and 36 months respectively. When mother affect was used to predict the mutuality rating, 17 % of the error was reduced at 12 months, increasing to 53% at 24 months, and 46% at 36 months. When the mutuality rating was used to predict maternal affect, 30% of the error was reduced at 12 months, 52% at 24 months, and 55% at 36 months. Maternal affect and dyadic mutuality were closely related and likely tapped a common aspect of the maternal contribution to the dyadic interaction.

Table 56
Maternal Affect and Mutuality Ratings at 12 Months

Mutuality	Maternal Affect		
	negative	neutral	positive
poor	14	16	1
some	5	43	25
connected		1	21

χ^2 (df = 4) = 65.61, p ≤ .000 symmetric λ = .24, p ≤ .000
maternal affect. dependent λ = .30, p ≤ .000; mutuality dependent λ = .17 ,p ≤ .303

Table 57
Maternal Affect and Mutuality Ratings at 24 Months

Mutuality	Maternal Affect		
	negative	neutral	positive
poor	27	11	
some	6	48	8
connected		5	21

χ^2 (df = 4) = 108.97, p ≤ .000 symmetric λ = .52, p ≤ .000
maternal affect dependent λ = .52, p ≤ .000; mutuality dependent λ = .53, p ≤ .000

Table 58
Maternal Affect and Mutuality Ratings at 36 Months

Mutuality	Maternal Affect		
	negative	neutral	positive
poor	23	6	1
some	11	50	9
connected		3	23

χ^2 (df = 4) = 107.57, p ≤ .000 symmetric λ = .51, p ≤ .000
maternal affect dependent λ = .55, p ≤ .000; affect dependent λ = .46, p ≤ .001

The associations between concurrent child affect ratings and classifications were evaluated used in chi square analyses and the strength of the relationships were examined as the proportional reduction in error (PRE) as reflected in the symmetric and directional measures of the Lambda association of congruence. As shown in the following tables, child classification was related to child affect at all observation periods ($p \leq .000$) (Tables 59 - 61). Generally, engaged assertive children mostly had positive affect, active disengaged children tended to be negative, intermittent engaged were positive or neutral, and compliant disengaged children were negative or neutral. Interestingly, many children shifted towards a more positive affect at 36 months. The symmetric lambda measures of congruence were stable from 12 ($\lambda = .38$, $p \leq .001$) to 24 months ($\lambda = .39$, $p \leq .000$), yet decreased at 36 months ($\lambda = .22$, $p \leq .001$). Likewise, when child affect was used to predict child classification, the error was reduced by 39% ($p \leq .001$) of the error at 12 months, 31% ($p \leq .002$) at 24 months, and then markedly decreased to only 5% ($p \leq .254$) at 36 months. A different pattern emerged when child classification was used to predict child affect, as it reduced approximately one third of the error in predicting affect at all ages. The greatest error, 48%, was reduced at 24 months ($p \leq .000$), with 38% reduced at 12 months ($p \leq .001$) and 39% at 36 months ($p \leq .003$). This finding suggests that for toddlers, affect arose out of their interactive behaviors.

Table 59
Child Affect Ratings and Behavior Classifications at 12 Months

Child Classification	Child Affect		
	negative	neutral	positive
engaged assertive		5	22
intermittent engaged	2	46	14
compliant disengaged	19	14	
active disengaged	2	2	

χ^2 (df = 6) = 92.54, $p \leq .000$ symmetric $\lambda = .38$, $p \leq .000$
child classif. dependent $\lambda = .39$, $p \leq .001$; affect dependent $\lambda = .37$, $p \leq .005$

Table 60
Child Affect Ratings and Behavior Classifications at 24 Months

Child Classification	Child Affect		
	negative	neutral	positive
engaged assertive		3	24
intermittent engaged	3	35	14
compliant disengaged	14	12	
active disengaged	16	5	

χ^2 (df = 6) = 103.37, $p \leq .000$ symmetric $\lambda = .39$, $p \leq .000$
child classif. dependent $\lambda = .31$, $p \leq .002$; affect dependent $\lambda = .47$, $p \leq .000$

Table 61
Child Affect Ratings and Behavior Classifications at 36 Months

Child Classification	Child Affect		
	negative	neutral	positive
engaged assertive		1	23
intermittent engaged	2	27	31
compliant disengaged	5	23	4
active disengaged	2	8	

χ^2 (df = 6) = 50.24, $p \leq .000$ symmetric $\lambda = .22$, $p \leq .001$
child classif. dependent $\lambda = .05$, $p \leq .254$; affect dependent $\lambda = .39$, $p \leq .003$

Chi square analyses were used to examine the association between concurrent child affect ratings and maternal behavioral classification and the relationship strengths were examined as the proportional reduction in error (PRE), reflected by symmetric and directional measures of the Lambda association of congruence. Child affect and maternal classification were significantly related at all observation periods ($p \leq .000$) (Tables 62 - 64). Children of facilitative engaged mothers tended to be rated as positive. Children of controlling engaged or superficial mothers were generally neutral, although both shifted towards positive ratings at 36 months; similarly, children of controlling disengaged shifted from negative to neutral at 36 months. The symmetric lambda measure of congruence was strongest at 24 months ($\lambda = .32$, $p \leq .000$) and weaker but comparable at 12 ($\lambda = .23$, $p \leq .001$) and 36 months ($\lambda = .23$, $p \leq .01$). When child affect was used to predict mother classification, the error reductions were 21% ($p \leq .015$) at 12 months, 26% ($p \leq .019$) at 24 months, and 15% ($p \leq .165$) at 36 months. However when maternal classification was used to predict child affect, more of the error in prediction was reduced at all ages. The greatest error, 39%, was reduced at 24 months ($p \leq .000$), with 27% reduced at 12 months ($p \leq .001$) and 33% at 36 months ($p \leq .004$). The influence of maternal interaction style on child affect was apparent throughout toddlerhood, increasing at 24 months in conjunction with the child's ability to express social and eating-related autonomy.

Table 62
Child Affect Ratings and Mother Behavior Classifications at 12 Months

Mother Classification	Child Affect		
	negative	neutral	positive
facilitative engaged		4	20
controlling engaged	4	21	3
superficial	5	26	12
controlling disengaged	14	16	1

χ^2 (df = 6) = 62.21, $p \leq .000$ symmetric $\lambda = .23$, $p \leq .000$
maternal classif. dependent $\lambda = .20$, $p \leq .002$; child affect dependent $\lambda = .27$, $p \leq .000$

Table 63
Child Affect Ratings and Mother Behavior Classifications at 24 Months

Mother Classification	Child Affect		
	negative	neutral	positive
facilitative engaged		3	21
controlling engaged	7	25	6
superficial	10	21	8
controlling disengaged	16	6	3

χ^2 (df = 6) = 66.26, $p \leq .000$ symmetric $\lambda = .32$, $p \leq .000$
maternal classif. dependent $\lambda = .26$, $p \leq .019$; child affect dependent $\lambda = .39$, $p \leq .000$

Table 64
Child Affect Ratings and Mother Behavior Classifications at 36 Months

Mother Classification	Child Affect		
	negative	neutral	positive
facilitative engaged		2	23
controlling engaged	2	17	13
superficial	1	18	19
controlling disengaged	6	22	3

χ^2 (df = 6) = 42.27, $p \leq .000$ symmetric $\lambda = .23$, $p \leq .010$
child classif. dependent $\lambda = .15$, $p \leq .165$; affect dependent $\lambda = .33$, $p \leq .004$

The association between concurrent child affect and the mutuality ratings were examined using chi square analysis, with the strength of the relationships examined as the proportional reduction in error (PRE) reflected by the symmetric and directional measures of the Lambda association of congruence. As shown in Tables 65 - 67, child affect and mutuality ratings were significantly related at all observation periods ($p \leq .000$). The symmetric lambda measure of congruence was markedly strongest at 24 months ($\lambda = .45$, $p \leq .001$) and comparably diminished at 12 ($\lambda = .21$, $p \leq .018$) and 36 months ($\lambda = .22$, $p \leq .000$). When child affect was used to predict the mutuality rating, the error reduction was 42% ($p \leq .001$) at 24 months, and again notably less at 12 months ($\lambda = .17$, $p \leq .057$) and 36 months ($\lambda = .09$, $p \leq .092$). A different pattern emerged when mutuality ratings were used to predict child affect, as 25% or more of the error was reduced at all ages. The greatest error, 47%, was reduced at 24 months ($p \leq .000$), with 25% reduced at 12 months ($p \leq .036$) and 33% at 36 months ($p \leq .000$). Although exaggerated at 24 months, this finding suggests that toddler affect was steadily enhanced by the degree of dyadic negotiation: mutually adaptive dyads had children with positive affect whereas those dyads with poor mutuality had negative affect, until 36 months when about two thirds shifted to neutral. Children from dyads with some mutuality tended to have neutral affect, with about half being positive affect at 36 months.

Table 65
Child Affect and Mutuality Ratings at 12 Months

	Child Affect		
Mutuality Ratings	**negative**	**neutral**	**positive**
poor	16	15	
some	7	48	18
connected		4	18

χ^2 (df = 4) = 64.37, $p \leq .000$ symmetric $\lambda = .22$, $p \leq .018$
mutuality dependent $\lambda = .17$, $p \leq .057$; child affect dependent $\lambda = .254$, $p \leq .036$

Table 66
Child Affect and Mutuality Ratings at 24 Months

	Child Affect		
Mutuality Ratings	**negative**	**neutral**	**positive**
poor	25	11	2
some	8	41	13
connected		3	23

χ^2 (df = 4) = 87.79, $p \leq .000$ symmetric $\lambda = .45$, $p \leq .000$
mutuality dependent $\lambda = .42$, $p \leq .001$; affect dependent $\lambda = .48$, $p \leq .000$

Table 67
Child Affect and Mutuality Ratings at 36 Months

	Child Affect		
Mutuality Ratings	**negative**	**neutral**	**positive**
poor	7	19	4
some	2	38	30
connected		2	24

χ^2 (df = 4) = 44.97, $p \leq .000$ symmetric $\lambda = .22$, $p \leq .000$
mutuality dependent $\lambda = .09$, $p \leq .092$; child affect dependent $\lambda = .32$, $p \leq .000$

Summary of the Examination of Reliability and Stability

The reliability of the Snack Scale was examined using several statistical tests. Interrater reliability was established using percent agreement and Cohen's kappa. The internal validity of the coding scheme was examined using discriminant analysis, which provided evidence that the behavioral frequencies differentiated the Snack Scale classifications of maternal and child interactive styles. The nominal level measurement of the Snack Scale classifications was confirmed using proportions of behavioral frequencies in relation to the classifications of maternal and child interative styles. Then the stability and congruence of the Snack Scale measures were tested using chi square analyses. The results of all statistical tests indicated that the observational scheme was a reliable measure.

Validity

This section examined the second aim, the validity of the Snack Scale, by considering both convergent and construct validity. Convergent validity was considered first, using two observational tools from the larger study which measured similar concepts. Construct validity was considered next, examining relationships between the Snack Scale classifications and measures of social competence during toddlerhood.

Convergent Validity

Two observational measures used in the larger study were used to examine convergent validity. The Control Autonomy Balance Scale (CABS) was used to assess the balance between maternal directiveness and contingent responsiveness, and child autonomy and engagement, as well as dyadic mutual adaptiveness, manifested in the

autonomy and engagement, as well as dyadic mutual adaptiveness, manifested in the context of play. The Snack Scale taps similar dimensions of maternal control (directiveness) and responsiveness (sensitivity and contingency) as well as child autonomy and engagement in the context of an eating episode. The second tool, the Nursing Child Assessment Teaching Scale (NCATS), assesses the quality of mother-child interactive patterns in a brief teaching interaction. The NCATS measures of parent, child and dyadic interactive quality were expected to differ according to the Snack Scale mother, child, dyadic classifications and ratings of dyadic mutuality.

Convergent validity examined with the CABS. Chi square analysis was used to assess associations between the CABS classifications and those the Snack Scale. Maternal classifications in snack were assessed in relation to those in play (CABS) as were child classifications, at 12, 24 and 36 months. In addition, dyadic styles assigned in play were assessed in relation to those assigned in the context of eating.

The associations between concurrent maternal classifications assigned with the CABS and the Snack Scale were examined at the child's ages of 12, 24 and 36 months. The two sets of maternal classifications were significantly related at all observation periods (χ^2 (df = 9) = 34.56, $p \leq .000$ at 12 months; χ^2 (df = 9) = 20.99, $p \leq .013$ at 24 months; χ^2 (df = 9) = 19.86, $p \leq .019$ at 36 months). Thus, although the classification assignments were made in distinct interactive contexts, the CABS and Snack Scale similarly distinguished maternal interactive styles (Table 68). Mothers who were sensitive nondirective in play tended to be facilitative in the snack setting (facilitative engaged or superficial) in contrast to those who were intrusive in play -- they tended to be controlling

in snack (controlling engaged or controlling disengaged). Controlling directive mothers in play were largely disengaged in snack (superficial or controlling disengaged). Mothers who were sensitive directive in play were either controlling engaged or superficial, an unusual split.

Table 68
Maternal Classifications: Associations between the Snack Scale and Control Autonomy Balance Scale at 12, 24 and 36 Months

CABS (play scale) at 12 Months	Snack Scale at 12 Months			
	facilitative engaged	controlling engaged	superficial	controlling disengaged
sensitive nondirective	14	6	13	2
sensitive directive	4	11	10	13
controlling directive	5	9	17	17
intrusive	1	2	3	9

χ^2 (df = 9) = 34.56, p ≤ .000

CABS (play scale) at 2 Months	Snack Scale at 24 Months			
	facilitative engaged	controlling engaged	superficial	controlling disengaged
sensitive nondirective	12	9	14	1
sensitive directive	6	12	5	6
controlling directive	4	10	16	13
intrusive	2	7	4	5

χ^2 (df = 9) = 20.99, p ≤ .013

CABS (play scale) at 36 Months	Snack Scale at 36 Months			
	facilitative engaged	controlling engaged	superficial	controlling disengaged
sensitive nondirective	9	8	11	1
sensitive directive	9	13	11	7
controlling directive	6	7	14	18
intrusive	1	4	2	5

χ^2 (df = 9) = 19.86, p ≤ .019

Chi square analysis was used to examine the associations between concurrent child classifications assigned with the CABS (play) and the Snack Scale (snack) at the child's ages of 12, 24 and 36 months (Table 69). The two sets of child classifications were significantly related only at the 36 months observation period (χ^2 (df = 9) = 21.67, $p \leq .010$). Unlike the maternal classifications, the CABS and Snack Scale did not distinguish child interactive styles at 12 and 24 months. At 36 months, children who were engaged assertive in the snack setting were most likely to be engaged autonomous in play. In contrast, those who were disengaged during snack -- compliant or active -- were avoidant compliant or ignoring in joint play. Those children who were intermittently engaged with their mothers during snack were largely engaged during play with their mothers: two thirds were engaged autonomous or engaged nonautonomous and another third were avoidant compliant. At 36 months, then, the salient dimension of engagement was relatively stable across interactive settings.

Table 69
Child Classifications: Associations between Play and Snack Scales at 36 Months

CABS (play scale)	Snack Scale			
	engaged assertive	intermittent engaged	compliant disengaged	active disengaged
engaged nonautonomous	14	30	6	1
engaged autonomous	4	10	6	1
avoidant compliant	3	17	14	5
ignoring	3	3	6	3

χ^2 (df = 9) = 21.67, $p \leq .010$

Chi square analysis was also used to examine the associations between the dyadic style assigned with the CABS (play) and with the Snack Scale (eating). The two sets of

dyadic styles were significantly related at all observation periods (χ^2 (df = 9) = 33.06, $p \leq .000$ at 12 months; χ^2 (df = 9) = 23.65, $p \leq .005$ at 24 months; χ^2 (df = 9) = 18.27, $p \leq .032$ at 36 months). As summarized in Tables 70 - 72, dyads comprised of sensitive mothers with engaged children in play tended to be dyads of facilitative engaged or superficial mothers with engaged or compliant children during snack; over time, some mothers became controlling engaged during snack. The dyadic play group comprised of sensitive directive mothers with engaged children tended to have dyadic patterns of controlling engaged mothers with engaged or compliant children in snack; at 12 months, some mothers were superficial yet facilitative engaged at 36 months. The dyads comprised of controlling mothers with avoidant compliant children during play tended to have dyadic patterns of superficial or controlling disengaged mothers with compliant or intermittently engaged children during snack; some mothers became controlling engaged during snack at 24 and 36 months. The dyadic play group of controlling mothers with ignoring children tended to be controlling disengaged mothers with disengaged or intermittently engaged children during snack yet, at 12 and 36 months, many of the mothers were superficial and the children were compliant; at 24 months, many mothers were controlling engaged and children engaged or compliant. Thus, although the assignments of dyadic styles were made in distinct contexts, the CABS and Snack Scale distinguished similar interactive characteristics of the mother-child dyads.

Table 70
Dyadic Style: Associations between Play and Snack Scales at 12 Months

	Snack Scale			
CABS (play)	**facil. engaged-engaged**	**control engaged-engaged/complt.**	**superficial-complt./intermit.**	**control disengage-disengaged/intermit.**
sensitive-engaged	14	6	12	2
sensitive/ directive-engaged	4	11	10	3
control-avoidant/complt.	5	10	14	18
control-ignoring	1	1	7	8

χ^2 (df = 9) = 33.06, $p \leq .000$

Table 71
Dyadic Style: Associations between Play and snack Scales at 24 Months

	Snack Scale			
CABS (play)	**facil. engaged-engaged**	**control engaged-engaged/complt.**	**superficial-complt./intermit.**	**control disengaged-disengaged/intermit.**
sensitive-engaged	12	9	14	1
sensitive/ directive-engaged	6	12	5	6
control-avoidant/complt.	4	9	17	12
control-ignoring	2	9	3	5

χ^2 (df = 9) = 23.65, $p \leq .005$

Table 72
Dyadic Style: Associations between Play and Snack Scales at 36 Months

	Snack Scale			
CABS (play)	**facil. engaged-engaged**	**control engaged-engaged/complt.**	**superficial-complt./intermit.**	**control disengage-disengaged/intermit.**
sensitive-engaged	9	8	11	2
sensitive/ directive-engaged	9	13	11	7
control-avoidant/complt.	4	10	10	16
control-ignoring	3	1	5	7

χ^2 (df = 9) = 18.27, $p \leq .032$

The associations between the dyadic fit ratings assigned with the CABS (play) and with ratings of dyadic mutuality assigned with the Snack Scale (eating) were examined using chi square analyses. The two sets of dyadic ratings were significantly associated at12 (χ^2 (df = 18) = 38.91, $p \leq .003$) and 36 months (χ^2 (df = 4) = 14.88, $p \leq .005$). At 12 months, poorly-fitting dyads in play tended to manifest some or connected mutuality during snack; the "middle" dyads were rated similarly in play and snack, while well-fitting dyads in play had some or connected mutuality during snack (Tables 73 - 74). The associations shifted at 36 months, as dyads with a poor fit in play manifested poor or some mutuality during snack; dyads with some fit in play were predominantly rated as having some mutuality during snack; and connected dyads in play tended to manifest poor-fit or some mutuality during snack ~~(Table 68)~~. Thus, although the ratings of dyadic fit and mutuality made in the play and snack context were associated at some observation periods, dyadic negotiation and mutuality and were context dependent for many dyads at 24 months and for several at 12 and 36 months.

Table 73
Dyadic Mutuality: Associations between Play and Snack Scales at 12 Months

	Snack Scale		
CABS (play)	**poor**	**some**	**connected**
poor	5	8	6
marginal	2	19	10
connected	2	32	42

χ^2 (df = 4) = 24.81, $p \leq .000$

Table 74
Dyadic Mutuality: Associations between Play and Snack Scales at 36 Months

	Snack Scale		
CABS (play)	**poor**	**some**	**connected**
poor	12	12	4
marginal	15	25	10
connected	33	33	12

χ^2 (df = 4) = 14.88, $p \leq .005$

Chi square analysis assessed the associations between ratings of maternal affect assigned with the CABS (play) and with the Snack Scale (eating). The two sets of ratings were significantly linked at two observation periods: χ^2 (df = 4) = 12.87, $p \leq .012$, at 12 months (Tables 75) and χ^2 (df = 4) = 22.85, $p \leq .000$, at 36 months (Table 76). Maternal affect rated as negative in play tended to be neutral during snack; neutral affect in play was negative or neutral during snack; positive affect in play was neutral or positive during snack. Thus, the CABS and Snack Scale similarly distinguished maternal affect in distinct interactive contexts at specific observation periods, with mismatches occurring between neutral and positive ratings.

Table 75
Mother Affect Ratings: Associations between Play and Snack Scales at 12 Months

CABS (play)	Snack Scale		
	negative	neutral	positive
negative	3	8	3
neutral	9	13	6
positive	7	39	38

χ^2 (df = 4) = 12.87, $p \leq .012$

Table 76
Mother Affect Ratings: Associations between Play and Snack Scales at 36 Months

CABS (play)	Snack Scale		
	negative	neutral	positive
negative	9	11	
neutral	13	7	5
positive	12	41	28

χ^2 (df = 4) = 22.85, $p \leq .000$

The associations between child affect ratings assigned by the CABS (play) and by the Snack Scale (eating) were assessed using chi square analyses (Tables 77 - 79). The two sets of ratings were significantly related across observation periods (χ^2 (df = 4) = 10.11, $p \leq .039$ at 12 months; χ^2 (df = 4) = 16.17, $p \leq .003$ at 24 months; χ^2 (df = 4) = 17.35, $p \leq .002$ at 36 months). Children rated as having negative affect in play were generally neutral during snack. Those rated as neutral in play tended to be neutral in snack, with a fair number rated as positive; positive ratings in play were generally neutral or positive during snack. Like maternal affect, the CABS and Snack Scale generally distinguished similar ratings of child affect, with mismatches occurring between neutral and positive ratings.

Table 77
Child Affect Ratings: Associations between Play and Snack Scales at 12 Months

	Snack Scale		
CABS (play)	**negative**	**neutral**	**positive**
negative	8	17	2
neutral	9	28	15
positive	6	22	19

χ^2 (df = 4) = 10.11, p ≤ .039

Table 78
Child Affect Ratings: Associations between Play and Snack Scales at 24 Months

	Snack Scale		
CABS (play)	**negative**	**neutral**	**positive**
negative	10	13	5
neutral	12	15	3
positive	11	27	30

χ^2 (df = 4) = 16.17, p ≤ .003

Table 79
Child Affect Ratings: Associations between Play and Snack Scales at 36 Months

	Snack Scale		
CABS (play)	**negative**	**neutral**	**positive**
negative	5	8	6
neutral	2	19	10
positive	2	32	42

χ^2 (df = 4) = 17.35, p ≤ .002

Convergent validity examined with the NCATS

Convergent validity was also examined using analysis of variance (ANOVA) with the Nursing Child Assessment Teaching Scale (NCATS) scores as the dependent variable. Mother classifications from the SS were assessed in relation to concurrent maternal total and contingency scores in teaching (NCATS); likewise, child classifications from the Snack Scale were assessed in relation to concurrent child total and contingency scores in teaching (NCATS). The dyadic interactive style and mutuality ratings from the Snack Scale were assessed in relation to the total dyadic score and combined maternal and child contingency scores in teaching.

Analysis of variance was used to assess the differences between the maternal classifications assigned using the Snack Scale (eating) in terms of the concurrent maternal NCATS (teaching) scores. The caregiver total score was entered as the dependent variable with Snack Scale classification as the grouping variable. As shown in Table 80, the NCATS total caregiver score was modestly differentiated by the Snack Scale maternal classifications at all observation periods (F (3,122) = 5.57, $p \leq .001$ at 12 months; F (3,110) = 6.04, $p \leq .001$ at 24 months; F (3,102 = 4.10, $p \leq .009$ at 36 months). When the analysis was carried out using the caregiver contingency scores as the dependent variable, the NCATS scores differentiated the Snack Scale maternal classifications at 12 and 36 months (F (3,122) = 3.02, $p \leq .032$ at 12 months; F (3,110) = 2.08, $p = .107$ at 24 months; F (3,102 = 5.20, $p = .002$ at 36 months). Although the measurements were made in different interactive episodes, similar distinctions were found on the basis of the overall maternal interactive quality (NCATS caregiver total score and Snack Scale

classification) and contingent responsiveness (NCATS caregiver contingency score and Snack Scale classification). The pattern of means, for both total quality and contingency, were the same at every observation (facilitative engaged > controlling engaged > superficial > controlling disengaged) except at 12 months when the superficial mothers had the lowest mean total quality and contingency. Thus, maternal classifications differed in the expected ways with respect to interactive quality and contingency responsiveness.

Table 80
NCATS Caregiver Means by Snack Scale Maternal Classifications

	Snack Scale Mother Classifications			
	facilitative engaged	**controlling engaged**	**superficial**	**controlling disengaged**
Total Quality				
12 months (N = 126)	M = 39.21 S.D. = 3.50 n = 24	M = 37.93 S.D. = 4.06 n = 28	M = 35.21 S.D. = 5.18 n = 43	M = 36.19 S.D. = 3.17 n = 31
24 months (N = 114)	M = 40.83 S.D. = 2.50 n = 24	M = 38.71 S.D. = 3.42 n = 38	M = 38.10 S.D. = 2.94 n = 39	M = 37.00 S.D. = 3.52 n = 25
36 months (N = 106)	M = 38.74 S.D. = 3.59 n = 19	M = 38.07 S.D. = 4.48 n = 28	M = 35.55 S.D. = 4.63 n = 31	M = 35.21 S.D. = 4.43 n = 28
Caregiver Contingency				
12 months (N = 126)	M = 58.08 S.D. = 5.23	M = 56.25 S.D. = 5.20	M = 53.56 S.D. = 7.22	M = 55.07 S.D. = 5.93
24 months (N = 114)	M = 59.63 S.D. = 4.5	M = 57.18 S.D. = 6.10	M = 56.64 S.D. = 5.34	M = 55.76 S.D. = 6.40
36 months (N = 106)	M = 55.32 S.D. = 3.62	M = 53.82 S.D. = 5.34	M = 50.90 S.D. = 5.08	M = 50.41 S.D. = 4.89

Analysis of variance was used to assess differences between the child classifications (assigned using the Snack Scale) with the concurrent child NCATS scores.

The child total score served as the dependent variable with Snack Scale classification as the grouping variable. The NCATS child total score did not differ by the Snack Scale child classification at any observation period. When the analysis was carried out using the child contingency score as the dependent variable, there were again no significant differences between Snack Scale child classification at any observation period. Thus, no relationship was found between the two measures of the child's overall interactive quality (NCATS child total score and Snack Scale classification), nor was a relationship found between the two measures of child responsiveness.

Analysis of variance was also used to assess the differences between the child classifications assigned using the Snack Scale (eating) in terms of the concurrent maternal NCATS scores. The caregiver total score served as the dependent variable with Snack Scale classification as the grouping variable. The NCATS total caregiver score trended towards significantly differentiating the Snack Scale child classifications at 12 months $\underline{F}$ (3,122) = 2.51, $\underline{p}$ = .062) and at 24 months ($\underline{F}$ (3,110) = 2.92, $\underline{p}$ = .037). When the analysis was carried out using the caregiver contingency score as the dependent variable, the child classifications were significantly differentiated by the Snack Scale child classifications at 36 months ($\underline{F}$ (3,102) = 3.22, $\underline{p}$ = .026). The overall maternal interactive quality in a teaching episode differed according to the child's interactive behavior pattern during snack at 12 and 24 months and contingent responsiveness at 36 months. The pattern of means for total maternal quality were the same at 12 and 24 months: engaged assertive > intermittent engaged > compliant disengaged > active disengaged. Interestingly, a different pattern of means was found for maternal contingent

responsiveness at 36 months: engaged assertive < compliant disengaged < intermittent engaged < active disengaged (Table 81). Thus, while the NCATS measures of child interactive quality did not differentiate the child classifications assigned with the Snack Scale, the child classifications were differentiated by the NCATS measures of maternal interactive quality. Such findings suggest that maternal interactive quality, as assessed using the NCATS in a teaching episode, influences the child's interactive behavior in other settings.

Table 81
NCATS Caregiver Means by Snack Scale Child Classifications

	Snack Scale Child Classifications			
	engaged assertive	**intermitt. engaged**	**compliant disengaged**	**active disengaged**
Caregiver Total Quality				
12 months (N = 126)	M = 38.81 S.D. = 4.01 n = 27	M = 36.39 S.D. = 4.79 n = 62	M = 36.18 S.D. = 3.76 n = 33	M = 35.25 S.D. = 3.40 n = 4
24 months (N = 114)	M = 40.15 S.D. = 2.81 n = 27	M = 38.54 S.D. = 3.35 n = 52	M = 37.89 S.D. = 2.22 n = 26	M = 37.57 S.D. = 4.46 n = 21
Caregiver Contingency				
36 months (N = 106)	M = 55.45 S.D. = 3.58 n = 20	M = 36.14 S.D. = 4.48 n = 49	M = 36.96 S.D. = 4.74 n = 28	M = 34.44 S.D. = 5.41 n = 9

The analysis was conducted again to assess the differences between the maternal classifications assigned using the Snack Scale (eating) in terms of the concurrent child NCATS scores. The child total score served as the dependent variable with Snack Scale maternal classification as the grouping variable. The NCATS child total score did not differ by the Snack Scale maternal classification at any observation period. When the

analysis was carried out using the child contingency score as the dependent variable, there were again no significant differences between Snack Scale maternal classification at any observation period. Thus, no relationship was found between the NCAST measure of the child's overall interactive quality or responsiveness in a teaching episode and maternal interactive patterns during snack.

The differences between the dyadic interactive styles from the Snack Scale were assessed in relation to the total (dyadic) NCATS score and the combined contingency scores. When the total score was entered as the dependent variable with concurrent dyadic style as the grouping variable, the NCATS teaching score differed according to the Snack Scale dyadic styles at 12 months (F (3,122) = 3.02, p = .032) and 36 months (F (3,102 = 5.19, p = .002). When the analysis was carried out using the combined contingency score as the dependent variable, again the NCATS combined contingency score differed according to Snack Scale dyadic styles at 12 months (F (3,118) = 2.99, p = .034) and 36 months (F (3,102 = 4.45, p = .006). Thus, only at 12 and 36 months were similar distinctions found on the basis of the overall dyadic interactive quality (NCATS total score and Snack Scale dyadic style) and overall contingent responsiveness (NCATS combined continency score and Snack Scale dyadic style). The pattern of means, for both dyadic quality and contingency, were the same at every observation (facilitative engaged/engaged > controlling engaged/engaged + compliant > controlling disengaged /disengaged + intermittent > superficial/compliant + intermittent) (see Table 82). The means varied according to the quality of mother-directed interactions and the degree of child engagement. The two dyadic styles characterized by maternal and child engagement

(facilitative engaged/engaged and controlling engaged/engaged + compliant) had higher indicators of dyadic quality and mutual contingency. The dyadic style characterized by maternal disengagement and control (controlling disengaged /disengaged + intermittent) was associated with a higher dyadic quality than was the dyadic style characterized by disengagement without control (superficial/compliant + intermittent), although the difference was diminished by 36 months.

Table 82
Relationships between Snack Scale Dyadic Interactive Style and NCATS Scores

	Dyadic Interactive Style			
	mother facil. engaged/child engaged	**mother control engaged/child engaged+complt.**	**mother superficial/child complt.+intermit**	**mother control disengaged/child disengaged+intermit.**
Total Dyadic Quality				
12 months (N = 126)	M = 58.08 S.D. = 5.26 n = 24	M = 56.25 S.D. = 5.2 n = 28	M = 53.56 S.D. = 7.22 n = 43	M = 55.07 S.D. = 5.93 n = 31
36 months (N = 106)	M = 55.32 S.D. = 3.62 n = 19	M = 53.82 S.D. = 5.34 n = 28	M = 50.73 S.D. = 5.07 n = 30	M = 50.86 S.D. = 4.90 n = 29
Dyadic Contingency				
12 months (N = 126)	M = 68.57 S.D. = 5.55	M = 65.51 S.D. = 6.52	M = 62.6 S.D. = 8.74	M = 64.61 S.D. = 8.03
36 months (N = 106)	M = 62.58 S.D. = 4.27	M = 61.11 S.D. = 6.42	M = 57.50 S.D. = 5.74	M = 58.00 S.D. = 5.81

To assess the differences between the mutuality ratings assigned using the Snack Scale on the total (dyadic) score and combined contingency scores in teaching, ANOVA was conducted again. For this analysis, the total score was entered as the dependent variable with concurrent dyadic fit rating as the grouping variable. The NCATS total teaching score differed significantly according to the Snack Scale mutuality ratings at all observation periods, with the differences becoming slightly more robust with the child's increasing age (F (2,103) = 3.05, p = .051 at 12 months; F (2,103) = 3.28, p = .041 at 24 months; F (2,103) = 3.77, p = .026 at 36 months). The analysis was carried out again with the combined continency score entered as the dependent variable. The NCATS contingency score significantly differed by Snack Scale dyadic mutuality ratings at 12 months (F (2,119) = 3.48, p = .034) and trend towards differences at 36 months (F (2,103)

= 2.88, p = .061). The pattern of means, for both total quality and contingency, differed according to the quality of the mutuality rating at every observation (connected > some > poor). As expected, connected dyads had the highest dyadic quality and contingent responsiveness and dyads with poor mutuality had the lowest quality and responsiveness (Table 83).

Table 83
Mean of NCATS Scores by Mutuality Ratings

	Mutuality		
	poor	**some**	**connected**
Total Dyadic Quality			
12 months (N = 126)	M = 54.03 S.D. = 6.70 n = 31	M = 55.12 S.D. = 6.18 n = 72	M = 58.18 S.D. = 5.46 n = 19
24 months (N = 114)	M = 55.66 S.D. = 6.70 n = 38	M = 57.23 S.D. = 5.68 n = 62	M = 59.12 S.D. = 4.43 n = 26
36 months (N = 106)	M = 50.63 S.D. = 4.88 n = 27	M = 52.44 S.D. = 5.26 n = 59	M = 54.70 S.D. = 4.47 n = 20
Dyadic Contingency			
12 months (N = 126)	M = 63.23 S.D. = 8.73	M = 64.38 S.D. = 7.60	M = 68.90 S.D. = 5.72
36 months (N = 106)	M = 64.65 S.D. = 5.78	M = 66.78 S.D. = 6.21	M = 69.77 S.D. = 5.02

Construct Validity

Construct validity was examined by considering how mother-child interactive behaviors contribute to variations in child social competence during toddlerhood. One-way ANOVA was used to compare the four mother classifications and the four child

classifications on social competence, as measured by the Adaptive Social Behavior Inventory (ASBI). ANOVAs were computed at each age (12, 24, and 36 months) as well as using earlier mother and child classifications with later social competence (e.g., 12-month mother classifications with social competence at 24 and 36 months).

Assessments of construct validity using concurrent measures. Analysis of variance was used to assess the differences between the Snack Scale maternal classifications with respect to the concurrent ASBI scores. The ASBI total score served as the dependent variable with the maternal classification as the grouping variable. The child's total social competence did not differ by maternal classification at any observation period.

The analysis was carried out again using the ASBI express, comply and disrupt subscale scores as dependent variables with maternal classification as the grouping variable. Child expressiveness and compliance did not differ according to maternal classification at 12 months, nor did compliance and disruptivenss at 24 months; none of the ASBI subscales differed in relation to maternal classification at 36 months.

At 24 months, child expressiveness differed according to maternal classification ($F(3,122) = 3.15$, $p \leq .028$). In comparison with facilitative engaged mothers, controlling disengaged mothers had a strong negative effect on child expressiveness at 24 months (E.S. = -.73); engaged-controlling mothers (E.S. = -.69) and superficial mothers had a similar moderately-strong negative effect (E.S. = -.64) on expressiveness. As shown in Table 84, the means varied as expected (facilitative engaged > controlling engaged > superficial > controlling disengaged). Interestingly, the effect size showed a relative lack of variance between the three classifications.

Child disruptiveness differed according to maternal classification at 12 months (F (3,122) = 3.92, p = .01). In comparison with facilitative engaged mothers, controlling disengaged mothers had a strong negative effect on child disruptiveness (E.S. = -.81) as their children displayed more disruptiveness; engaged controlling mothers had a moderately negative effect (E.S. = -.47) and superficial mothers had a weak negative effect (E.S. = -.28). While the results of the disrupt subscale assessment must be interpreted with caution (as its α = .46), the pattern of the effect size suggests that maternal control influences child disruptiveness at 12 months (facilitative engaged > superficial > controlling engaged > controlling disengaged) (Table 84).

Table 84
ASBI Subscale Means by Mother Classifications

	Snack Scale Mother Classification			
	facilitative engaged	**controlling engaged**	**superficial**	**controlling disengaged**
Express subscale				
24 months	M = 35.29 S.D. = 2.71 n = 24	M = 34.53 S.D. = 3.51 n = 38	M = 33.33 S.D. = 3.22 n = 39	M = 32.60 S.D. = 4.47 n = 25
Disrupt subscale				
12 months	M = 9.04 S.D. = 1.20 n = 24	M = 9.43 S.D. = 1.53 n = 28	M = 9.70 S.D. = 1.52 n = 43	M = 10.48 S.D. = 2.11 n = 31

Analysis of variance was used to assess the differences between child classifications with respect to the concurrent ASBI scores. The ASBI total score was entered as dependent variables with Snack Scale child classification as the grouping

variable. The child's social competence did not differ by child classification at any observation period.

The analysis was repeated to assess the effect of child classification assignment on concurrent expressiveness, compliance and disruptiveness; only child expressiveness differed according to child classification in later toddlerhood. At 24 months, child expressiveness differed according to child classification (F (3,122) = 3.46, p = .019). The means on the expressiveness subscale differed as expected (Table 85). In comparison with engaged assertive children, assignment to the active disengaged classification had a strong negative effect on expressiveness (E.S. = -.83); assignment to the compliant disengaged classification had a moderately-strong negative effect (E.S. = -.69) and assignment to the intermittent engaged classification a weak negative effected (E.S. = -.25). Child expressiveness continued to differ according to child classification at 36 months (F (3,122) = 2.66, p = .051). Children assigned to an engaged classification (engaged assertive or intermittently engaged) scored similarly on the expressiveness scale. In comparison with engaged children, assignment to the active disengaged classification had a moderately-strong negative effect on expressiveness (E.S. = -.65) while assignment to the compliant disengaged classification had a moderate-weak negative effected (E.S. = -.35).

Table 85
ASBI Subscale Means by Child Classifications

	Child Classification			
	engaged assertive	**intermittent engaged**	**compliant disengaged**	**active disengaged**
Express subscale				
24 months	M = 35.19 S.D. = 2.73 n = 27	M = 34.38 S.D. = 3.41 n = 52	M = 32.69 S.D. = 4.32 n = 26	M = 32.67 S.D. = 3.43 n = 21
36 months	M = 35.71 S.D. = 2.92 n = 24	M = 35.72 S.D. = 2.68 n = 60	M = 34.78 S.D. = 2.79 n = 32	M = 33.20 S.D. = 4.94 n = 10

Differences between the derived dyadic styles and the concurrent ASBI scores were assessed using ANOVA. The analyses were carried out using the ASBI scores as the dependent variable with the concurrent dyadic style as the grouping variable. The results showed that the dyadic styles did not differentiate the means of the ASBI total or any of the subscale scores at any observation period.

Analysis of variance was then used to assess the differences between the Snack Scale mutuality ratings and the concurrent ASBI scores. The ASBI scores were entered as dependent variables with the concurrent mutuality rating as the grouping variable. Three differences were found with regard to the ASBI subscale scores in relation to the mutuality ratings across toddlerhood. First, the scores on the total ASBI at 12 months differed according to the mutuality rating (F (2,120) = 3.65, p = .029). As shown in Table 86, the means differed as expected. When compared with children of connected dyads, membership in a dyad with poor mutuality had a strong negative effect on overall social competence at 12 months (E.S. = -.74) while membership in a dyad with some mutuality

had a moderate negative effect (E.S. = -.40). Likewise, the mutuality rating differentiated the mean scores on the express subscale at 24 months (F (,120) = 3.15, p = .046). In comparison with the children of connected dyads, membership in a dyad with poor mutuality had a strong negative effect on child expressiveness at 24 months (E.S. = -.63) and membership in a dyad with some mutuality had a moderate negative effect (E.S. = -.39). The disrupt subscale, which requires a cautious interpretation, yielded a similar pattern of means at 12 months. Finally, the mean scores on the disrupt scale differed according to mutuality ratings at 12 months (F (2,120) = 5.08, p = .008). In comparison with the children of connected dyads, membership in a dyad with poor mutuality had a strong negative effect on disruptiveness, i.e., more disruptiveness, at 12 months (E.S. = .83) and membership in a dyad with some mutuality had a moderate negative effect (E.S. = .41).

Table 86
ASBI Subscale Means by Mutuality Ratings

	Mutuality		
	poor	**some**	**connected**
ASBI total scale			
12 months	M = 61.07 S.D. = 6.55 n = 31	M = 63.13 S.D. = 6.13 n = 73	M = 65.73 S.D. = 5.88 n = 22
Express subscale			
24 months	M = 32.97 S.D. = 4.06 n = 38	M = 33.95 S.D. = 3.50 n = 62	M = 35.23 S.D. = 2.67 n = 26
Disrupt subscale			
12 months	M = 10.42 S.D. = 1.98 n = 31	M = 9.62 S.D. = 1.59 n =73	M =9.00 S.D. = 1.23 n =22

Assessments of construct validity manifested over time. Analysis of variance was used to assess the differences between the Snack Scale maternal classifications and the subsequent ASBI total and express, comply, disrupt, and prosocial subscale scores. In this way, the maternal classification was assessed as an influence on future social competence. The ASBI scores were entered as subsequent dependent variables with the classification as the factor variable (e.g., 12 month maternal classification with 24 month ASBI scores). The results showed that the maternal classifications did not differentiate the means of the subsequent ASBI scores at any interval.

Analysis of variance was the used to assess the differences between the Snack Scale child classifications and the subsequent ASBI total scores as were the express, comply, disrupt, and prosocial subscale scores. In this way, the child classification was assessed as an influence on future social competence. The ASBI scores were entered as dependent variables with the previous classification as the grouping variable (e.g., 12 month child classification with 24 month ASBI score). The results showed that child classifications did not differentiate the means of the subsequent ASBI scores at any interval.

Next, analysis of variance was used to assess the relationship between the Snack Scale assignments of dyadic styles and the subsequent ASBI total and express, comply, disrupt, and prosocial subscale scores. In this way, the dyadic interactive style was assessed as an influence on future social competence. The ASBI score was entered as the dependent variable with the subsequent dyadic style as the grouping variable (e.g., 12 month dyadic style with 24 month ASBI scores). The results showed that the assignment

of dyadic style did not differentiate the means of the subsequent ASBI scores at any interval.

To assess the differences between the Snack Scale mutuality ratings and the subsequent ASBI scores, analysis of variance was used once more. In this way, the dyadic mutuality was assessed as an influence on future social competence (e.g., 12 month mutuality rating with 24 month social competence). The ASBI score was entered as the dependent variable with the mutuality rating as the grouping variable. The mean scores on the ASBI total scale differed according to the dyadic fit rating at 12 months ($\underline{F}$ (2,123) = 7.62, $\underline{p}$ = .001) (Table 87). In comparison with the children of connected dyads, membership in a dyad with poor mutuality at 12 months had a strong negative effect on overall social competence at 24 months (E.S. = -.79) and membership in a dyad with some mutuality had a negligible effect (E.S. = -.14). Thus, poor dyadic mutuality in the first year was a strong predictor of diminished social competence in the second year.

Likewise, assessment of the express subscale at 24 months found the mean scores differed according to the mutuality rating at 12 months ($\underline{F}$ (2,123) = 5.48, $\underline{p}$ = .005) (Table 87). In comparison with the children of connected dyads, membership in a dyad with poor mutuality at 12 months had a strong negative effect on expressiveness at 24 months (E.S. = -.69) while membership in a dyad with some mutuality had a negligible effect (E.S. = -.18). Poor dyadic mutuality in the first year was a strong predictor of diminished expressiveness in the second year. No differences were found between any of the ASBI scores at 36 months in relation to the previous mutuality rating.

Table 87
Mutuality Ratings and Subsequent Mean ASBI Scores

	Mutuality at 12 months		
	poor	**some**	**connected**
ASBI total scale at 24 months	M = 68.61 S.D. = 6.64 n = 31	M = 72.73 S.D. = 4.73 n = 73	M = 73.41 S.D. = 5.22 n = 22
Express subscale at 24 months	M = 32.16 S.D. = 4.58	M = 34.37 S.D. = 3.06	M = 34.91 S.D. = 2.93

Summary of the examination of validity

The validity of the Snack Scale was established as both convergent and construct validity. Evidence for convergent validity was provided using observational measures which assessed similar qualities in maternal, child and dyadic behaviors. Chi square analysis was used to demonstrate associations between the classifications and ratings assigned with the Snack Scale and those assigned with the CABS in the context of play. ANOVA was used to demonstrate that the NCATS measures of maternal, child and dyadic qualities (overall interactive quality and contingency) differed in relation to the Snack Scale classifications of mother, child, dyad, and ratings of dyadic mutuality. Construct validity was established using ANOVA to demonstrate that the outcome of interest, child social competence in other settings, differed in relation to the Snack Scale classifications of maternal and child interactive styles and dyadic mutuality. Effect sizes were calculated for the concurrent Snack Scale measures and ASBI scores as well as for the Snack Scale measures and subsequent ASBI scores.

Interactive Style, Temperament and Social Competence

This section examined the third aim, exploring how child temperament was associated with mother-child interactive behavior during an eating episode and how temperament and mother-child interactions jointly were associated with social competence. First, the distribution of child temperament type and interactive style was explored, followed by an examination of the correlations between temperament difficulty and social competence. Associations between the child's temperament and the measures of mother-child interactive styles were assessed by using chi square analysis. Analyses were carried out at each age as well as by using earlier predictors with later social competence (e.g., 12 month predictors with 24 and 36 month social competence). Analysis of covariance (ANCOVA) was also conducted using social competence scores as the dependent variable and classification as the grouping variable, with temperament difficulty as the covariate.

Distribution of Temperament Categories

Prior to conducting the analyses, the distribution of children's temperament types was examined at each observation period. Tables 88 - 90 presents child temperament categories in relation to the classifications of maternal interactive style; Tables 91 - 93 presents child temperament types in relation to the classifications of child interactive style.

Table 88
The Distribution of Child Temperament Categories across Maternal Classifications at 12 Months

Temperament Category	12 months				
	facilitative engaged	controlling engaged	superficial	controlling disengaged	total
easy	9	9	10	8	36 (29%)
intermediate/ slow to warm up	13	17	28	22	80 (60%)
difficult	2	2	5	1	10 (8%)

Table 89
The Distribution of Child Temperament Categories across Maternal Classifications at 24 Months

Temperament Category	24 months				
	facilitative engaged	controlling engaged	superficial	controlling disengaged	total
easy	5	10	4	3	22 (17%)
intermediate/ slow to warm up	10	17	23	16	66 (52%)
difficult	9	11	12	6	38 (30%)

Table 90
The Distribution of Child Temperament Categories across Maternal Classifications at 36 Months

Temperament Category	36 months				
	facilitative engaged	controlling engaged	superficial	controlling disengaged	total
easy	4	6	8	5	23 (18%)
intermediate/ slow to warm up	18	14	18	21	71 (56%)
difficult	3	12	12	5	32 (25%)

Table 91
The Distribution of Child Temperament Categories across Child Classifications at 12 Months

Temperament Category	**12 months**				
	engaged assertive	intermittent engaged	compliant disengaged	active disengaged	total
easy	10	17	8	1	36 (29%)
intermediate/ slow to warm up	14	39	24	3	80 (60%)
difficult	3	6	1		10 (8%)

Table 92
The Distribution of Child Temperament Categories across Child Classifications at 24 Months

Temperament Category	**24 months**				
	engaged assertive	intermittent engaged	compliant disengaged	active disengaged	total
easy	6	8	6	2	22 (17%)
intermediate/ slow to warm up	11	27	15	13	66 (52%)
difficult	10	17	5	6	38 (30%)

Table 93
The Distribution of Child Temperament Categories across Child Classifications at 36 Months

Temperament Category	**36 months**				
	engaged assertive	intermittent engaged	compliant disengaged	active disengaged	total
easy	3	13	6	1	23 (18%)
intermediate/ slow to warm up	17	31	16	7	71 (56%)
difficult	4	16	10	2	32 (25%)

Associations between Temperament and Interactive Behavior

Chi square analysis was used to examine the associations between the child's temperament category and the concurrent maternal, child, and dyadic classifications, respectively. No significant associations were found at any observation period, as children with difficult temperaments were distributed among the patterns of child interactive behaviors and had mothers assigned to all patterns of maternal interactive behavior. The analysis was carried out to assess the temperament categories in relation to the dichotomous classifications of maternal engagement, maternal control and child engagement. Again, no significant associations were found at any observation period. Finally, the analysis was carried out using the temperament categories and the concurrent ratings of dyadic fit. No significant associations were found at any observation period.

Associations between Temperament and Social Competence

The relationship between temperament difficulty and the dependent social competence variable was assessed as a Pearson's correlation coefficient. The temperament difficulty score was significantly correlated with the concurrent ASBI total score at each observation period, the strength of which increased in relation to the child's age ($r = -.23$, $p \leq .009$ at 12 months, $r = -.38$, $p \leq .000$ at 24 months, $r = -.51$, $p \leq .000$ at 36 months). The correlation between temperament difficulty and the expressiveness was significant only at 36 months ($r = -.32$, $p \leq .000$). However, the relationship between temperament difficulty and compliance was significant at each observation period, more than doubling in strength after the first year ($r = -.18$, $p \leq .047$ at 12 months; $r = -.31$, $p \leq .000$ at 24 months; $r = -.36$, $p \leq .000$ at 36 months). Correlations between

temperament difficulty and the concurrent disrupt subscale yielded moderate correlations as well: $r = -.28$, $p \leq .001$ at 12 months; $r = -.39$, $p \leq .000$ at 24 months; $r = -.38$, $p \leq .000$ at 36 months. Generally, temperament difficulty was related to less compliance, more disruptive behavior throughout toddlerhood and with diminished prosocial expressiveness as well.

Joint Contributions of Temperament and Interactive Style

Temperament difficulty and maternal and child interactive styles were examined as jointly contributing to child social competence using ANCOVA. Social competence scores (total and subscale, separately) were entered as the dependent variables, with Snack Scale classifications as the grouping variable and child temperament difficulty as the covariate. These analyses were carried out at each age, as well as using earlier behavior patterns with later social competence (e.g., 12 month predictors with 24 and 36 months). Prior to each analysis, the variables were examined for interactions (e.g., between the classifications and temperament difficulty). When interactions were found, the analysis shifted to explore the nature of the interaction using the temperament category variable. Otherwise, when no interactions were found, the ANCOVA was carried out as described.

Assessment of social competence using concurrent measures. ANCOVA was conducted using the total ASBI score as the dependent variable with the concurrent maternal classification as the grouping variable with the concurrent temperament difficulty score as the covariate. At 12 months, no significant difference in social competence was found in relation to maternal classifications after adjusting for

temperament difficulty. However, at 24 months, the child's overall social competence varied significantly according to maternal classifications after adjusting for temperament difficulty ($\underline{F}(3, 121) = 2.77$, $\underline{p} \leq .044$, $\underline{\eta}^2 = .06$). Children of engaged mothers were significantly more socially competent in comparison to those whose mothers were controlling disengaged. The adjusted means were in the expected pattern: children of engaged mothers scored alike and highest; children of superficial mothers scored slightly higher than those of disengaged controlling mothers (Table 94).

Differences in the ASBI subscale scores were assessed for the concurrent maternal classifications as the grouping variable and temperament difficulty score as the covariate. At 12 months, the child's disruptiveness varied significantly according to maternal classifications after adjusting for temperament difficulty ($\underline{F}(3, 121) = 3.27$, $\underline{p} \leq .02$, $\underline{\eta}^2 = .08$). Children of facilitative engaged mothers were the less disruptive and children of controlling engaged and facilitative disengaged mothers were slightly more disruptive in comparison to those whose mothers were controlling disengaged, while children of controlling disengaged mothers were the most disruptive (Table 94). However, it must be noted that only 3 children with difficult temperaments had a mother with a controlling engaged or disengaged interactive style at 12 months, which diminishes temperament as an explanation for either disruptive behavior on the child's part or more controlling behavior on the mother's part. Child expressiveness and compliance did not differ in relation to maternal classifications after adjusting for temperament difficulty at 12 months.

At 24 months, the child's expressiveness significantly differed by maternal classifications after adjusting for temperament difficulty ($F(3, 121) = 3.39$, $p \leq .02$, $\eta^2 = .08$). The adjusted means differed as expected: mothers who were facilitative engaged in snack had children who were more expressive in social situations while the children of controlling disengaged mothers were least expressive (Table 94). Child compliance and disruptiveness did not differ in relation to maternal classifications after adjusting for temperament difficulty at 24 months.

Table 94
Differences between Maternal Classifications and ASBI Scores after Adjusting for Temperament Difficulty

	Snack Scale Mother Classifications			
	facilitative engaged	controlling engaged	superficial	controlling disengaged
ABSI total: Means (S.D.)				
24 months	73.08 (5.63)	73.08 (5.63)	70.77 (5.04)	70.40 (6.69)
Disrupt: Means (S.D.)				
12 months	9.04 (1.20)	9.43 (1.53)	9.70 (1.52)	10.48 (2.11)
Express: Means (S.D.)				
24 months	35.29 (2.71)	34.53 (3.51)	33.33 (3.22)	32.60 (4.47)

ANCOVA was also conducted using the total ASBI score as the dependent variable; temperament difficulty scores served as the covariate and the concurrent child classifications served as the grouping variable. After adjustment by the covariate, overall social competence did not differ according to child classification at any observation period.

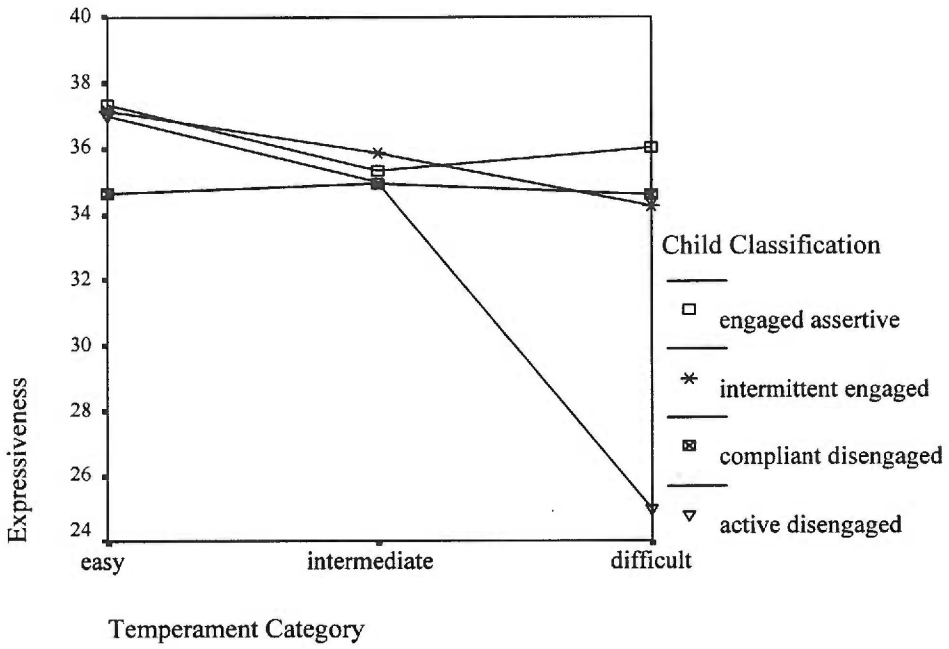
The analysis was then carried out using the ASBI subscale scores as the dependent variables, the concurrent child classifications served as the grouping variable and temperament difficulty score was the covariate. At 12 months, no differences were found in child expressiveness, compliance or disruptiveness in relation to child classifications after adjusting for temperament difficulty. At 24 months, the child's expressiveness significantly differed by child classifications after adjusting for temperament difficulty ($F(3, 121) = 3.75$, $p \leq .01$, $\eta^2 = .09$). The means differed as expected: children who were engaged with their mothers during snack were more expressive in other social situations while children who were disengaged with their mothers during snack were least expressive. The means differed according to the engagement dimension, with slight variations between groups: engaged assertive > intermittent engaged > compliant disengaged > active disengaged (Table 95). Child compliance and disruptiveness did not differ in relation to child classifications after adjusting for temperament difficulty at 24 months.

Table 95
Differences between Child Classifications and ASBI Express Scores after Adjusting for Temperament Difficulty

	Snack Scale Child Classifications			
	engaged assertive	intermittent engaged	compliant disengaged	active disengaged
Express: Means (S.D.)				
24 months	35.19 (2.73)	34.38 (3.41)	32.69 (4.32)	32.67 (3.43)

An interaction between child classification and temperament difficulty was found at 36 months ($\underline{F}(3, 118) = 3.97$, $\underline{p} \leq .01$, $\underline{\eta}^2 = .09$). The main effects were significant ($\underline{F}(2,114) = 10.16$, $\underline{p} \leq .000$, $\underline{\eta}^2 = .15$), indicating that expressiveness differed according to child interactive behavior and temperament. Group differences were explored by conducting ANCOVA with temperament category and child classification as independent variables. As expected, children with difficult temperaments and an active disengaged interactive style ($\underline{n} = 2$) were much less expressive than other children with difficult temperaments. Children with engaged assertive styles and difficult temperaments ($\underline{n} = 4$) were more expressive than similar children with intermediate temperaments ($\underline{n} = 17$). The other group of note were children with a compliant disengaged interaction style and an easy temperaments ($\underline{n} = 6$), who were somewhat less expressive in comparison with other children having easy and intermediate temperaments (Figure 3). No differences were found in child compliance or disruptiveness in relation to child classifications after adjusting for temperament difficulty at 36 months.

Figure 3
Child Expressiveness in Relation to Child Classification and Temperament Category at 36 Months



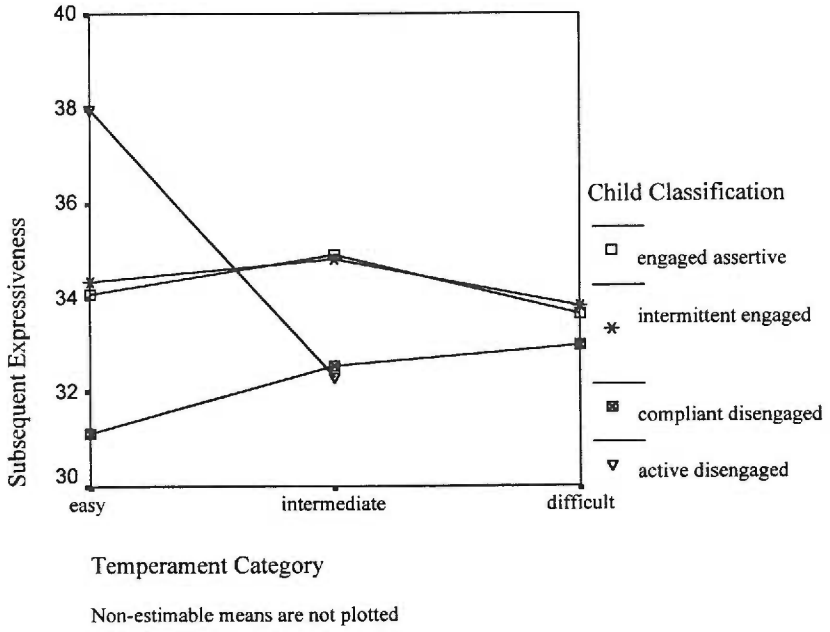
Assessment of Social Competence using Subsequent Measures

Analysis of covariance was used to assess the relationship between the interactive behavior classifications and the subsequent measures of social competence, adjusting for the child's temperament difficulty. A series of analyses were conducted using the ASBI total and subscale scores (express, comply, disrupt, and prosocial) as the dependent variable, with the previous maternal and child classifications, dyadic style and dyadic fit as the grouping variables, and the child's temperament difficulty (concurrent to behavior) as the covariate. In this way, interactive behavior and child temperament difficulty were jointly assessed as an influence on future social competence.

Maternal classifications, after adjustment for concurrent temperament difficulty, did not significantly differ with respect to subsequent social competence (ASBI total or subscale scores). Child classification, after adjustment for concurrent temperament difficulty, also did not significantly differ with respect to subsequent overall social competence (ASBI total scores). No differences were found between the subsequent ASBI subscale scores and child classification at 12 months. Likewise, subsequent child compliance and disruptiveness did not differ in relation to child classifications and temperament difficulty at 24 or 36 months.

An interaction was found when child classification at 12 months was used to predict expressiveness at 24 months, adjusting for 12-month temperament difficulty ($\underline{F}(3, 118) = 4.37$, $\underline{p} \leq .006$, $\underline{\eta}^2 = .10$). The main effects were significant ($\underline{F}(2,114) = 5.41$, $\underline{p} \leq .022$, $\underline{\eta}^2 = .04$), indicating that children's subsequent expressiveness differed according to interactive style and temperament category. Group differences were explored by conducting ANCOVA with child classification and temperament category as independent variables (Figure 4). The child with an active disengaged interactive style and an easy temperament was the most expressive ($\underline{n} = 1$), while children with an active disengaged style and an intermediate temperament were markedly less expressive. Compliant disengaged children with easy temperaments ($\underline{n} = 8$) were the least expressive, although similar to similar children with intermediate ($\underline{n} = 8$) or difficult temperaments ($\underline{n} = 1$). Engaged children with intermediate temperaments were slightly more expressive than similar children with easy or difficult temperaments. The small cell sizes for children with difficult temperaments render the results unreliable.

Figure 4
Child Expressiveness at 24 months in Relation to Child Classification and Temperament Category at 12 Months



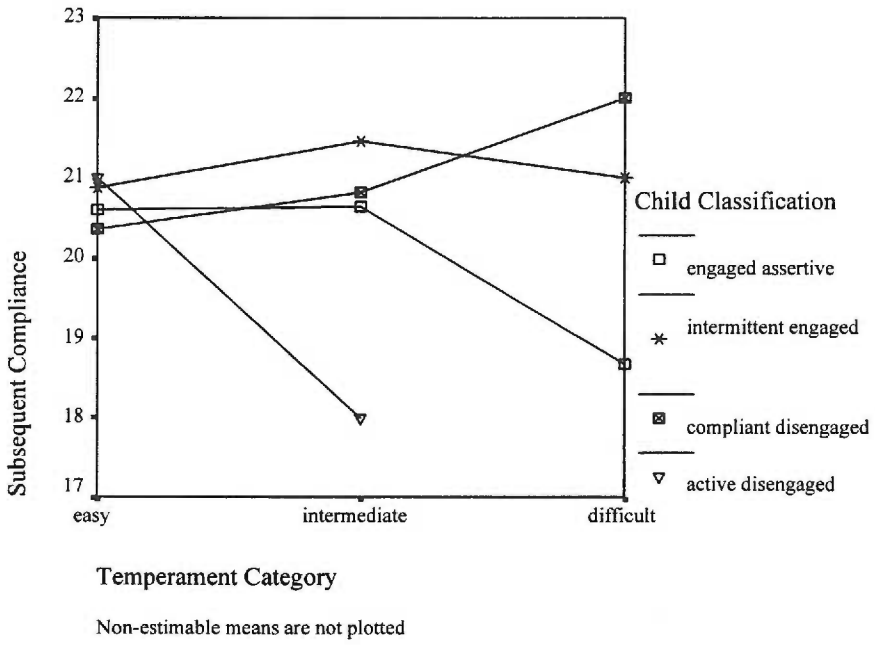
Child expressiveness at 36 months differed according to child classification and temperament difficulty at 24 months ($F(3, 121) = 3.03$, $p \leq .032$, $\eta^2 = .07$). Children who were engaged with their mother during snack at 24 months were more expressive in social situation at 36 months than were those classified as compliant disengaged, with active disengaged children the least expressive. As shown in Table 96, the means differed as expected.

Table 96
Child Classifications and Subsequent ASBI Express Scores after Adjusting for Temperament Difficulty

	Child Classification at 24 months			
	engaged assertive	**intermittent engaged**	**compliant disengaged**	**active disengaged**
Express: Means (S.D.)				
36 months	35.96 (2.52)	35.67 (2.56)	35.08 (3.01)	33.67 (3.83)

An interaction was found when child classification at 12 months was used to predict compliance at 24 months, adjusting for 12-month temperament difficulty ($F(3, 118) = 5.07$, $p \leq .002$, $\eta^2 = .10$). The main effects were significant ($F(2,114) = 10.16$, $p \leq .000$, $\eta^2 = .15$), indicating that children's subsequent compliance differed according to interactive style and temperament category. Group differences were explored by conducting ANCOVA with child classification and temperament category as independent variables. Children with engaged assertive styles and difficult temperaments ($n = 3$) and active disengaged children with intermediate difficult temperaments ($n = 3$) were the least compliant. The child with a difficult temperament and compliant disengaged style ($n = 1$) was the most compliant of all children; those with intermediate or difficult temperaments and an intermittent engaged style (n = 36 and 6, respectively) were also notably compliant (Figure 5). Again, the small cell sizes render the results unreliable.

Figure 5
Child Compliance at 24 months in Relation to Child Classification and Temperament Category at 12 Months



Summary of the Analyses related to Temperament

The final set of statistical analyses examined the role of temperament in relation to interactive style and social competence. First, the distributions of child temperament types were examined in relation to the interactive styles. Next, chi square analyses revealed no associations between temperament types and interactive styles. Temperament difficulty was shown to be inversely correlated with social competence at every age. Finally, ANCOVA was used to demonstrate that the child's social competence in other settings differed according to interactive styles after controlling for temperament difficulty.

CHAPTER V

DISCUSSION

The purpose of this study was to explore the development of social competence as an outcome of mother-toddler interactions. Since mealtimes provide consistent and predictable opportunities for mother-toddler social experiences during which interactive patterns may be established and carried forward, an observational coding system was developed to assess the quality of maternal-toddler interactions during an eating context. Thus, the reliability and validity of the new scale were examined prior to exploring the relationship between maternal and child interactive styles and the child's social behaviors.

The reliability of the Snack Scale was established through interrater reliability, the internal validity of the coding scheme, evidenced for congruence between the three components of the scale, and finally through the stability of the scale measures over time. Convergent validity was established using observational tools that measured similar concepts. Construct validity was demonstrated by the outcome of interest, social competence, which differed in relation to classifications and ratings derived with the Snack Scale. Child temperament and maternal-child interactions were found to jointly contribute to the child's manifestations of social competence.

This chapter discusses the study aims in relation to the overall purpose of the study. Understandings about the development of social competence are considered in relation to maternal and child interactive styles, dyadic mutuality and the stability of

interactive patterns over time. The role of temperament is examined in relation to the interactive patterns and subsequent social behaviors, framing temperament as an inherent risk factor for both the child and the dyad. Implications for nursing practice are presented, as well as the limitations to the study and future research directions.

The Salient Behaviors within Interactive Styles

Maternal Interactive Styles

Maternal responsiveness and control were consistently important in distinguishing maternal interactive style throughout toddlerhood. In the discriminant analysis, the dimensions loaded on two distinct factors at all observation periods and retained similar relationships at each observation period. The first factor in the discriminant analysis, which reflect the strongest relationship between variables, described the balance between maternal control and child autonomy and, hence, social engagement. Controlling maternal behavior was inversely related to the child's mother-directed initiations at 12 months and positively related to the child's self-focused initiations at 24 and 36 months. Longitudinally, these relationships suggested that maternal control serves to influence the toddler's development of self-occupied behaviors and diminished social initiation with her.

The second factor identified relationships between maternal behaviors that facilitate child autonomy, maternal verbal responsiveness to child behaviors, and subsequent child responsiveness. Maternal initiations and responsiveness at 12 months evolved into a dyadic responsiveness, evidenced at 36 months by both maternal and child follow -- jointly defining the second dimension. In other words, maternal responsiveness

evolved into mutual responsiveness over the second year. There was continuity in the mother's cooperative assistance and well-timed, contextually-appropriate maternal responses to child-initiated actions. Furthermore, this factor suggested that children model, if not internalize, maternal responsiveness in the presence of gentle maternal prompting. Mothers who manifested frequent verbal responsiveness to their child at 12 months had children at 24 months who were verbally responsive to maternal initiations. Combined, the two factors differentiated maternal interactive styles according to the definitions within the Snack Coding Manual.

Similar results were found when examining the proportions of maternal responsiveness (in relation to child autonomy) and control (in relation to all maternal behaviors). Nominal level differences in maternal classifications were found, although the similarities between classification groups emerged at specific observation periods. It is possible that social expectations regarding maternal behavior may account for some of the time-specific similarities between groups, whereas interactive styles are illustrated in group differences. For example, the expectation for mothers to actively teach eating-related behaviors may account for the two groups of engaged mothers manifesting similar proportions of directive behaviors at 12 months. Likewise, knowledge of the benefits of verbal stimulation may explain why the engaged controlling and superficial mothers manifested similar proportions of responsiveness at 12 and 24 months. The interactive styles, however, were distinguished by the differences in proportional manifestations of responsiveness and control.

The facilitative engaged group of mothers were characterized by little directive behavior in conjunction with a moderate amount of facilitation and verbal responsiveness. Facilitative engaged mothers encouraged (facilitated) child autonomy by limiting their directiveness and providing space within the interaction for the child to act independently. By responding to their child's self assertions, these mothers seem to convey a sense of value and respect for their children. Maternal verbal responsiveness, characteristic of the facilitative engaged mother, potentially helps the child acquire language skills, connect words with actions and interpret the meaning underlying social behaviors. The responsiveness of facilitative engaged mothers seems to reflect their adaptiveness to their children's developmental competencies and increasing independence (Kinderman & Skinner, 1988). It is notable, and likely important to the child's social development, that these children manifested consistent behavioral patterns throughout toddlerhood. Such stability is revealed in the fairly stable discriminant analysis centroid values at each observation period.

The results of the discriminant analysis suggested the controlling engaged mothers were domineering interaction partners, continuously acting and reacting. Whereas this group displayed decreasing maternal directiveness throughout toddlerhood, they also manifested the most assistance and verbal responsiveness. Moreover, too much maternal responsiveness may not facilitate the child's developmentally salient tasks and may, in fact, be interfering. At 36 months, controlling engaged mothers had the most assistance (facilitative directs) and nonverbal responsiveness to child actions. Consistent with the definition of this behavior pattern, controlling engaged mothers may simply

provide too much help. This line of thinking serves to explain why, for dyads with controlling engaged mothers, maternal responsiveness did not evolve into mutual responsiveness as it did with facilitative engaged mothers. Children of controlling engaged mothers had limited responsiveness to their mother, largely due perhaps, to the sheer volume of maternal actions.

The superficial group of mothers was characterized by little directiveness that extended to limited mother-initiated assistance (facilitative directives). Superficial mothers did not control or interfere with their child's autonomy but they also did not initiate social interactions. Their responsiveness was limited until later toddlerhood and, even then, their responses were nonverbal at a time when the child had language and comprehension skills, and could engage in conversation. Superficial mothers modeled passivity in social interaction during snack time. Their children were not likely to experience mother as an active social partner who initiated or participated in sustaining interactions. Although superficial mothers were similar to facilitative engaged mothers in terms of their controllingness, they were distinguished from engaged mothers by the scarcity of facilitative assistance and verbal responsiveness.

The disengaged controlling group of mothers was characterized by controlling behavior and little facilitative assistance or verbal responsiveness. The limited amount of mutual responsiveness manifested by their dyads at 24 months was likely owed to the child's newly developed motor and language skills. Alternatively, this low level of responsiveness may reflect the child's responses to maternal control and/or maternal responses to the child's self-occupied behaviors. Compounding the disengaged

controlling mother's limited verbal responsiveness was a lack of nonverbal responsiveness at 36 months. Similar to the superficial mothers in terms of diminished responsiveness, one would expect that this group did not facilitate the child's developmentally salient tasks. Given their mothers' level of controllingness and unresponsiveness, it seems a reasonable concern that the children of disengaged controlling mothers may experience a sense of isolation, disregard, or disapproval in interactions with their mother at meal or snack times.

The results of the discriminant analysis revealed behavioral patterns consistent with the classifications as defined by the Snack Coding Manual. The predictors clearly differentiated maternal interactions styles in the context of eating, as was the intent of the Snack Scale. The control dimension of maternal behavior was manifested around eating-related skills whereas contingent responsiveness, the other dimension, seemed to foster the social skills required to sustain cooperative engagement. The interrelatedness of the factors supports the view put forth by Mize and Pettit (1997) and Kinderman and Skinner (1988) that maternal interaction style is more important than the content of the interaction. This perspective is illustrated in the analysis of eating situations. Mothers may foster autonomous eating-related skills by cooperatively facilitating their child's efforts and simultaneously achieve a shared goal of connectedness or engagement, with both partners potentially deriving satisfaction and pleasure from the interaction. Alternatively, mothers may control eating using directiveness, power, and criticism, thereby limiting interactive connectedness or enjoyment. While both approaches result in the child's acquisition of eating skills, the longer-term social outcomes are different.

Child Interactive Styles

The results of the analysis of child classifications revealed that child behavior indeed varied according to development whereas a particular pattern of maternal behaviors was consistently important at each age. The important child behavior at both 12 and 24 months was mother-directed initiation. This other-directedness, as early as 12 months, is consistent with the notion that young children are drawn or inclined toward social engagement. Additionally, it was evident that the progressive distinction, variation and meaning of child behaviors occurred in conjunction with the development of motor, language and cognitive competencies. At 12 months, mother-directed initiations alone distinguished the classifications, yet at 24 months additional child behaviors were important to distinguishing child classification differences. Child responsiveness (follow) emerged at this age and was inversely related to self-occupied behavior, suggesting that in the absence of an engaged interaction partner, the child becomes more self-absorbed. In fact, at 36 months, child self-occupied and mother-directed autonomous behavior were found to clearly reflect separate dimensions.

The consistently important maternal behaviors, controlling directives and verbal responsiveness, were inversely related at every age. Contrary to expectations, maternal facilitativeness and nonverbal responsiveness were not important predictors of child interactive style, pointing to these behaviors as commonly experienced by all children. However, the same behaviors that were important to maternal classification were also important to child classification. Since the balance between maternal controllingness and verbal responsiveness was important in distinguishing the interactive styles of both

mother and child, these maternal behaviors must be considered as foundational to the child's social patterns throughout toddlerhood.

The classifications were also distinguished by the proportion of the child's behavior that was other-directed autonomy and responsive to the mother's directives. Engaged children (assertive and intermittent) manifested similar proportions of autonomous behavior at 36 months, while disengaged children (compliant and active) displayed different proportions at 36 months -- of course, the disengaged children were less oriented to their mothers at this age. Intermittently engaged and compliant disengaged children manifested similar proportions of responsiveness throughout toddlerhood, although one would speculate that intermittent engaged children do so out of an eagerness to engage with mother where as compliant disengaged children do so out of compliance. Active disengaged children did not respond much like this cohort until 36 months, as they initially were the least responsive then most responsive in the second year. The similarities between classifications may be due to the process of development, while the differences between the groups reflect distinct interactive experiences.

The engaged assertive children were characterized at every age by mother-directed initiations and responsiveness to her. This pattern occurred in the context of mothers who were not controlling and were highly responsive to their children's efforts. The engaged child's responsiveness at 24 months reflects their newly acquired capacity to sustain interaction by responding to their mothers. Since the child's responsiveness occurred in conjunction with ongoing maternal responsiveness, it may be that the child mirrors and internalizes mother's responsiveness. The discriminant analysis at 36 months indicated

that the engaged assertive child had few mother-directed initiations -- a finding that, on the surface, was contrary to expectations. However, the lack of self-directed behaviors in conjunction with maternal responsiveness suggests that the rare child-initiated interaction with mother was sustained by joint responsiveness throughout the eating episode. Potentially, if engaged assertive children understand their mother's verbal responsiveness and lack of controllingness as acceptance and approval of their own initiations and engagement, their social confidence should be enhanced.

In contrast, the intermittent engaged children were characterized by more moderate levels of mother-directed initiations and responsiveness. This group, compared with engaged assertive children, were less mutually engaged with their mothers as evidenced by the extent of both mother-initiated and self-occupied behavior. In conjunction with moderate maternal controllingness and verbal responsiveness, the interactions could not be sustained. Hence, the "intermittent" engagement characterizes this classification.

Children in the compliant disengaged group were characterized by little mother-directed initiation and responsiveness (follow) throughout toddlerhood. Compared to the previous groups, these children displayed more self-directed behavior in the context of more maternal controllingness and little verbal responsiveness (follow). This pattern implies disengagement, with maternal control and child self-occupation eliminating much basis for engagement. Certainly the diminished maternal responsiveness would not provide adequate opportunities for the child to practice or internalize responsive behaviors. The ongoing self-directed behavior may be the child's attempt to compensate

for the lack of maternal responsiveness, perhaps an interactive boredom. It is not surprising, then, that compliant disengaged children appear detached from interaction with their mothers in contrast to the engaged classifications.

Children classified as active disengaged were also characterized by a little mother-directed initiation and little responsiveness throughout toddlerhood. They were also highly self-occupied, which increased throughout toddlerhood. These self-occupied child behaviors occurred in conjunction with maternal behavior that was highly controlling and rarely verbally responsive. At 36 months, the child's high rate of mother-directed initiations as well as a high rate of self-directed behavior illustrated the child's opposition to maternal control, a dynamic included in the definition of this classification. This pattern differentiated active disengaged children from compliant disengaged children, who had less self-occupied behavior. Like the compliant disengaged children, active disengaged children appeared to be detached from their mothers compared to those who were engaged.

The discriminant analysis revealed that each child classification reflected patterns of behavioral frequencies consistent with the definitions for the Snack Coding Manual. The predictor variables clearly differentiated child interactive styles around food, as was the intent of the Snack Scale. For children, interactive styles were differentiated by the manner and timing in which developmentally salient behaviors were manifested in the dyadic interaction.

The Dyadic Interactions Over Time

Maternal Behaviors

The maternal style of interacting with her young child in an eating situation reflected a pattern of behavior. Moderately stability was demonstrated over 1- and 2-year intervals, consistently reducing a third of the error in predicting future maternal interactive styles. The diminishing strength of the control dimension over 1- and 2-year intervals suggests that, generally, maternal control was a behavioral response to age-specific child behaviors and was relinquished over time in relation to the child's developmental competence. The stronger stability of the engagement dimension over the 2-year interval likely indicates that engagement is an intrinsic characteristic of maternal interactive style. Furthermore, since most mothers (90%) were assigned the same classification at two of three observation periods, the maternal style of interacting with her young child in an eating situation is established early in the child's life. The majority of the mothers manifested one fluctuation in interactive style but no pattern was found regarding the observation period in which it occurred.

Child Behaviors

The child's style of interacting with the mother during snack also reflected patterned behavior. Like their mothers, nearly all of the children (89%) were assigned the same classification at two of three observation periods. Two-thirds of the children manifested one fluctuation in interactive style, although no pattern was found regarding the observation period in which it occurred. However, unlike the stability of maternal behavior over time, child classifications were weakly associated over time. This finding is

congruent with the process of development and reflects the changing nature of child interactional competencies. The sole interval in which stability was found, 24- to 36-months, highlights the importance of the maturation process to the child interactive style. Both sets of findings provide insight with regards to early intervention with toddler interactive behavior over time. The instability of the child classifications early in toddlerhood (12 to 24 months) suggests the potential for malleability, as described by the perspectives of developmental psychopathology (Cicchitti, 1989). However, viewing maternal interactive behavior as a contextual influence on early social development and self-righting tendencies as weakened after the second year (McCall, 1981), stable but problematic maternal interactive styles may serve to reinforce an enduring pattern of social interaction with mother and thereby influence social behaviors with others. Temperament may well be a component of the child's self-righting tendencies, and be reflected broadly in the child's proclivity to be more or less engaged. Essentially, some children are more social than others and this facet of temperament may have been reflected in the consistent moderate stability of the dichotomous engagement/ disengagement classification.

Maternal-Child Interactive Styles

When maternal and child classifications were linked, the stability of the dyadic interaction style was consistently significant. This stability was somewhat surprising, and implies that dyadic interactive styles are indeed patterns of interaction that reflect a balance in the dimensions of maternal control and mutual engagement. The process by which the dyadic interactive styles were assigned highlights the importance of maternal

behavior to these overall dyadic interactions. While the seven styles derived from the actual matches between maternal and child classifications were not stable, the dyadic styles assigned on the basis of maternal behaviors were stable across all intervals. Thus, the dyadic interaction pattern appear to be largely directed by the maternal behavior. It must be noted that this conclusion is tentative since the corollary directional force was not examined. The actual matches of maternal and child classifications were not collapsed on the basis of child behavior. However, since child classifications did not exhibit stability over time -- and maternal classifications were consistently stable. It is unlikely that the dyadic pattern was guided by the child's behavior.

Patterns of Dyadic Adaptivity and Mutuality

Contrary to the dyadic styles, the ratings of dyadic fit were not stable throughout toddlerhood. Moderate stability was found only in the early toddler period, from 12- to 24-months. Interestingly, child interactive patterns better predicted dyadic fit at 12 months -- a time of strong maternal influence and fewer expressions of child autonomy while maternal style better predicted the rating at 24 months -- a period in which expressions of child autonomy are typically in opposition to maternal plans. It may be that, in the first year the child adapted to the mother's lead and, in the second year, the mother accommodated her child's assertions. It is also probable that maternal influence on the dyad's adaptability diminished as the child gained interactive skills and competencies.

The Dyadic Interaction: Age Specific Understandings

Maternal and Child Interactive Styles

The child's maturation process likely influenced the varying strengths of association between the concurrent maternal and child styles. The decreased association at 24 months probably reflects the effect of salient developmental changes on mother-child interaction patterns, in which maternal behaviors must adapt to child expressions of autonomy. The strongest relationship, at 36 months, may illustrate the cumulated history of mother and child interactions patterns. It is interesting that the associations between the dichotomous classifications of maternal control and child engagement were especially strong at 36 months while the associations between maternal engagement and concurrent child engagement decreased gradually over time. Although maternal control and engagement were both important predictors of child autonomy throughout toddlerhood, control became important when the child's developmental skills and competencies were more developed while maternal engagement diminished in relation to the child's maturation. Such shifts are not unexpected theoretically. The earlier salience of maternal engagement reflects the importance of mother-infant attachment patterns (Ainsworth, et. al., 1978) and the later prominence of maternal control highlights its influence on autonomy as compliance and expressiveness (Crockenberg & Littman, 1990).

Ratings of Mutuality

The mutuality rating and the classifications of interactive behavior measured overlapping aspects of social interaction, as both maternal and child interactive styles at every observation period reduced two thirds (60%) of the error in predicting the mutuality

rating. However, maternal interactive behavior better predicted the mutuality rating in the second and third years, indicating that the quality of dyadic adaptivity and responsiveness was largely influenced by the mother's interaction style. For children, classification better predicted the mutuality rating at 24 months and mutuality better predicted child interactive behavior at 36 months -- suggesting the salience of child expressions of autonomy at 2 years and the maturation of self- and mutual-regulation at 3 years. These findings again imply that mothers direct the tone of the dyadic interaction, as maternal interactive styles respond differently to the salient developmental tasks which influence the interactive behaviors of children.

Affect Ratings

The influence of maternal and child affect on their respective interactive partners changed over time. Mothers appeared equally sensitive to their children's affect at 12 and 24 months but less so at 36 months. The child's sensitivity to maternal affect was evident at 24 and 36 months, probably signaling the use of social referencing to direct self-regulation and social understandings. That child affect at 12 months better predicted maternal affect likely reflects the mother's early matching of her child's affect; the shift in the direction of influence after the first year conveys the salience that maternal affect has for toddler behavior in social situations as the mother serves as a social reference. Additionally, it may be that the child's affect in the first year is influenced by the child's mood, a dimension of temperament type.

Maternal interactive behavior consistently predicted maternal affect; the strength of the prediction doubled from 12 to 24 months and stabilized thereafter. It may be that

maternal interactive behaviors encompassed an increasing affective clarity after the first year. It is also probable that the definitions of maternal interactive styles incorporated affective meanings to distinguish behavioral styles. Likewise, child classification assignment better predicted maternal affect at every observation than visa versa. The strength of this relationship was stable across observation periods, pointing to maternal affect as a response to her child's interactive behaviors. The mutuality rating also predicted maternal affect at 12 months, similarly suggesting that maternal affect may be a response to dyadic mutuality. After the first year, these two measures seem to tap a common aspect of the mother's contribution to dyadic regulation, since the mother's affect seemed to mirror the degree of dyadic mutuality. The magnitude in which the relationship increased and stabilized at 24 months may indirectly reflect the influence of the children's motor and cognitive competencies, which required the mother to respond and react to the child's contributions to the interaction.

Similarly, child interactive behavior and child affect were related at all observation periods. Child affect predicted the assignment of the child's classification at 12 and 24 months; the dramatic lack of relationship between affect and behavior style at 36 months illustrates the extent to which emotional regulation, a marker of self regulation, matures in the third year. Additionally, social norms concerning affective displays may be internalized in the third year; this suggestion is supported in the shift among all children towards more positive ratings at 36 months. In contrast, the steady strength with which child classification predicted affective display suggests that toddler affect arose out of their interactive behavior. The influence of maternal interaction style

on child affect was apparent throughout toddlerhood, increasing slightly at 24 months in conjunction with the child's ability to interpret and participate in social interactions and direct the eating episode. The associations between the ratings of child affect and dyadic fit indicated that toddler affect was enhanced by the degree of dyadic mutuality and adaptiveness. Interestingly, both of the directional measures of this association were exaggerated at 24 months, suggesting that the child's affect and dyadic adaptiveness were mutually influential at this specific developmental period. Since the second year is characterized by expressions of autonomy, this mutual influence is intuitively logical.

Overall, the relationship between classification and affect was stronger for mothers than for children. It is likely that mothers conveyed clearer affective meanings in behavior. Toddlers conveyed a smaller range of affective behaviors; in fact, the vagueness of affective displays at 12 months prompted a refinement in the coding definitions. Furthermore, it is possible that the child's affect was influenced by observational demands or reactivity, such as the strangeness of the research setting and deviations from daily routine. It also may be that the definitions of child classifications did not incorporate affective displays, focusing instead on overt behaviors. It is notable that the majority of mothers and children were rated as displaying a neutral affect at all observation periods. One must wonder if the predominance of a neutral emotional tone has any ongoing significance for subsequent social interactions with others, since eating contexts provide an ongoing context for mother-child social interaction. Children trend towards a more positive affect over time, possibly related to their socialization around eating and their

increasing autonomy in eating situations. Maternal affect shifted towards a more negative affect, perhaps for the same reasons.

Individual Interactive Patterns and Dyadic Mutuality

The strongest relationship, for both mother and child classifications at every observation period, was between individual classification and dyadic mutuality. It may be that this strength was a result of the 3-point rating scale for mutuality. It is likely that the "middle" classifications (controlling engaged and superficial for mothers; intermittent engaged and compliant disengaged for children) were combined into ratings of some mutuality. Thus, the strong associations may be due to the cell sizes. Regardless, the ratings of mutuality captured the degree to which a specific behavior pattern was capable of adapting to the other's behavior. Engaged interactions reflect the balance of joint initiation and responsiveness which enables the sharing of interactive power, described by Sanders (1976) as "the meshing together of interactional tendencies." Maternal behaviors evolve in relation to the child's developmental capabilities, and support and promote the child's self assertions and contingent responsiveness. It is not surprising that the relationship between affect and mutuality improves throughout toddlerhood for both mothers and children. Both ratings tap the emotional quality of mutuality. Affect is displayed not only within individual actions but shared within interactions as expectations are established and dyadic patterns mature.

Measurement Validity and Related Contextual Issue

Maternal Interactive Patterns across Contexts

Consistent associations were found between the Snack Scale measures of maternal

interactive behavior and those derived from play, while those between the Snack Scale maternal measures and those derived from teaching were less so. However, it remains that some association was found at all observation periods and across contexts, implying that maternal interactive style is an intrinsic characteristic. The snack and play measures of maternal interactive styles were often linked as expected (e.g., sensitive non-directiveness in play and facilitative engagement during snack, or intrusiveness in play and controlling engagement or disengagement during snack). However, half of the time the associations were surprising (e.g., sensitive- or controlling directiveness in play with superficial disengagement during snack). Perhaps maternal behavior was influenced by the examiner's directions preceding each interactive episode, so that the measures of her interactive style may be somewhat context specific. The examiner clearly conveyed that mother-child interaction was expected when introducing the mother-child play episode; the resulting maternal behavior may have reflected the understanding that "the good parent" uses play as an opportunity to stimulate or educate her child. It is also possible that some mothers rarely played with their children, but this would not have been observed given the directions to "have fun." In contrast, the snack episode was introduced as "a break" with no implied expectations for maternal-child interaction.

Likewise, the snack and the teaching measures identified similar distinctions on the basis of the overall maternal interactive quality and contingent responsiveness. Contrary to expectations, although limited to the first year, mothers classified as superficial with the Snack Scale received the lowest scores for interactive quality and contingency in the teaching situation rather than those with a controlling disengaged style.

However, this finding is also theoretically logical; diverse developmental perspectives acknowledge the primacy of mother-child interaction for cognitive and psychological development throughout the first year of life. Mothers with a superficial style provided few interactive opportunities, whereas the initiations and responses of mothers with controlling disengaged styles initiated or responded a great deal, albeit with negative connotations. Nevertheless, in light of the diminished stability of the NATS measure, the results concerning convergent validity must be cautiously interpreted.

Child Interactive Patterns across Contexts

Rather than reflecting an invalid measure, the lack of convergent validity for child classification may reflect the process of development and the salience of context for the young child's interactive behavior. The snack and play observational coding scales tap the same dimensions (child engagement and autonomy) with an identical interactive partner and similar measurement techniques -- but in different contexts. The sole association between the snack and play measures at 36 months suggests that perhaps behavior patterns became internalized between 24 and 36 months. However, since the interactive style had not yet matured to represent an intrinsic child characteristic, relationships were not found at 36 months with the broader NCATS measures of child interactive quality and responsiveness.

Dyadic Measures across Contexts

The validity of the Snack Scale measure of dyadic interactive style was established with the CABS (play) and NCATS (teaching). Although the assignments of dyadic styles were made in distinct contexts, the play and snack scales distinguished

similar interactive characteristics of the mother-child dyads. Likewise, the NCATS distinguished dyadic styles on the basis of dyadic interactive quality and overall contingent responsiveness in a teaching context. The dyadic style characterized by maternal disengagement and control was again associated with a higher dyadic interactive quality than was the dyadic style characterized by maternal disengagement without control, although the difference was diminished by 36 months. These two dyadic styles differed according to dyadic quality (at 12 months) and contingency (at 36 months) -- both of which represent a style of interactiveness rather than a lack of interaction. This finding, along with the validity of the findings for maternal classifications, highlights the importance of an active maternal presence for the development of early interactive behaviors.

Likewise, the snack measure of the dyad's mutual adaptivity and responsiveness was also valid when examined using measures of dyadic adaptiveness and contingency derived in play and teaching contexts, with one exception. In the second year, dyadic adaptiveness in play and contingent responsiveness in a teaching context were not associated with dyadic fit ratings in snack, suggesting a developmentally specific period of contextual influence. It is notable that the relationships between mutuality in snack and interactive quality during teaching become more robust over time, likely because the dyadic interactive styles strengthened over time. The decreasing relationships between dyadic mutuality and contingency scores may reflect the diminishing salience of maternal responsiveness and the older toddler's deliberate decisions regarding responsive behaviors (Hay, 1994).

Measures of Affect Across Contexts

The Snack Scale ratings of maternal and child affect were associated with the respective affect ratings derived using the play scale at 12 and 36 months, and rated as more positive in snack than in play. It is possible that the two contexts were understood differently by mothers, with performance expectations conveyed in the joint play episode and with snack perceived as a true "break time." The positive affect of children during snack may have been related to hunger, their readiness for a new activity, or their comfort with a familiar interactive context. Thus, the affect rating assigned in snack may provide a "truer" measure of maternal and child affect than the rating derived during play.

The examinations of concurrent validity highlighted the unsettled nature of maternal-child interactions at 24 months. The Snack Scale dyadic interactive styles, dyadic mutuality ratings, and affect ratings had validity at the earlier and later observational periods but not at 24 months. Perhaps the dyadic interaction varied according to interactive context (snack, play and teaching) in the second year, when the child's salient developmental task concerned emotional and behavioral regulation (Koop, 1982). At 24 months, the child was capable of expressing increasing autonomy but not yet able to regulate it, nor was the mother able to effectively direct the child's behavior. The lack of evidence for validity at 24 months was probably not related to the Snack Scale's sensitivity but instead reflected contextual influences on the process of developmentally motivated changes.

Interactive Style, Temperament, and Social Competence

The Snack Scale measures of maternal and child interactive behavior were designed to measure individual behavior patterns in relation to the partner's behavior. When the interactive styles were examined in relation to social competence, the findings supported the perspective that the development of social competence has its foundations in the early maternal-child social interactions. Such findings supported the hypothesis that for toddlers, maternal-child behavior styles provide a template for social interactions with others.

Relationships between Interactive Style and Social Competence

Maternal Styles. Maternal behavior patterns did not influence the child's concurrent overall social competence nor did it predict subsequent social competence. However for child disruptiveness at 12 months, the effect exerted by the maternal interactive style varied in the expected manner: mothers with a controlling disengaged style had children who were most disruptive, those of engaged controlling mothers were moderately so and superficial mothers had children who were slightly disruptive. Maternal behavior patterns impeded prosocial expressiveness at 24 months, as expressiveness was negatively affected by controlling disengaged, controlling engaged and superficial interactive styles. Prosocial expressiveness was optimized by mother with a facilitative engaged style. This suggests that maternal control and disengagement were equally salient with respect to child expressiveness at 24 months. Thus, controllingness predicted disruptive behavioral autonomy early in toddlerhood whereas controllingness and disengagement both predicted diminished social autonomy at 24 months.

It is striking that the influence of maternal behavior style was exerted through the simultaneous interplay of maternal behavior and the child's concurrent development tasks. At 12 months, opportunities for disruptiveness emerge as the child is now able to take an active role in interactions around food. Similarly, at 24 months, social expressiveness occurs in conjunction with the further development of language and cognitive competencies. Thus, maternal interactive styles directly influenced two of the component measures of social competence at developmentally salient periods. While it is surprising that maternal behavior styles did not influence subsequent social competence, it may be that this influence will be indirectly exerted. As Cicchitti (1987) postulated, incompetent social adaptation at one stage makes future adaptation difficult and renders a vulnerability for future problems.

Child Styles. Similar to the findings with maternal behavior patterns, child interactive styles did not predict the child's overall social competence or subsequent social competence. However, child behavior patterns exerted a strong negative influence on the concurrent measures of prosocial expressiveness at 24 and 36 months. At 24 months, children who manifested a higher level of engagement with their mothers during snack were more socially expressive. Children with an active disengaged pattern were the least expressive and those with a compliant disengaged pattern were only modestly more so. This pattern shifted so that the degree of disengagement was salient at 36 months. Children with an engaged style (engaged assertive and intermittent engaged) similarly manifested prosocial expressiveness, while children who were disengaged from their mothers during snack were least expressive. Thus, engagement with mother during snack

at 24 months predicted prosocial expressions with others and disengagement pointed towards diminished social expressiveness at 36 months.

It is notable that prosocial expressiveness stands out as the component measure of social competence that was differentiated by both mother and child interactive styles. Theoretically, infants and toddlers are drawn towards social interaction. Prosocial expressiveness takes on developmental salience, as self-concept, self-esteem and autonomy become integrated and manifested in relationships and interactions (Houck & Spegman, 1999b). Thus, differences in prosocial expressiveness are particularly relevant indications of the early social development.

Dyadic Mutuality. The ratings of mutuality at 12 months predicted not only concurrent social competence but the child's subsequent social competence at 24 months as well. The pattern of the effect sizes revealed that membership in a dyad with poor mutuality exerted a strong negative effect on the child's overall social competence and disruptive behavior at 12 months as well as prosocial expressiveness at 24 months. The mutuality established in the child's first year was therefore highly predictive of the child's social behaviors in the second year. In terms of specific dimensions of social competence, the pattern of means and effect size were consistent across scales and observation periods, although the quality of dyadic mutuality was related to different dimensions of children's social behavior in a time-specific manner.

The mutuality ratings captured the degree to which the dyadic partners responded to each other in an adaptive and emotionally connected manner. As such, the dyadic pattern provided a global assessment of the balance of joint initiation, responsiveness and

emotional connectedness. The definitions of dyadic mutuality ratings suggest that both partners in a connected dyad were mutually responsive, conveying a sense of emotional warmth. In a dyad with some mutuality, one partner compensated for the other by initiating interactions, accommodating, and responding so that the emotional tone was tenuous and unpredictable. Neither partner in a dyad rated as displaying poor mutuality conveyed emotional warmth or actively adapted and responded to the other; rather, interactive energy was lacking or was directed towards attaining one's own agenda. Although this global assessment did little to identify or describe the nature of the dyadic misfit, it was a powerful tool for identifying dyads which in which children are at risk for diminished social competence and supports findings for the importance of mutual responsiveness in mother-child interactions.

Relationships between Interactive Style, Temperament and Social Competence

This study conceptualized social competence as a style of child interactive behaviors that is influenced by temperament. Social competence, in fact, was defined as the child's responses to interpersonal interactions while temperament was understood as responses to the larger realm of environmental stimulations. Temperament difficulty was inversely correlated with social competence at every observation period, the strength of which increased in relation to the child's age. Generally throughout toddlerhood, temperament difficulty was related to less compliance, more disruptive behavior and to diminished prosocial expressiveness. The relationships between temperament and social competence were expected since temperament was considered an inherent component of the self. In this way, temperament was acknowledged as a component of both the child's

interactive style and as the child's influence on maternal behavior (Carlson & Sroufe, 1995). Since temperament reflects the child's sociability, activity, and emotionality -- which also influence the likelihood for social engagement -- temperament difficulty can be understood as vulnerability for social incompetence.

This study found that, for toddlers, a difficult temperament diminished both concurrent and subsequent manifestations of competence in social situations. The salience of developmental tasks and the influence of temperament was apparent when measures of social competence were adjusted for temperament difficulty. Thus, the hypothesis that the influence of a child's difficult temperament was mediated by the quality of mother-child interactions over time was supported, albeit a limited influence. While the majority of children with difficult temperaments in the present sample actually manifested an engaged interaction style with their mother during snack, these children were less socially adept with others. It may be that children with difficult temperaments were able to engage with mothers with whom a secure attachment had been established, so that social interactions during snack reflected their relationship history. It is also possible that their mothers' behavior patterns facilitated the child's development of emotional regulation, although the results of such support may not be measurable until later in childhood or adolescence when manifestations of competence in social situations are more complex and diverse. Alternatively, it is possible that mothers with an engaged interaction style were more sensitive and aware of their child's social behavior with others, thus their reports were less biased than disengaged mothers. Overall, it appears that children with a difficult temperament and unresponsive mothers are at a psychosocial

risk, while an easy temperament buffered the influence of an unsupportive maternal interactive style. The findings uphold the view that easy temperament characteristics facilitate sociability (Prior, 1992; Rutter, 1987).

The subsequent measures of prosocial expressiveness, after adjusting for temperament difficulty, were predicted by the child's interactive style but not the mother's. The child's social behaviors with mother during snack at 12 and 24 months indeed carried over to social interactions in other settings and with other partners at 24 and 36 months. However, the variance explained by the child behavior patterns was small at both observations periods. Since child interactive style is defined in relation to the mother's behavior pattern, this finding indirectly points to the importance of maternal controlling behaviors and verbal responsiveness for subsequent social autonomy.

In the second year, a period in which child autonomy was associated with maternal responsiveness, the least expressive children were those having a compliant disengaged interaction style and a difficult temperament. Interestingly, social expressiveness was similar across temperament categories for children with other interactive patterns. It may be that in the second year, children are vulnerable to the lack of maternal verbal encouragement for the child expressiveness. When examined over time, this subset of compliant disengaged children at 24 months had an interactive history at 12 months characterized by the least amount of maternal structure (control) and encouragement (verbal responsiveness). It may be that in the first year, this group of children received little maternal encouragement for their expressiveness, understood themselves to be uninteresting, and without the temperamental tendency towards

sociability, did not express themselves in other social settings at 24 months. In the second year, the ability to self evaluate along with a growing awareness of the social cues that regulate behavior seemed to change the impact of the difficult temperament for social expressiveness. It may be that the importance of maternal responsiveness was not apparent at 36 months because their mothers now responded nonverbally.

In the third year, the vulnerability presented by the difficult temperament category shifted to children with an active disengaged interactive style, who manifested notably less expressiveness in social settings. Since the measures of prosocial expressiveness were similar across temperament categories for children with engaged assertive, intermittent engaged and compliant disengaged interactive styles at 36 months, it may be that some experience of maternal responsiveness buffers the influence of difficult temperament in the third year. When the subset of children with an active disengaged style and difficult temperament are examined over time, it seems reasonable to speculate that the interactive history of maternal unresponsiveness in combination with controlling behavior conveyed her disapproval and instilled the child with a sense of rejection, unworthiness and isolation. Such interpretations are congruent with the thinking that the effectiveness of parenting styles varies according to child temperament types (Kochanska, 1995).

Both child compliance and disruptiveness differed according to interactive styles after adjusting for temperament difficulty, although the results are unreliable due to the small cell sizes. The small number of children reported as having a difficult temperament at 12 months ($n = 7$) were distributed between the 4 interactive styles. However, the

findings also support the curvilinear relationship between emotionality, sociability and activity described by Ravel (1995): engaged assertive children who are highly social, yet emotional and active (difficult temperament category) may become excited and respond aggressively -- manifested as little compliance or more disruptiveness. Similarly, active disengaged children, who are less social but similarly emotional, may be overwhelmed by others' excitement or distress and respond anxiously (disruptiveness) or withdraw from the social interaction (decreased compliance).

Limitations of the Study

Observational Bias

A possible limitation to this study is observational coding bias. The Snack Scale coding scheme was developed by the investigator of the present study and the primary investigator of the larger study, who were both involved in the execution of the observational sessions. The primary investigator of the present study also coded the majority of the video-tapes; the primary investigator of the larger study served as the reliability coder for the Snack Scale and for the two scales used to examine the validity of the Snack Scale. Additionally, two follow up studies have been executed by the primary investigator of the present study (at the children's ages of 48 months and when the children were in kindergarten), both concurrent with the analysis of the present study. Thus, both researchers were familiar with the mother-child subjects over the course of the 3 years of data collection and 2 years of observational coding, which increases risks of measurement error arising from their subjective responses to specific mothers, children or dyads. The coders were cognizant of the risks surrounding such bias; both maintained a

heightened awareness of their own emotional responses when coding the video-tapes, and alerted each other when concerns arose. Intra-rater reliability was assessed periodically. Additionally, the tapes (a total of 420 observations over 3 periods) were coded according to the year of data collection rather than by dyad, so to minimize bias related to knowledge of previous ratings. Nonetheless, observational coder bias remains a possible source of measurement error.

Measurement Bias

Snack Scale. The analysis of the present study was based on the first 3 minutes of the snack episode. This decision was theoretically based, as the initial period of snack was assumed to highlight the negotiation and coordination required of the dyad around eating. However, this assumption has not been tested. The results of the present study suggest that children displayed a behavioral sensitivity to the context, whereas the behavior patterns manifested by their mothers represented stable behavioral traits. It is possible that children may also be sensitive to the context-over-time. For example, children with "slow-to-warm-up" temperament type may exhibit a different interactive style after a brief period of adjustment to a new context. Thus, the results of the present study can only be generalized to the first 3 minutes of the snack interaction until further data is available regarding the stability of behavior patterns within the context of eating.

NCATS. The instability of the NCATS scale over time was surprising, given that the scale is widely used and highly regarded as tool in research and clinical settings. This finding may be related to the manner in which the tool was employed in the larger mother-toddler study. The teaching task was standardized at each age rather than

providing mothers several options, as is the procedure described in the NCATS manual. It is also possible that the tasks that were used in the three years of data collection were unevenly challenging to the mother-child dyads. Stacking blocks was more demanding at 12 months than were the subsequent tasks. In fact, many of the children succeeded in buttoning and zippering at 24 months as well as with drawing a line, circle and a square at 36 months. Furthermore, the teaching task was presented in a different sequence at 12 months than at 24 and 36 months. The teaching episode followed mother and child free play at 12 months, which may have confused the child as blocks are often considered toys. In contrast, teaching occurred after ball play and before the play episode at 24 and 36 months. Interestingly and somewhat supportive of this line of thinking, the stability coefficients found at the 24 - 36 month interval were the largest -- although none exceeded $\underline{r} = .20$.

All things considered, it is quite possible that the instability of the measure is not reported beyond the first year because the tool has not been used in a longitudinal study. Conceptually, the occurrence of distinct behaviors at one period in time may not predict the occupance of the same behavior at a subsequent time. The strength of the Snack Scale resides in its ability to assess patterns of behavior over time -- the relationship of behaviors between two interactive partners. Thus, the distinct behaviors may (or may not) change over time in relation to the chid's developmental competencies -- yet the overall behavioral patterns endure. Therefore, the validity of the Snack Scale requires further examination, preferably using a measure that was designed by another research team.

Toddler Temperament Scale. The accuracy and validity of maternal reports of child temperament is often identified as a limitation when temperament is a variable of interest in child development research. Little is understood about variations in the accuracy of maternal reports. It may be that the accuracy of maternal reports varies systematically across the maternal traits which are related to her interactive style opposed to the characteristics of the family environment. Likewise, the reports of children's social behavior in other settings with other interactive partners also relied on mothers' reports. It may be that some mothers are more accurate reporters than others. For example, mothers who manifest a contingent responsiveness to their child may be more observant and aware of the characteristics of their child's behavior, and therefore provide more accurate reports. Confidence in the findings related to maternal reports will be enhanced as sources of measurement error are explored.

Adaptive Social Behavioral Inventory . The internal consistency of the disrupt subscale of the Adaptive Social Behavioral Index measure of social competence was notably less than that reported previously (Hogan, Scott & Baur, 1992). The scale was developed for use with a sample of prematurely-born children, therefore it is possible that their mothers' expectations and perceptions of disruptive behavior differed from that of the mothers in the present sample. It is also possible that the different alpha coefficients may be related to the sample sizes, as the scale's reliability was tested with a sample five times larger than the present sample. The lower internal consistency of the disrupt subscale in the present study questions the homogeneity of the items. Thus, the findings of the present study regarding disruptiveness must be interpreted cautiously until the

of the present study regarding disruptiveness must be interpreted cautiously until the reliability of the subscale is examined further.

Generalizability

While the sample size was adequate for establishing the reliability and validity of the Snack Scale, understandings about the joint contributions of temperament and interactive style were limited by the uneven distribution of child temperament types across the four classifications of child behavior styles. Mothers who were less confident of their parenting skills or who perceived their infants as difficult may have declined participation in the larger study, as its purpose was described as examining "what it takes for mothers to raise a child during toddlerhood." The present sample consists of mothers who participated in all three years of data collection, so that attrition presented another form of self-selection. Thus, understanding about the relationships between interactive behavior style and temperament require further research before being generalized beyond the present sample.

Summary and Recommendations

Reliability of the Snack Scale

This study established the reliability and stability of the Snack Scale for assessing the nature of mother-child interactive behavior in an eating episode during toddlerhood. Interrater reliability, assessed as Cohen's kappa, was established within each data collection period. The reliability coefficients for the ratings of maternal and child classifications were consistently strong (.83 - .93), while those for dyadic fit ratings and affect were adequate (.60 - .87, dyadic fit; .57 - .68, maternal affect; .58 - .77, child

affect). The internal consistency of the coding scheme was demonstrated using discriminant function and chi square analyses. Maternal responsiveness and controllingness were identified as salient maternal interactive dimensions throughout toddlerhood. In contrast, child responsiveness and other-directed autonomy varied according to the child's age and related developmental competencies. The examinations of the stability of the measures demonstrated the scale's sensitivity to the developmentally related changes in dyadic interactions. Stability was found between the assignments of maternal classification over every interval, while the assignments of child classification were stable over 1-year intervals (12-24 months and 24-36 months) and dyadic mutuality was stable only between 12 - 24 months. The scale components of maternal and child interactive style, dyadic mutuality and affect were significantly related at each observation period.

Although the reliability of the Snack Scale was clearly demonstrated, it was established with the same sample used to create the scale and coded by the scale's authors. Therefore, reliability should be confirmed in a second study. The ratings should be made by observational coders who are blind to the subjects as well as to the study hypotheses. Since it may be that maternal and child interactive behaviors are affected by other variables, such as fatigue, hunger, and time of day, such potential sources of measurement error should be measured and examined.

Validity of the Snack Scale

The validity of the Snack Scale was established as both convergent and construct validity. Overall, the results indicated that some maternal interactive qualities were

consistent across the contexts of snack, play and teaching. Evidence of convergent validity was found using two established observation measures, the Child Autonomy Balance Scale (play) and the Nursing Child Assessment Teaching Scale (teaching). Maternal interactive behavior was consistently related across all contexts, whereas child interactive behavior seemed to be context-sensitive. The stronger convergent validity found with the measures of maternal behaviors supports other literature in which maternal interactive behavior is understood as an inherent trait. The immaturity of the child was reflected in the weak associations between child behaviors across interactive contexts. The measures of dyadic interactive styles, dyadic mutuality, and maternal and child affect were similarly distinguished across contexts, although not at all observation periods. Construct validity was suggested in that significant effect sizes were found when maternal interactive styles were used to predict the child's manifestation of social behaviors. Likewise, children's engagement with their mothers during snack predicted their prosocial expressiveness with others.

Questions remain regarding the extent to which maternal interactive quality is affected by contextual variables, and how maternal interactive patterns may be more readily demonstrated in some contexts than in others. These questions could be examined in a generalizability study. Validity may be enhanced with observations in the home setting as well as in the laboratory, which would provide a familiar setting for dyadic interactions. Additionally, understandings about children's social behaviors would be furthered by examining their interactions as reported by a second primary caregiver (i.e., father, grandmother), exploring the extent to which maternal-child interactive styles are

carried forward to other important social relationships. Likewise, collecting the second primary caregiver's perspective of the child's social behaviors with others would further strengthen the Snack Scale's validity.

Joint Contributions of Interactive Style and Temperament

The results of this study supported the hypothesis that the development of social competence has its foundations in early maternal-child social interactions. Although temperament difficulty was inversely correlated with social competence at every observation period, it was somewhat mediated by the quality of mother-child interactions. Children with a difficult temperament appear less socially apt with others, but the majority of children with a difficult temperament in this sample manifested an engaged interaction style with their mother during snack. This finding suggests that the foundations of social behaviors originate in the style of attachment security, further supporting the view that attachment security established during infancy is carried forward to social interactions during toddlerhood (Carlson & Sroufe, 1995).

Further research is needed to examine the relationship between temperament difficulty and social competence. The categorical variable of temperament type could be utilized to explore differences between children's social behaviors with others in relation to maternal interactive styles and child temperament. The definition of difficult temperament could be explored by modifying the category to include children with a "difficult-to-warm-up" temperament type. Additionally, existing data could be utilized to examine the relationships between social competence and self concept, self esteem and autonomy, which are understood to be integrated and manifested as social competence.

Interactive styles also need to be examined with regard to maternal attachment styles and child attachment security, which provide insight into interactive histories.

Implications for Nursing

The findings from this study support the importance of the maternal-child interactive relationship for the child's ongoing social development. Since mealtimes and snack provide consistent opportunities for the young child to experience social exchanges with mother, eating situations are a particularly salient setting for assessing the development of social competence. Furthermore, maternal behaviors must be considered as important to the child's social behaviors, as the interactive styles of both mother and child throughout toddlerhood were distinguished by the balance between a mother's controllingness and her verbal responsiveness.

Topics for anticipatory guidance are highlighted throughout this study, which will strengthen parental understandings about their child's early social development. Healthcare providers can emphasize snack and mealtime as ongoing opportunities for social interactions -- a naturally occurring "quality time" that working parents may feel pressured to arrange. Eating situations can be presented as enjoyable, pleasurable occasions rather than stressing the nutritional issues surrounding eating. Additionally, parents may benefit knowing that their directiveness is as important as their responsiveness and following of their child's initiations.

The Snack Scale provides a tool for assessing social development through routine interactions and within a familiar context. The mutuality rating provides a tool for globally assessing dyadic risk. Although the tool cannot identify the source of the risk, it

does provide a quick and reliable screening mechanism. Further assessments of maternal and child interactive styles contribute specific information regarding individual contributions to the dyadic regulation. The Snack Scale identifies the salient behaviors within specific developmental periods, which may direct the formation of intervention plans.

Social development has its roots in early social interactions. Its assessment requires the application of broad assessment skills in conjunction with knowledge of developmental processes and tasks. It is intuitive that social behaviors emerge through and are manifested in interactions with the primary caregiver, for this person structures and likely dominates the child's initial life experience. The early social exchanges with mother may provide a meaningful approach to the assessment of children's interactive behaviors as well as interventions to facilitate their social development.

REFERENCES

Achenbach, T.M. (1991). Manual for the Child Behavior Checklist/4-18 and 1991 Profile. Burlington, VT: University of Vermont Department of Psychiatry.

Achenbach, T.M. (1987). Manual for the Teacher's Report Form and 1991 Profile. Burlington, VT: University of Vermont Department of Psychiatry.

Ainsworth, M., Blehar, M., Waters, E., & Wall., S. (1978). Patterns of Attachment. Hillsdale, NJ: Lawrence Erlbaum Associates.

Bardone, A.M., Moffitt, T.E., Caspi, A., Dickson, N., Stanton, W.R. & Silva, P.A. (1998). Adult Physical Health Outcomes of adolescent girls with conduct disorder, depression, and anxiety. Journal of American Academy of Child and Adolescent Psychiatry, 37, 594-601.

Barnard, K., Hammond, M., Booth, C., Bee, H., Mitchell.., S. & Spieker, S. (1989). Measurement and meaning of parent-child interaction. In F. Morrison, C. Lord & D. Keating. (Eds.). Applied Developmental Psychology (Vol. III). New York: Academic Press.

Brazelton, T.B. (1973). Neonatal Behavior Assessment Scale. London: Spastics International Medical Publications.

Baumrind, D. (1967). Child care patterns anteceding three patterns of preschool behavior. Genetic Psychological Monographs, 75, 43-88.

Bretherton, I. (1980). Young children in stressful situations: The supporting role of attachement figures and unfamiliar caregivers. In G.V. Coelho, P Ahmed, (Eds.). Uprooting and Attachment. New York: Plenum Press.

Bretherton, I. (1985). Attachment theory: Retrospect and prospect. In I. Bretherton & E. Waters (Eds.). Monographs of the Society for Research in Child Development, 50, 3-39.

Beck, C.T. (1996). A meta-analysis of the relationship between postpartum depression and infant temperament. Nursing Research, 45, 225-230.

Booth, C.L.& Houck, G. M. (1987). Control-autonomy balance scales. Unpublished Manual. University of Washington, Seattle, WA.

Bowlby, J. (1982). Attachment and loss: retrospect and prospect. American Journal of Orthopsychiatry, 52, 664-678.

Brier, N. (1995) Predicting antisocial behavior in youngsters displaying poor academic achievement: A review of risk factors. Developmental and Behavioral Pediatrics, 16, 27-276.

Bretherton, I. (1985). Attachment theory: Retrospect and prospect. In I. Bretherton & E. Waters (Eds.). Growing points of attachment theory and research (pp. 3-38). Monographs of the Society for Research in Child Development, 50(1-2, Serial No. 209).

Calkins, S.A. (1994). Origins and outcomes of individual differences in emotional regulation. Monographs of the Society for the Society for Research in Child Development, No. 59) 59, 53-72, 250-283.

Carey, W.B. (1985). Interactions of temperament and clinical conditions. Advances in Developmental and Behavioral Pediatrics, 6, 83-115.

Carey, W.B. & McDevitt, S.C. (1978). Revision of the infant temperament questionnaire. Pediatrics, 61, 735-739.

Carlson, E.A. & Sroufe, L.A. (1995). Contributions of attachment theory to developmental psychopathology. In D Cicchetti & DJ Cohen (Eds.). Developmental Psychopathology, Vol 1: Theory and Methods (581-617), John Wiley & Sons.

Cassidy, J. (1990). Theoretical and methodological considerations in the study of attachment and the self in young children. In M.T. Greenberg, D. Cicchetti & E.M. Cummings. (Eds.). Attachment in Preschool Years: Theory, Research and Intervention, Chicago: Universtiy of Chicago Press.

Chattor, I., Hirsch, R. & Persinger, M. (1998). Facilitating internal regulation of eating: A treatment model for infantile anorexia. Infants & Young Children, 10, 12-22.

Cicchetti, D. (1987). Developmental psychopathology in infancy: Illustrations from the study of maltreated youngsters. Journal of Consulting and Clinical Psychology, 55, 837-845.

Coffman, S., Levitt, M.J. & Guacci-Franco, N. (1995). Infant-mother attachment: Relationships to maternal responsiveness and infant temperament. Journal of Pediatric Nursing, 10, 9-18.

Connell, J.P. (1990). Context, self, and action: A motivational analysis of self-system processes across the life span. In D. Cichetti & M. Beeghly (Eds.), The self in transition: Infant to childhood (pp. 61-97). Chicago: University of Chicago Press.

Crockenberg, S. and Littman, C. (1990). Autonomy as competence in 2-year olds: Maternal correlates of child defiance, compliance and self-assertion. Developmental Psychology, 26(6), 961-971.

Denham, S.A. (1993). Maternal emotional responsiveness and toddlers' social-emotional competence. Journal of Child Psychology, 34, 715-728.

Denham, S.A. & Grout, L. (1993). Socialization of emotion: Pathway to preschoolers' emotional and social competence. Journal of Nonverbal Behavior, 17, 205-227.

Dumas, J.E., Serketich, W.J. & LaFreniere, P.J. (1995). "Balance of power": A transactual analysis of control in mother-child dyads involving socially competent, aggressive, and anxious children. Journal of Abnormal Psychology, 104, 104-113.

Dunham, P. & Dunham, F. (1995). Optimal social structures and the adaptive infant development. In C. Moore, P. Dunham, (Eds.). Joint Attention: Its Origins and Role in Development. Hillsdale, NJ: Erlbaum.

Emde, R., Gaensbauer, T., & Harmon, R. (1976). Emotional expression in infancy: A biobehavioral study. Psychological Issues Monographs, 10, 1 (No. 37).

Egeland, B., Kalkoske, M., Gottesman, N. & Erickson, M.F. (1990). Preschool behavior problems: Stability and factors accounting for change. Journal of Child Psychology and Psychiatry, 31, 891-909.

Fagot, B.I & Leve, L.D. (1998). Teachers ratings of externalizing behavior at school entry for boys and girls: Similar early predictors and different correlates. Journal of Child Psychology and Psychiatry, 39, 555-566.

Field, T.M., Woodston, R., Greenberg, R. & Cohen, D. (1982). Discrimination and imitation of facial expressions by neonates. Science, 146, 668-670.

Fullard, W., McDevitt, S.C. & Carey, W.B. (1984). Assessing temperament in one- to three-year old children. Journal of Pediatric Psychology, 9, 205-217.

Gaussen, T. & Stratton, P. (1985). Beyond the milestone model-- a systems framework for alternative infant assessment procedures. Child: Care, Health and Development, 11, 131-150.

Goldberg, S., MacKay-Soroka, S. & Rochester, M. (1994). Affect, attachment and maternal responsiveness. Infant Behavior and Development, 17, 335-339.

Gortmaker, S.L., Walker, D.K., Weitzman, M. & Sobol, A.M. (1990). Chronic conditions, socioeconomic risks, and behavioral problems in children and adolescents. Pediatrics, 85, 267-276.

Gross, D. (1989). Implications of maternal depression for the development of young children. Image: Journal of Nursing Scholarship, 21, 103-107.

Grusec, J.E. & Lytton, H. (1988). Social Development: History, Theory and Research. New York: Springer-Verlag.

Hay, D. (1994). Prosocial development. Journal of Child Psychology and Psychiatry, 35, 29-71.

Hay, D.F. & Rheingold, H.L. (1983). The early appearance of some valued social behaviors. In D.L. Bridgemen (Ed.), The Nature of Prosocial Development: Interdisciplinary Theories and Strategies (pp. 73-94). New York: Academic Press.

Haviland, J. & Lelwica, M. (1987). The induced affect response: 10-week old infants' responses to three emotional expressions. Developmental Psychology, 23, 97-104.

Hogan, A., Scott, K.G., & Baur, C.R. (1992). The adaptive social behavior inventory (ASBI): A new assessment of social competence in high-risk three-year olds. Journal of Psycheducational Assessment, 10, 230-239.

Houck, G.M. (1999). The measurement of child characteristics from infancy to toddlerhood: Temperament, developmental competence, self-concept, and social competence. Issues in Comprehensive Pediatric Nursing, 22, 101-127.

Houck, G.M. (1998). Personal communication.

Houck, G.M. (1997). [Mother-child interactions and adaptation of toddlers]. Unpublished raw data.

Houck, G.M., Booth, C.L., & Barnard, K.B. (1991). Maternal depression and locus of control orientation as predictors of dyadic play behavior. Infant Mental Health Journal, 12(4), 347-360.

Houck, G.M. & Spegman, A.M. (1999). Snack Scale Coding Manual. Unpublished manual. Oregon Health Science University, Portland, OR.

Houck, G.M. & Spegman, A.M. (1999b). The development of self: Theoretical understandings and conceptual underpinnings. Infants and Young Children, 12, 1-16.

Houldin, A., Fullard, W. & Heverly, 1989. Toddler temperament and quality of the child-rearing environment. Pediatric Nursing, 15, 491-496.

Kaye, K. (1982). The Mental and Social Life of Babies. Chicago: University of Chicago Press.

Kinderman, T. & Skinner, E.A. (1988). Developmental tasks as organizers of children's ecologies: Mothers' contingencies as children learn to walk, eat and dress. In J. Valsiner, (Ed.). Child Development within Culturally Structured Environments, Vol 2: Social Co-construction and Environmental Guidance in Development, (pp. 66-105). Norwood, NH: Ablex Publishing.

Klecka, W.R. (1980). Discriminat Analysis, Series: Quantiative Applications in the Socail Sciences. Newbury Park: Sage Publications.

Kochanska, G. (1995). Children's temperament, mothers' discipline, and security of attachment: Multiple pathways to emerging internalization. Child Development, 66, 597-615.

Kochanska, G. & Aksan, N. (1995). Mother-child mutually positive affect, the quality of child compliance to requests and prohibitions, and maternal control as correlates of early internalization. Child Development, 66, 236-254.

Koshanska, G., Murrary, K., Jacques, T.Y., Koenig, A.L. & Vandergeest, K.A. (1996). Inhibitory control in young children and its role in emerging internalization. Child Development, 67, 490-507.

Kopp, C.B. (1982). Antecedents of self-regulation: A developmental perspective. Developmental Psychology, 18, 199-214.

Johnson, S.L. & Birch, L.L. (1994). Parents' and children's adiposity and eating style. Pediatrics, 94, 653-661.

Lay, K., Waters, E. & Park, K.A. (1989). Maternal responsiveness and child compliance: The role of mood as a mediator. Child Development, 60, 1405-1411.

LeCuyer, L. E. (1996). Maternal sensitivity and responsiveness in the transition to toddlerhood. Unpublished doctoral dissertation, Oregon Health Sciences University, Portland.

Lewis, M. (1997). The self in self-conscious emotions. In J.G. Snodgrass, R.L Thompson (Eds.). The Self Across Psychology; Self-recognition, Self-awareness, and the Self Concept. Annals of the New York Academy of Sciences, Vol. 818. New York: New York Academy of Sciences.

McCall, R.B. (1981). Nature-nature and the two realms of development: A proposed integration with respect to mental development. Child Development, 52, 1-12.

Medoff-Cooper, B. (1995). Infant temperament: Implications for parenting from birth through one year. Journal of Pediatric Nursing, 10, 141-145.

Meltzoff, A.N. (1985). An immediate and deferred imitation in 14 and 24 month old infants. Child Development, 56, 62-72.

Meltzoff, A.N. (1990). Foundations for developing a concept of self: The role of imitating in relating self to other and the value of social mirroring, social modeling, and self practice in infancy. In D. Cichetti & M. Beeghly (Eds.), The self in transition: Infant to childhood (pp.139-164). Chicago: University of Chicago Press.

Melvin, N. (1995). Children's temperament: Interventions for parents. Journal of Pediatric Nursing, 10, 152-159.

Mize, J. & Pettit, G.S. (1997). Mothers' social coaching, mother-child relationships style, and children's peer competence: Is medium the message? Child Development, 68, 312-332.

Okagaki, L. & Divecha, D.J. (1993). Development of parental beliefs. In T. Luster & L. Okagaki (Eds.). Parenting: An Ecological Perspective (pp. 35-68). Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Parker, J.G., Rubin, K.H., Price, J.M., DeRosier, M.E. (1995). Peer relationships, child development and adjustment: A developmental psychopathology perspective. In D. Cicchetti, K.J. Cohen, (Eds.). Developmental Psychopathology, Vol 2: Risk, Disorder and Adaptation (pp. 96-161). New York: John Wiley & Sons.

Parker, J.G. & Asher, S.R. (1987). Peer relations and later adjustment. Psychological Bulletin, 102, 357-389.

Pederson, D.R., Moran, G., Sitkno, C., Campbell, K., Ghesquire, K. & Action, H. (1990). Maternal sensitivity and the security of infant-mother attachment: A Q-Sort Study. Child Development, 61, 1974-1983.

Prior, M. (1992). Childhood Temperament. Journal of Child Psychology and Psychiatry, 33, 249-279.

Raver, C.C. (1996). Relations between social contingency in mother-child interaction and 2-year olds' social competence. Developmental Psychology, 32, 850-859.

Rheingold, H.L., Cook, K.V., & Kowlowitz, V. (1987). Commands activate the behavior and pleasure of 2-year-olds. Developmental Psychology, 23, 146-151.

Roberts, W. & Strayer, J. (1987). Parent responses to the emotional distress of their children: Relations with children's competence. Developmental Psychology, 23(3), 415-422.

Robinson, J., Little, C. & Biringen, Z. (1993). Emotional communication in mother-toddler relationships: Evidence for early gender differentiation. Merrill-Palmer Quarterly, 39, 496-517.

Roe, K.V. & Drivas, A. (1997). Reciprocity in mother-infant vocal interactions: Relationship to the quantity of mothers' vocal stimulation. American Journal of Orthopsychiatry, 67, 645-649.

Rose-Krasnor, L. (1997). The nature of social competence: A theoretical Review. Social Development, 6, 111-135.

Ross, H.S. & Lollis, S.P. (1987). Communication within infant social games. Developmental Psychology, 23, 241-248.

Rubin, K.H., Hastings, P.D., Stewart, S.L., Henderson, H.A. & Chen, X. (1997). The consistency and concomitants of inhibition: Some of the children, all of the time. Child Development, 68, 467-483.

Rubin, K.H. & Rose-Krasnor, L. (1992). Interpersonal problems solving and social competence in children. In V.B. Van Hasselt & M. Hersen (Eds.). Handbook of Social Development: A Lifespan Perspective, (pp. 283-323). New York: Plenum Press.

Rutter, D.R. (1989). Pathways from childhood to adult life. Journal of Child Psychology and Psychiatry, 30, 23-51.

Sameroff, A.J. & Chandler, M.J. (1975). Reproductive risk and the continuum of caretaking causality. In F. Horowitx, M. Hetherinton, S. Scarr-Scharpatik & G. Siegel (Eds.), Review of Child Development Research (Vol. 4) (pp. 187-243). Chicago: University of Chicago Press.

Sander, L.W. (1977). The regulation of exchange in the infant-caregiver system and some aspects of the context-content relationships. In M. Lewis & L.A. Rosenblum (Eds.), Interaction, Conversation, and Development of Language. New York: Wiley.

Sander, L.W. (1976). Issues in early mother-child interaction. In E.N. Rexford, L.W. Sander & T. Shapiro (Eds.). Infant Psychiatry (pp. 127-147). New Haven, CT: Yale University Press.

Scott & Hogan (1987). Adaptive Social Behavior Inventory. Miami, FL: University of Miami.

Seifer, R. & Schiller, M. (1995). The role of paterning sensitivity, infant temperament, and dyadic interaction in attachment theory and assessment. Monographs of the Society for Research in Child Development, 60(Serial No. 210)., 146-174.

Skinner, E.A. (1986). The origins of young children's perceived control: Mother contingent and sensitive behavior. International Journal of Behavioral Development, 9, 359-382.

Spanger, G. (1990). Mother, child and situational correlates of toddlers' social competence. Infant Behavior and Development, 13, 405-419.

Sroufe, L.A. & Rutter, M. (1984). The domain of developmental psychopathology. Child Development, 55, 17-29.

Stafford, L. & Bayer, C.L. (1993). Interactions Between Parents and Children. Newbury Park: Sage Publications.

Stern, D. (1985). The Interpersonal World of the Infant. New York: Basic Books.

Sumner, G & Spietz, M. (1994). NCAST Teaching Manual: Caregiver/Parent-Child Interaction. Seattle: University of Washington.

Tabachnick, B.G. & Fidell, L.S. (1996). Using Multivariate Statistics (3rd Ed.). New York: Harper Collins College Publishers.

Thomas, A. & Chess, S. (1977). Temperament and Development. New York: Brunner/Mazel.

Toga, S. & Fogel, A. (1993). Infant response to the still-face situation at 3 and 6 months. Developmental Psychology, 29, 532-538.

Valtolin, G. & Ragazzoni, P. (1995). Systematic perspective on obesity in childhood: a preliminary study on power interactions between mother and child. Psychological Reports, 77, 1219-1228.

Vondra, J. & Belsky, J. (1993). Developmental origins of parenting: Personality and relationship factors. In T. Luster & L. Okagaki (Eds.). Parenting: An Ecological Perspective (pp. 1-34). Hillsdale, New Jersey: Lawrence Erlbaum Associates

Yockelson, S.J. (1998). Identification of infants and young children with social-emotional problems. Infants & Young Children, 10(3), 10-18.

Zahn-Waxler, C. & Radke-Yarrow, M. (1990). Origins of empathetic concern. Motivation and Emotion, 14, 107-130.

Zlochower, A.J. & Cohn, J.F. (1996). Vocal timing in face-to-face interaction of clinically depressed and nondepressed mothers, and their 4-month-old infants. Infant Behavioral Development, 19, 371-374.

Appendix A

Snack Scale

SNACK CODING MANUAL

Gail Houck

Adele Mattinat Spegman

Oregon Health Science University

January, 1999

This coding scheme was developed to assess the pattern of maternal and child interaction during a snack situation. The coding system was designed to classify mothers on the basis of their engagement and control during the snack interaction, and to classify children according to their engagement and autonomy. The coding scheme was intended to tap the quality of these dimensions as they were manifested in 2 components of a snack setting:

1) the verbal interaction and the extent to which the child was engaging with maternal connectedness and their enjoyment in the social process of conversing and

2) the negotiation of feeding/eating the snack and the extent to which the mother facilitated (vs. controlled) developing child autonomy in this regard.

The coding system was developed for videotaped observations of mothers and their children, during a snack period, at 12, 24, and 36 months of age. Accordingly, the snack setting was altered to accommodate the child's growing capacities. At 12 months, a high chair was brought into the observational laboratory. The mother's chair was placed to the left of the high chair and the snack tray was placed on a child-sized table to the left of her chair; all mothers placed their infants in the high chair. The mothers then either placed snack items on the high chair tray for the child to eat/drink, gave the items to the child, or fed the child. At 24 and 36 months, a child-sized table and chairs were in the observation room. The tray of snack foods was placed on the table, positioned between the mother and the child.

Videotaping was carried out through a one-way mirror in the laboratory setting. At every age, the mother was instructed by the researcher, when bringing in the snack tray, that this task was a "break" for them but that the camera would continue to record. She was told to inform us when they were finished or we would check back with her in 10 minutes. No other instructions were provided. At 24 and 36 months, the only other furniture in the room included a chair (used by the mother at 12 months), a lamp table with a lamp, and a floor lamp; there were no toys or other play items available to the child. The snack

situation was terminated when 1) the mother signaled before 10 minutes (rare), 2) when the researcher entered the lab after 10 minutes, or 3) when the mother signaled the completion of the segment after the 10-minute check.

The snack coding scheme was developed for the first 3 minutes of the videotaped interaction. The 3-minute coding period commenced when the infant was in the high chair and either the mother offered the first food item or the child made the first bid for food. There are 4 parts to the coding system: a) maternal and child behavioral frequencies; b) maternal and child behavioral classifications; c) a rating of dyadic mutual adaptation; and d) maternal and child affect ratings. The emphasis in this coding scheme was twofold. First, there was a concern for the nature and amount of child assertions in relation to maternal facilitation and inhibition of such autonomy. Balance in this regard may be manifested in any social conversation as well as in the negotiation and coordination of feeding/eating the snack. Second, there was a concern for the nature and amount of engagement or connectedness and enjoyment evidenced by the mother and child, evidenced primarily in the social conversation that typically attends the snack situation.

BEHAVIOR CODES

The first part of the coding system involved counting the frequencies of verbal and nonverbal behaviors indicating autonomy/control and engagement: child autonomy, child follow, mother direct (autonomy facilitating vs. behavior controlling), and mother follow. Actual frequency counts of these behaviors were made throughout the three-minute taped snack observation, and were entered into columns on the coding form.Behaviors are counted when topic changes rather than within topics.

Child Autonomy. Child autonomy entails the child's self assertions during the snack interaction. Autonomous behaviors are manifested as initiations of activity, initiations of conversational topics, assertions of needs, assertions of preference or choice, protestations, or refusals in response to maternal questions or presentation of choice. Such behaviors include both verbalizations and nonverbal behaviors

that are independent of the mother's verbalizations or behavioral actions; that is, they are not contingently responsive to maternal verbal or nonverbal behavior. Generally, a 3- or 5-second pause is considered sufficient opportunity for the infant to respond to the mother; any vocalization/verbalization thereafter is counted separately. Self-assertions are coded as *self-directed autonomy* and *other-directed autonomy*.

Self-directed autonomy refers to verbal and nonberbal behaviors that are self-occupied and contained way that excludes or ignores the mother. Nonverbal self-directed autonomy includes disengagement cues, such as looking away from mother, looking at the ceiling or elsewhere, when the mother is trying to engage the child or is verbalizing to the child. Other examples include feeding oneself, solo play and repetitive activities, such as kicking and noises, and imitating or mimicing mother's behavior at a molar level. Self-directed verbalizations do not carry intents to communicate to the mother nor expectations for her response. Eating behaviors are self-directed when the child changes to a new food item. If a child rejects a snack item but subsequently chooses it, or if the mother presents one item and then another and the child chooses the first item, these actions are scored as self-directed autonomy.

Other-directed autonomy are behaviors in which the child's agenda is conveyed to the mother. This includes verbal and nonverbal behaviors that indicate a need, preference or choice as well as child initiations of games, stories, actions or conversation topics. "Interactional behavior" often accompanies other-directed vocalizations, such as eye contact and physical orientation towards the mother. Such behaviors suggest an expectancy for the mother's response.

Conventional communicative gestures, such as pointing, reaching, pushing away, or nodding, are examples of nonverbal other-directed autonomy. Any verbalization that involves a statement of need/want, preference, choice, or refusal in relation to the snack activity is considered an expression of

other-directed autonomy. Responses to maternal questions or presentation of choice, when in agreement with an agenda suggested by mother, are coded as follow. Eating behavior is counted as other-directed when it represents a self-assertion directed to the mother. Thus, food refusals and preferences are both examples of other-directed autonomy along with requests for assistance and child feeding mother.

Child Follow. Child behavior that follows or adopts the mother's topic, activity, or direction is counted as follow. Following the mother's topic will typically be observed in the conversation. At 12 months, this will likely be in the form of imitating vocal sounds or efforts to repeat words, which may be a vocal sound or word approximation rather than the actual word. At 24 months, verbal skills will vary but it is more clear that the child is responding to mother and conveying an idea related to her topic. At 36 months, the responsiveness to the mother's topic should be clear. When the mother asks the child's preference or presents a choice for snack items, the child's statement of preference, choice, or concurrance is coded as a follow. Rejection is coded as an other-directed autonomy. There is no "delayed" following. Child follow must be contingent to the mother's behavior and "on topic". It may also reflect compliance with a mother's directive.

Mother Direct. Maternal directive behavior includes changes or maintance of topics in the face of child autonomy. Such behaviors may be observed verbally and nonverbally or behaviorally, and are characterized in two ways: autonomy facilitating and behavior controlling.

Facilitating directs. Verbally, facilitating directs carry an intention to socialize and teach rather than control, and includes social conversation, initiations of social conversation, or introducing any topic of conversation. Such behaviors include conversation and information-seeking questions ("Would you like some juice?"), explanations ("You need to drink slowly"), and instructions that are suggestive in tone rather than commanding ("Put the top on like this"). Voice tone is crucial to the nature of verbal directs; those that are positive and instructive or "teaching" in tone are more socially facilitating whereas those that carry a negative tone are more likely to be behavior controlling.

Nonverbal facilitating directs entails behavior that supports the child's developing autonomy, especially around eating. Behavior that facilitates autonomy includes laying out the food items or showing food items in a way that the child may assert a choice or preference, or providing food in a way that the child can self-pace the feeding and drinking.

Behavior controlling directs are maternal behaviors that constrain the behavior of the child; the mother expects compliance. Such behaviors can be directions or corrections following child autonomy (initiations), whether the child's autonomy was self-directed or other directed and verbal or behavioral. Thus, although the mother may appear to be following a topic initiated by the child, she is directing a change in the child's agenda.

Commands will typically carry heavy constraint on the child's behavior, allowing no alternatives or substitutions on the part of the child. They are often marked by the deletion of a grammatical subject; other forms specify the desired agent and behavior ("No..."; "Sit down"). Indirect commands are softened some or are less specific. They also serve to constrain the child's behavior and include requests ("Would you please just drink your juice?/eat?/sit down?"), suggestions ("How about drinking your juice/eating your cracker?/sitting down?"), complaints ("Oh, great; nice mess!"), demands ("I want you to drink your juice/eat that now/sit down now"), and threats ("If you spill that..."; "Want a spanking?").

Voice tone carries a fair amount of weight in determining whether maternal utterances are coded as facilitating vs. behavior controlling. In addition, the form of the sentence or how elaborated the sentence is will aid the determination as well, e.g. "Say juice..." vs. "Can you say juice?" or "*Juice*...Here is your *juice.*" The same factors, voice tone and sentence form, will serve the distinction for social routines (please; thank you; hello; excuse you; bless you).

Nonverbal behavior controlling directs constrain the child's behavior and/or autonomy, especially with respect to eating/drinking. Such behavior typically implies a command if it is not accompanied by a verbal command or directive. Behavior controlling directs include feeding the child

juice from the tippy cup, offering food items according to the mother's agenda, limiting choice in some way (as with putting lid on container), cleaning up foods (except spilled juice), and ignoring or interfusing the child's autonomous cues. Any behavior that physically directs, controls, or constrains the child--e.g. manipulating the child's hand, pushing the hand, positioning the hand--is considered behavior controlling.

Mother Follow. Maternal follow is verbal or nonverbal contingent responding to the child's overture, cue, or bid. Maternal responses remain within the child's topic and intention, and entails interactive behavior and timing that allows for the child to continue or expand the topic. Verbal or nonverbal following serves to maintain, elaborate, or repeat the child's previous utterance, or to acknowledge, confirm or respond to a question, or to clarify.

Verbal follow. Mother verbal follow can be thought of as following into two categories: facilitating and acknowledging. *Facilitating follows* are social in nature and more conversant, reflective enhancing communications. They include maternal reflections on the non-observable feelings and/or experiences that are contingent on child behavior. The mother may verbalize her understandings of the motivations underlying her child's behavior ("you seem to want to do this yourself") or speculate on how the child may be feeling ("you seem hungry, unhappy"). The mother's verbal following brings things to the level of social conversation. *Acknowledging follows* are verbal responses to the child's agenda. These responses focus on the observable component of child behavior and may include labeling, descriptions, or comments about what the child is doing. This includes descriptions (apple juice is good") and questions (descriptions in question form) about the child's activity ("are you drinking from a red cup?").

Behavioral follow. *Behavioral follow* includes any nonverbal behavior that is contingently responsive to child cues, especially those autonomous cues around eating and social interaction. Behavioral following include waving back, and reaching for a food item that the child has pointed towards. Merely watching or looking at the child does not count as following.

BEHAVIOR PROPORTIONS

Child autonomy = OD/OD+SD

SD/OD+SD

OD+SD/OD+SD+F

OD/OD+SD+F

SD/OD+SD+F

Child follow =CF/MFD+MBCD

Maternal directs = AF/AF+BC

BC/AF+BC

AF+BC/AF+BC+AF+A+BF

Maternal follow = AF/AF+A+BF

A/AF+A+BF

BF/AF+A+BF

AF+A+BF/COD+CSD

CLASSIFICATIONS

The proportions are used in combination with more qualitative or clinical judgements about maternal and child engagement, and maternal sensitivity in assigning behavior classifications designed to describe the individual's style of interactive behavior in relation to the dyadic partner. The frequencies and proportions are intended to enhance the rigor of the behavioral classification but not to absolutely determine them. The addition of clinical judgement is essential for determining qualitative differences, especially whether maternal directs are autonomy facilitating or behavior controlling.

Child Classifications

Four classifications of child behavior were identified and developed according to how engaged the child was with the mother and according to the nature of the child's self-assertions. Engagement was assessed in terms of the child's perceptual awareness of and responsiveness to the mother, and the verbal and behavioral connectedness between them. Self-assertions were assessed in terms of whether they were

other-directed (to the mother or self-occupied. They were further noted for their level of aggression, protest, or other form of opposition for the sake of opposition. Behavioral proportions of child autonomy (in relation to all child behavior) and child follow (in relation to maternal facilitating and behavior controlling directs) were used to aid in the rigor of behavioral observation and classification but not to directly determine the classification.

Engaged assertive. The engaged-assertive child has nearly equivalent amounts of autonomy and follow. This child's interactive behavior is characterized by engagement with the mother. The child is perceptually alert and responsive to the mother, maintains an ongoing awareness of her, and willingly follows the mother's topics or intentions. At the same time, this child is readily able to assert preferences or needs and express choices to the mother, and introduces his/her own topics of conversation or interest as well. What is notable is that the self-assertions take place in the context of an ongoing, interactive connectedness with the mother. Assertions typically express feelings (excitement, frustration) and suggest an expectancy for maternal response. The activity of eating becomes the background for interactions rather than the focus on the interaction. Typically, at 24 months of age, self-directed autonomy is $\leq$ other-directed autonomy.

Intermittent engaged. The child with an intermittent engaged pattern of behavior also evidences an ongoing perceptual awareness of and responsiveness to the mother, and displays a fair amount of verbal autonomy directed to the mother, *in bouts.* These efforts intermittently result in an actual verbal engagement with her. Although the child spends time engaged in eating or other distractions and/or activities, it is important to note that the child is not ignoring the mother. The child seems to wait and watch for opportunities to play or have fun with the mother. The child's intermittent efforts to connect with the mother do not necessarily carry an expectancy for her response. Food and eating is the topic of interactions. Typically at 24 months, autonomy is less than follow but follow is moderate in relation to mother directs and self-directed autonomy is greater than other-directed.

Compliant disengaged. The compliant disengaged child evidences little self-assertion or social autonomy directed toward the mother. There is an element of ignoring, although there is also a perceptual awareness or monitoring of her behavior. Assertions directed towards the mother are related to food and focus on gaining access. If the child does initiate a social interaction, it often occurs later in the snack and usually not more than once. There is an absense of active resistance or refusal, thus the child appears to readily follow maternal directives. The compliant child is distinguished by a lack of connectedness with the mother and passive following of her directives. Other directed autonomy, especially social other-directs, is low in relation to follows.

Active disengaged. The behavior pattern for this classification includes autonomy that is self-occupied in nature, excluding the mother rather than being asserted or expressed to her. Other-directed autonomy tends to be around requests or demands for food rather than initiations of other topics. In fact, the active disengaged child is not oriented to the mother and appears to have limited perceptual awareness or responsiveness to her; the child may be ignoring. Frequently, the child will evidence disengagement cues--looking way from the mother, turning away from her, or looking at the ceiling. Self-assertions may be made with intensity; protests, frustration, and refusals are common. Other autonomous activity will typically be self-occupied, e.g. playing with food, banging on the tray or table, running to other parts of the room, or making faces in the mirror. This child may eat as if alone. The few following behaviors are typically related to eating rather than to social conversation and convey resistance, sometimes with force.

Maternal Classifications

Maternal classifications were identified and developed on the basis of patterned behavior that reflected maternal engagement with her child and the nature of her directiveness. Maternal engagement, as with child engagement, was assessed in terms of the mother's perceptual awareness of and responsiveness to the child, including the child's developmental agenda. Directiveness was assessed not

only in terms of its frequency in relation to all maternal behavior but with respect to what proportion of the directs were autonomy facilitating vs. behavior controlling. The proportions of behavior were used to assist in assigning the classifications but only in the context of the child's behavior and in light of interactional nuances and characteristics.

Facilitative engaged. The facilitative engaged mother has nearly equivalent proportions of directs and follows, her directs tend to be facilitating for the child and follows tend to be facilitative of the child's self understandings. She is perceptually aware of and responsive to the child's cues and self-assertions, and responds with sensitive timing and pacing that facilitates further self-expression by the child. Her structure is similarly sensitive in pacing and timing, allowing for child self-assertions and choices, and is responsive to the child's agenda..

A distinguishing feature of the facilitative engaged mother is her attentiveness to the child's developmental agenda for autonomous self-expression and mutual engagement. These factors are central even if proportions are similar to the facilitate disengaged behavior pattern. This mother typically conveys a genuine interest in the child (vs. simply watching or witnessing the child eating). Maternal verbal followings extend and further develop child-initiated topics. She may "give words" to her interpretations of the child's behavior or the mother may give words to the thoughts and intentions underlying her behaviors.

Controlling engaged. The controlling engaged mother has a fairly balanced distribution of directs and follows and/or the proportion of verbal follows may exceed the child other-directed autonomy. Verbal follows tend to focus on the child's observable behavior as acknowledging follows rather than facilitative follows. Further, verbal directs may be largely autonomy-facilitating whereas behavioral/ nonverbal directs are likely to be behavior controlling. Verbal followings tend to comment on the child's behaviors regarding maternal directives (ie, maternal agenda).

A distinguishing feature is her perceptual awareness of and responsiveness to the child is

insensitive to the pacing and timing necessary to facilitate the child's autonomous self expression and insensitive to the child's disengagement cues. It seems that her lack of genuine interest in the child is manifested as a certain disengagement or a "functional engagement;" the purpose of engagement centers on the child's acceptance or compliance with maternal agenda. This contributes to the mother's missing the child's disengagement cues while trying to elicit child responses or behavior irrespective of the child's interest, topic, intention or agenda.

Facilitative disengaged. Mothers with this behavior pattern tend to have less direct than follow or fairly equivalent proportions of direct and follow, with predominantly facilitative directs and predominantly responding follows. This pattern is not behavior controlling. Notable, however, is the pervasive lack of a sense of connection evidenced by the mother with her child. In this pattern, the mother seems to be watching the child and "acting" the role of parent, rather than having an ongoing perceptual awareness of - or sensitivity to - the child's agenda developmental or otherwise. Although this mother structures the eating of the snack, her child may take the initiative for sustained social interaction. The mother may evidence limited empathic responsiveness to or capacity to take the perspective of the child, rarely expressing her interpretations of child behaviors or the thoughts underlying her own behaviors. Thus, her responsiveness is evident primarily in relation to the overt or blatant autonomous cues and distress signals. Even with a positive affect then, the mother with this behavior pattern convey little genuine interest or enjoyment in the interaction with her child.

Controlling disengaged. This pattern of maternal behavior has a higher proportion of directs than follows. The directs may be evenly distributed between autonomy-facilitating and behavior controlling although most mothers of this behavior pattern will be behavior controlling in nature. The disengagement from the child is usually evidenced by a scarcity of following behavior. Regardless of the child's efforts to engage her, the mother seems unaware of the child's cues, behaviors, activity, or needs and may seem self-occupied. Thus, her behavior is not responsive to the child but reflects her own

agenda. Behaviorally, the mother's actions concerning food will over-ride or ignore the child's cues, including attempts to reach for food. However (at 24 months), if the mother does seem to "attend to the child" and respond to the child's cues, it is with the sense of watching or witnessing the child eat or with a sense of superficiality, rather than with a genuine interest in relating to the child.

MUTUALITY

The mutuality rating is intended to provide an assessment of the quality of social cooperation and negotiation of eating. The quality refers to how well each partner in the interaction responds to the other's behavioral cues in an adaptive, synchronous and reciprocal manner. The rating reflects the extent to which the goals around eating are negotiated, so that individual agendas are expressed, acknowledged, and followed. The rating is meant to reflect Sander's (1977) notion of mutual adaptivity and responsiveness as the "fitting together of the active tendencies" of each member of the dyad.

A rating of **1** is **poor,** reflecting low mutuality. The dyad shows little awareness of each other's agenda, with minimal negotiation, shared goals or emotional/social connectedness. Eating activities may become the basis of conflict. There is a pervasive sense of disconnection throughout the eating episode.

A rating of **2** reflects a **some** mutuality. Although there are a moderate level of cooperation and some negotiation, there are also occasions in which the other's agenda is not acknowledged or joint goals are not negotiated. There is an imbalance in responsiveness, with one partner initiating or following the majority of interactions. In general, eating activities are in the foreground and reflect a tone of cooperation, but with some emotional or social disconnection.

Dyadic mutuality is rated as a **3**, indicating a predominantly engaged dyad in which agendas are shared, negotiated and followed. The interactions are balanced in that both partners assert and follow. Eating activities are often in the background and social interactions in the foreground. Thus, eating becomes a context for engagement rather than the focus of the interaction.

AFFECT

This third part of the coding scheme is an assessment of affect for the mother and the child. A three-point rating scale was designed to reflect the overt behavior related to or arising from feeling toward the partner during the snack interaction. The mother and child are rated separately for the predominantly affective tone of the episode. The ratings were defined as follows:

Negative (1) — The overall tone is negative or sober and outweighs instances of positive affect. Negative affect is as subdued, flat, or sober, with rare animation. Conversely, negative affect may reflect anger, sadness, irritability, resistance, and/or negativity directed toward the partner.

Neutral (2) — An absence of a clear, overall or dominant polarized affect; clearly neutral as defined by positive or negative affect. Negative and positive qualitites are observe red in the manifest affect, leaving uncertainty re: truly positive or truly negative affect.

Positive (3) — Overall, the actor appears comfortable and content, or to be enjoying the interaction. A positive polarized affect is reflected in behavior, such as voice tone, facial expressions and verbal 0expressiveness. The episode is a pleasant one even if there are instances of sternness or instruction.

Snack Scale

MATERNAL CHILD PROFILES

Subject #_____
Age_____
Coder_____

CHILD	AUTOMONY		FOLLOW	
	Self-directed	Other-directed social resistance	social	food/other
MOTHER	DIRECTS		FOLLOW	
	Facilitating	Controlling	Verbal	Behavioral

Child Classifications		Maternal Classifications	
Engaged - assertive	❐	Facilitative engaged	❐
Intermittently engaged	❐	Controlling engaged	❐
Compliant disengaged	❐	Superficial	❐
Active disengaged	❐	Controlling disengaged	❐

mutuality	1	2	3
c affect	1	2	3
m affect	1	2	3

Comments and notes:

Houck and Spegman, 1997

Appendix B

Control Autonomy Balance Scale

CONTROL-AUTONOMY BALANCE SCALES

Subject Number _____
Age _____
Taping Date _____
Coding Date _____
Coder _____

COUNTS

Child Autonomy	Child Follow	Mother Direct	Mother Follow
Self-directed			
Other-directed			

CHILD

Engaged-nonautonomous	☐
Engaged-autonomous	☐
Avoidant-compliant	☐
Ignoring	☐

MOTHER

Sensitive-nondirective	☐
Sensitive-directive	☐
Control directive	☐
Intrusive	☐

DYADIC FIT:	1	2	3
CHILD AFFECT:	1	2	3
MOM AFFECT:	1	2	3

COMMENTS AND NOTES:

Booth & Houck, 9/10/93

Appendix C

Nursing Child Assessment Teaching Scale

NCAST TEACHING SCALE

Birth to Three Years Only

Information applies to parent only
Mother's Ethnic Heritage (See back page)
Marital/Partner Status ☐ Married ☐ Single

Person Observed ____ Age ____ Educ.
☐ Mother ☐ Father
☐ Other ____
Major Caregiver ☐ Yes ☐ No
Name of Task ____
Length of Time Teaching (minutes)
1 or Less 2 3 4 5 6 or More

Setting
☐ Home
☐ Clinic
☐ Other ____
Were Others Present?
☐ Yes
☐ No
If yes, specify ____

Child's Name ____
Child's Age (in months) ____
Child's Sex ____
Child's Birth Order (circle)
1 2 3 4 5 or More
Child's State at Beginning of Teaching (circle)
Quiet Sleep Active Sleep Drowsy
Quiet Alert Active Alert Crying

I. SENSITIVITY TO CUES

	YES	NO
1. Caregiver positions child so child is safely supported.		
2. Caregiver positions child so that child can reach and handle teaching materials.		
3. Caregiver gets the child's attention before beginning the task, at the start of the teaching interaction.		
4. Caregiver gives instruction only when child is attentive (90% of the time).		
5. Caregiver allows child to explore the task material for at least five seconds before giving the first task related instruction.		
6. Caregiver positions child so that it is possible for them to have eye-to-eye contact with one another during the majority of the teaching episode (60%).		
7. Caregiver pauses when the child initiates behaviors during the teaching episode.		
8. Caregiver praises child's successes or partial successes.		
9. Caregiver asks for no more than three performances when child is successful at completing the task.		
10. Caregiver changes position of child and/or materials after unsuccessful attempt by the child to do the task.		
11. Caregiver avoids physically forcing the child to complete the task.		
TOTAL YES ANSWERS		

II. RESPONSE TO CHILD'S DISTRESS

☐ Yes ☐ No (Potent disengagement cues observed)

12. Caregiver stops the teaching episode.		
13. Caregiver makes positive, sympathetic, or soothing verbalization.		
14. Caregiver changes voice volume to softer or higher pitch, does not yell.		
15. Caregiver rearranges the child's position and/or task materials.		
16. Caregiver makes soothing non-verbal response, e.g. pat, touch, rock, caress, kiss.		
17. Caregiver diverts the child's attention by playing games, introduces a new toy.		
18. Caregiver avoids making negative comments to the child.		
19. Caregiver avoids yelling at the child.		
20. Caregiver avoids using abrupt movements or rough handling.		
21. Caregiver avoids slapping, hitting or spanking.		
22. Caregiver avoids making negative comments to home visitor about the child.		
TOTAL YES ANSWERS		

III. SOCIAL-EMOTIONAL GROWTH FOSTERING

23. Caregiver's body posture is relaxed during the teaching episode (90%).		
24. Caregiver positions self face-to-face with the child during the teaching interaction (60%).		
25. Caregiver laughs or smiles at child during the teaching interaction.		
26. Caregiver gently pats, caresses, strokes, hugs, or kisses child during episode.		
27. Caregiver smiles, or touches child within five seconds after the child smiles or vocalizes.		
28. Caregiver praises child's efforts or behaviors broadly (in general) at least once during the episode.		
29. Caregiver makes cheerleading type statements to the child during the teaching interaction.		
30. Caregiver avoids vocalizing to the child at the same time the child is vocalizing.		
31. Caregiver avoids making general negative or uncomplimentary remarks about the child.		
32. Caregiver avoids yelling at the child during the episode.		
33. Caregiver avoids making critical or negative comments about the child's task performance.		
TOTAL YES ANSWERS		

IV. COGNITIVE GROWTH FOSTERING

34. Caregiver provides an immediate environment which is free from distractions from animate sources (sibs, pets, other people, T.V.).		
35. Caregiver focuses attention and child's attention on the task during most of the teaching (60%).		
36. After caregiver gives instructions, at least five seconds is allowed for the child to attempt the task before caregiver intervenes again.		
37. Caregiver allows non-task manipulation of the task materials after the original presentation.		
38. Caregiver describes perceptual qualities of the task materials to the child.		
39. Caregiver uses at least two different sentences or phrases to describe the task to the child.		
40. Caregiver uses explanatory verbal style more than imperative style in teaching the child.		
41. Caregiver's directions are stated in clear, unambiguous language (i.e. ambiguous = "turn"; unambiguous = "turn the knob toward me").		
42. Caregiver uses both verbal description and modeling simultaneously in teaching any part of the task.		
43. Caregiver encourages and/or allows the child to perform the task at least once before intruding in on the use of the task materials.		
44. Caregiver verbally praises child after child has performed better or more successfully than the last attempt.		
45. Caregiver smiles and/or nods at the child after child performs better or more successfully than the last attempt.		
46. Caregiver responds to the child's vocalizations with a verbal response.		
47. Caregiver uses both verbal and non-verbal instruction in teaching the child.		
48. Caregiver uses the teaching loop at least once.		
49. Caregiver signals completion of task to child verbally or nonverbally.		
50. Caregiver spends no more than five minutes and not less than one minute in teaching the child the task.		
TOTAL YES ANSWERS		

V. CLARITY OF CUES

	YES	NO
51. Child is awake.		
52. Child widens eyes and/or shows postural attention to task situation.		
53. Child changes intensity or amount of motor activity when task material is presented.		
54. Child's movements are clearly directed toward the task or task material or away from the task material (not diffuse).		
55. Child makes clearly recognizable arm movements during the teaching episode (clapping, reaching, waving, pounding, pointing, pushing away).		
56. Child vocalizes while looking at the task materials.		
57. Child smiles or laughs during the episode.		
58. Child grimaces or frowns during the teaching episode.		
59. Child displays potent disengagement cues during the teaching interaction.		
60. Child displays subtle disengagement cues during the teaching interaction.		
TOTAL YES ANSWERS		

VI. RESPONSIVENESS TO CAREGIVER

61. Child gazes at caregiver's face or task materials after the caregiver has shown verbal or non-verbal alerting behavior.		
62. Child attempts to engage caregiver in eye-to-eye contact.		
63. The child looks at the caregiver's face or eyes when caregiver attempts to establish eye-to-eye contact.		
64. Child vocalizes or babbles within five seconds after caregiver's verbalization.		
65. Child vocalizes or babbles within five seconds after caregiver's gesturing, touching or changing his/her facial expression.		
66. Child smiles at caregiver within five seconds after caregiver's verbalization.		
67. Child smiles at caregiver within five seconds after caregiver's gesture, touch, or facial expression changes.		
68. When caregiver moves closer than eight inches from the child's face the child shows some subtle and/or potent disengagement cues.		
69. Child shows subtle and/or potent disengagement cues within five seconds after caregiver changes facial expression or body movement.		
70. Child shows subtle and/or potent disengagement cues within five seconds after caregiver's verbalization.		
71. Child shows potent and/or subtle disengagement cues when caregiver attempts to intrude physically in the child's use of the task materials.		
72. Child physically resists or responds aggressively when caregiver attempts to intrude physically in child's use of the task materials.		
73. The child stops displaying potent disengagement cues within 15 seconds after caregiver's soothing attempts.		
TOTAL YES ANSWERS		

To use this scale for research or clinical practice requires training. For more information write or call:

NCAST Programs
University of Washington
Box 357920
Seattle, WA 98195-7920
Phone (206) 543-8528 FAX (206) 685-3284

Enter the total yes answers from each subscale and compare it with the possible score:

	SUBSCALE Items Possible	SUBSCALE Items Actual	CONTINGENCY Items Possible	CONTINGENCY Items Actual
SENSITIVITY TO CUES	11		5	
RESPONSE TO DISTRESS	11		6	
SOCIAL-EMOTIONAL GROWTH FOSTERING	11		9	
COGNITIVE GROWTH FOSTERING	17		6	
CAREGIVER TOTAL	50		20	
CLARITY OF CUES	10		0	
RESPONSIVENESS TO CAREGIVER	13		12	
CHILD TOTAL	23		12	
CAREGIVER/CHILD TOTAL	73		32	

Check the Potent Disengagement Cues (PDC's) observed during the teaching interaction (excluding PDC's that terminate the teaching or occur after the caregiver has terminated the teaching).

___ Back arching
___ Choking
___ Coughing
___ Crawling away
___ Cry face
___ Crying
___ Fussing
___ Half hand
___ Lateral head shake
___ Maximal lateral gaze aversion
___ Overhand beating movements
___ Pale/red skin
___ Pulling away
___ Pushing away
___ Saying "no"
___ Spitting
___ Spitting up
___ Tray pound
___ Vomiting
___ Walking Away
___ Whining
___ Withdraw from alert to sleep state

Ethnic Heritage. Place a checkmark next to the mother's ethnic heritage and write in her specific group identity.

___ African-American
___ Asian Indian or A.I.- American
___ Chinese or Chinese-American
___ Filipino or Filipino-American
___ Japanese or Japanese-American
___ Korean or Korean-American
___ Pacific Islander or P.I.- American
___ Vietnamese or Vietnamese-American
___ Other Asian
___ Cuban or Cuban-American
___ Mexican, Chicano, or Mex. American
___ Puerto Rican
___ Other Hispanic/Latin
___ Native American or Alaskan Native
___ White/Caucasian (non-Hispanic)
___ Other

Specific group identity: _____

Clinical Notes:

Date of Observation _____

Recorder's Signature _____

Appendix D

Toddler Temperament Scale

Subject #_____
Child's Age _____

TODDLER TEMPERAMENT SCALE

For 36 month old children

BY

William Fullard, PhD., Sean C. McDevitt, PhD., and William B. Carey, MD.

RATING INFORMATION

1. Please base your rating on the child's recent and current behavior (the last four to six weeks).
2. Consider only your own impressions and observations of the child.
3. Rate each question independently. Do not purposely attempt to present a consistent picture of the child.
4. Use extreme ratings where appropriate. Avoid rating only near the middle of the scale.
5. Rate each item quickly. If you cannot decide, skip the item and come back to it later.
6. Rate every item. Circle the number of any item that you are unable to answer due to lack of information or any item that does not apply to your child.

Subject #_____
Child's Age _____

TODDLER TEMPERAMENT SCALE

For 36 month old children

BY

William Fullard, PhD., Sean C. McDevitt, PhD., and William B. Carey, MD.

RATING INFORMATION

1. Please base your rating on the child's recent and current behavior (the last four to six weeks).
2. Consider only your own impressions and observations of the child.
3. Rate each question independently. Do not purposely attempt to present a consistent picture of the child.
4. Use extreme ratings where appropriate. Avoid rating only near the middle of the scale.
5. Rate each item quickly. If you cannot decide, skip the item and come back to it later.
6. Rate every item. Circle the number of any item that you are unable to answer due to lack of information or any item that does not apply to your child.

TODDLER TEMPERAMENT

Using the following scale, please circle the number that indicates how often the child's recent and current behavior has been like that described by each item.

	Almost Never	Rarely	Variable Usually Does Not	Variable Usually Does	Frequently	Almost Always
1. The child gets sleepy at about the same time each evening *(within 1/2 hour)*.	1	2	3	4	5	6
2. The child fidgets during quiet activities *(story telling, looking at pictures)*.	1	2	3	4	5	6
3. The child takes feedings quietly with mild expression of likes and dislikes.	1	2	3	4	5	6
4. The child is pleasant *(smiles, laughs)* when first arriving in unfamiliar places.	1	2	3	4	5	6
5. The child's initial reaction to seeing the doctor is acceptance.	1	2	3	4	5	6
6. The child pays attention to game with parent for only a minute of so.	1	2	3	4	5	6
7. The child's bowel movements come at different times from day to day *(over one hour difference)*.	1	2	3	4	5	6
8. The child is fussy on waking up *(frowns, complains, cries)*.	1	2	3	4	5	6
9. The child's initial reaction to a new baby sitter is rejection *(crying, clinging to mother, etc.)*.	1	2	3	4	5	6
10. The child reacts to a disliked food even if it is mixed with a preferred one.	1	2	3	4	5	6
11. The child accepts delays *(for several minutes)* for desired objects or activities *(snacks, treats, gifts)*.	1	2	3	4	5	6
12. The child moves little *(stays still)* when being dressed.	1	2	3	4	5	6
13. The child continues an activity in spite of noises in the same room.	1	2	3	4	5	6
14. The child shows strong reactions *(cries, stamps feet)* to failure.	1	2	3	4	5	6
15. The child plays continuously for more than 10 minutes at a time with a favorite toy.	1	2	3	4	5	6

TODDLER TEMPERAMENT

Using the following scale, please circle the number that indicates how often the infant's recent and current behavior has been like that described by each item.

	Almost Never	Rarely	Variable Usually Does Not	Variable Usually Does	Frequently	Almost Always
16. The child ignores the temperature of food, whether hot or cold.	1	2	3	4	5	6
17. The child varies from day to day in wanting a bottle or snack before bedtime at night.	1	2	3	4	5	6
18. The child sits still while waiting for food.	1	2	3	4	5	6
19. The child is easily excited by praise *(laughs, yells, jumps)*.	1	2	3	4	5	6
20. The child cries after a fall or bump.	1	2	3	4	5	6
21. The child approaches and plays with unfamiliar pets *(small dogs, cats)*.	1	2	3	4	5	6
22. The child stops eating and looks up when a person walks by	1	2	3	4	5	6
23. The child seems unaware of differences in taste of familiar liquids *(type of milk, different juices)*.	1	2	3	4	5	6
24. The child moves about actively when he/she explores new places *(runs, climbs or jumps)*.	1	2	3	4	5	6
25. The child fusses or whines when bottom cleaned after bowel movement.	1	2	3	4	5	6
26. The child smiles when played with by unfamiliar adults.	1	2	3	4	5	6
27. The child looks up from play when mother enters the room.	1	2	3	4	5	6
28. The child spends over an hour reading a book or looking at the pictures.	1	2	3	4	5	6
29. The child responds intensely *(screams, yells)* to frustration	1	2	3	4	5	6
30. The child eats about the same amount of solid food at meals from day to day.	1	2	3	4	5	6

TODDLER TEMPERAMENT

Using the following scale, please circle the number that indicates how often the infant's recent and current behavior has been like that described by each item.

	Almost Never	Rarely	Variable Usually Does Not	Variable Usually Does	Frequently	Almost Always
31. The child remains pleasant when hungry and waiting for food to be prepared	1	2	3	4	5	6
32. The child allows face washing without protest *(squirming, turning away)*	1	2	3	4	5	6
33. The amount of milk or juice the child takes at mealtime is unpredictable from meal to meal *(over 2 oz. difference)*	1	2	3	4	5	6
34. The child practices physical activities *(climbing, jumping, pushing objects)* for under 5 minutes	1	2	3	4	5	6
35. The child vigorously resists additional food or milk when full *(spits out, clamps mouth closed, bats at spoon, etc.)*	1	2	3	4	5	6
36. The child plays actively *(bangs, throws, runs)* with toys indoors	1	2	3	4	5	6
37. The child ignores voices when playing with a favorite toy	1	2	3	4	5	6
38. The child approaches *(moves toward)* new visitors at home	1	2	3	4	5	6
39. The child plays outside on hot or cold days without seeming to notice differences in temperature	1	2	3	4	5	6
40. The child continues playing with other children for under five minutes and then goes elsewhere	1	2	3	4	5	6
41. The child continues to look at a picture book in spite of distracting noises *(car horns, doorbell)*	1	2	3	4	5	6
42. The child wants a snack at a different time each day *(over one hour difference)*	1	2	3	4	5	6
43. The child is pleasant *(smiles)* when put down for nap or at night	1	2	3	4	5	6
44. The child takes several days to get used to *(show usual behavior in)* new situations away from parent *(play group, day care center, sitter.)*	1	2	3	4	5	6
45. The child speaks *(or vocalizes)* right away to unfamiliar adults	1	2	3	4	5	6

TODDLER TEMPERAMENT

Using the following scale, please circle the number that indicates how often the infant's recent and current behavior has been like that described by each item.

	Almost Never	Rarely	Variable Usually Does Not	Variable Usually Does	Frequently	Almost Always
46. The child reacts strongly *(cries or screams)* when unable to complete a play activity	1	2	3	4	5	6
47. The child enjoys games with running and jumping over games done sitting down	1	2	3	4	5	6
48. The child notices wet clothing, and wants to be changed right away	1	2	3	4	5	6
49. The child is fussy or moody throughout a cold or an intestinal virus	1	2	3	4	5	6
50. The child ignores parent's first call while watching a favorite T.V. program	1	2	3	4	5	6
51. The child loses interest in a new toy or game within an hour	1	2	3	4	5	6
52. The child runs to get where he/she wants to go	1	2	3	4	5	6
53. For the first few minutes in a new place *(store, home or vacation place)* the child is wary *(clings to mother, holds back)*	1	2	3	4	5	6
54. The child takes daytime naps at differing times *(over 1/2 hour difference)* from day to day	1	2	3	4	5	6
55. The child reacts mildly *(frown or smile)* when his/her play is interrupted by parent	1	2	3	4	5	6
56. The child accepts being dressed and undressed without protest	1	2	3	4	5	6
57. The child is outgoing with adult strangers outside the home	1	2	3	4	5	6
58. The child runs ahead when walking with the parent	1	2	3	4	5	6
59. The child's period of greatest physical activity comes at the same time of day	1	2	3	4	5	6
60. The child can be coaxed out of a forbidden activity	1	2	3	4	5	6

TODDLER TEMPERAMENT

Using the following scale, please circle the number that indicates how often the infant's recent and current behavior has been like that described by each item.

	Almost Never	Rarely	Variable Usually Does Not	Variable Usually Does	Frequently	Almost Always
61. The child stops play and watches when someone walks by.	1	2	3	4	5	6
62. The child goes back to the same activity after brief interruption *(snack, trip to toilet)*	1	2	3	4	5	6
63. The child laughs or smiles when meeting other children	1	2	3	4	5	6
64. The child sits still while watching T.V. or listening to music	1	2	3	4	5	6
65. The child will avoid repetition of misbehavior if punished firmly once or twice	1	2	3	4	5	6
66. The child continues to play with a toy in spite of sudden noises from outdoors *(car horn, siren, etc.)*	1	2	3	4	5	6
67. The child ignores dirt on himself/herself	1	2	3	4	5	6
68. The child's time of waking in the morning varies greatly *(by 1 hours or more)* from day to day.	1	2	3	4	5	6
69. The child has moody or "off" days when he/she is fussy all day.	1	2	3	4	5	6
70. The child reacts mildly *(frowns or smiles)* when another child takes his/her toy	1	2	3	4	5	6
71. The child stays with a routine task *(dressing, picking up toys)* for 5 minutes or more.	1	2	3	4	5	6
72. The child stops eating and looks when he/she hears an unusual noise *(telephone, doorbell)*.	1	2	3	4	5	6
73. The child sits still *(moves little)* during procedures like hair brushing or nail cutting.	1	2	3	4	5	6
74. The child shows much bodily movement *(stomps, writhes, swings arms)* when upset or crying	1	2	3	4	5	6
75. The child is pleasant *(smiles, laughs)* during face washing	1	2	3	4	5	6

TODDLER TEMPERAMENT

Using the following scale, please circle the number that indicates how often the infant's recent and current behavior has been like that described by each item.

	Almost Never	Rarely	Variable Usually Does Not	Variable Usually Does	Frequently	Almost Always
76. The child's initial reaction at home to approach by strangers is acceptance *(looks at, reaches out)*.	1	2	3	4	5	6
77. The child is hungry at dinner time.	1	2	3	4	5	6
78. The child continues to get into forbidden areas or objects in spite of parents' repeated warnings.	1	2	3	4	5	6
79. The child stops to examine new objects thoroughly *(5 minutes or more)*.	1	2	3	4	5	6
80. The child ignores odors *(cooking, smoke, perfume)* whether pleasant or not.	1	2	3	4	5	6
81. The child looks up from an activity when he/she hears the sounds of children playing.	1	2	3	4	5	6
82. The child falls asleep at about the same length of time after being put to bed.	1	2	3	4	5	6
83. The child greets babysitter loudly with much expression of feeling whether positive or negative.	1	2	3	4	5	6
84. The child is moody for more than a few minutes when corrected or disciplined.	1	2	3	4	5	6
85. The child sits still *(little squirming)* when traveling in car or stroller	1	2	3	4	5	6
86. The child watches T.V. for under 10 minutes, then turns to another activity.	1	2	3	4	5	6
87. The child is shy *(turns away or clings to mother)* on meeting another child for the first time.	1	2	3	4	5	6
88. The child is still wary of strangers after 15 minutes.	1	2	3	4	5	6
89. The child frets or cries when first learning a new task *(dressing self, picking up toys)*.	1	2	3	4	5	6
90. The child sits quietly in the bath.	1	2	3	4	5	6

TODDLER TEMPERAMENT

Using the following scale, please circle the number that indicates how often the infant's recent and current behavior has been like that described by each item.

	Almost Never	Rarely	Variable Usually Does Not	Variable Usually Does	Frequently	Almost Always
91. The child practices a new skill *(throwing, piling, drawing)* for 10 minutes or more.	1	2	3	4	5	6
92. The child ignores differences in taste or consistency of familiar foods.	1	2	3	4	5	6
93. The child sleeps poorly *(restless, wakeful)* in new places for first 2 or 3 times.	1	2	3	4	5	6
94. The child is fearful of being put down in an unfamiliar place *(supermarket cart, new stroller, playpen)* with parent present	1	2	3	4	5	6
95. The child frowns or complains when left to play by self.	1	2	3	4	5	6
96. The child accepts within 10 minutes *(feels at home, at ease)* new surroundings *(home, store, play area)*.	1	2	3	4	5	6
97. The child looks up from play when the telephone or doorbell rings	1	2	3	4	5	6

Appendix E

Adaptive Social Behavior Inventoy

Subject #_____

THE ADAPTIVE SOCIAL BEHAVIOR INVENTORY

36 months

Please circle the number/response that best describes your child.

Rarely or Never	Sometimes	Almost Always	
1	2	3	1. Understands others' feelings, like when they are happy, sad or mad.
1	2	3	2. Is helpful to other children.
1	2	3	3. Is obedient and compliant.
1	2	3	4. When you give him/her an idea for playing, he/she frowns, shrugs shoulders, pouts or stamps foot.
1	2	3	5. Follows rules in games.
1	2	3	6. Gets upset when you don't pay enough attention.
1	2	3	7. Is sympathetic toward other children's distress, tries to comfort others when they are upset.
1	2	3	8. Waits her/his turn in games or other activities.
1	2	3	9. Is open and direct about what he/she wants.
1	2	3	10. Cooperates with your requests.
1	2	3	11. Can easily get other children to pay attention to him/her.
1	2	3	12. Says nice or friendly things to others.
1	2	3	13. Will join a group of children playing.
1	2	3	14. In social activities, tends to just watch others.
1	2	3	15. Follows household or family rules.
1	2	3	16. Says "please" and "thank you" when reminded.
1	2	3	17. Asks or wants to go play with other children.
1	2	3	18. Is calm and easy-going.
1	2	3	19. Plays games and talks with other children.
1	2	3	20. Shares toys or possessions.
1	2	3	21. Teases other children, calls them names.
1	2	3	22. Is confident with other people.
1	2	3	23. Prevents other children from carrying out routines.
1	2	3	24. Tends to be proud of things she/he does.
1	2	3	25. Accepts changes without fighting against them or becoming upset.
1	2	3	26. Bullies other children.
1	2	3	27. Is interested in many and different things.
1	2	3	28. Is worried about not getting enough.
1	2	3	29. Is bossy, needs to have his/her way.
1	2	3	30. Enjoys talking with you.