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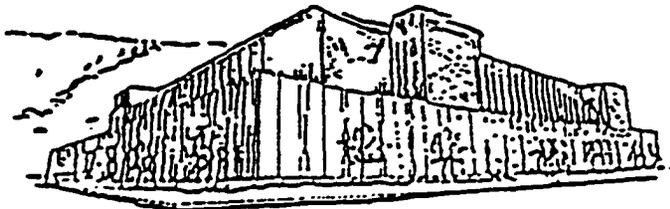
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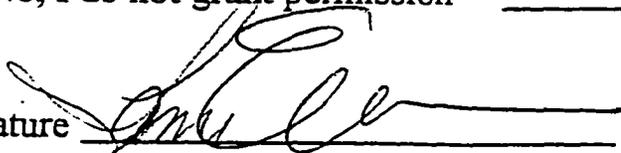
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Effects of Respectful Parenting in Early Childhood on Young Adults' Attachment Style and Approach to Information Processing: Implications for Latent Inhibition, Contingency Perception and Behavioral Adjustment

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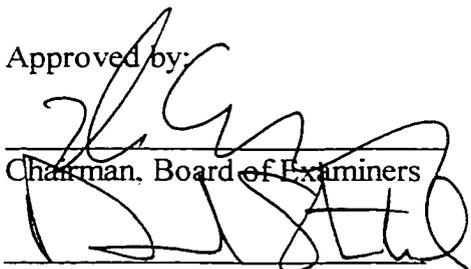
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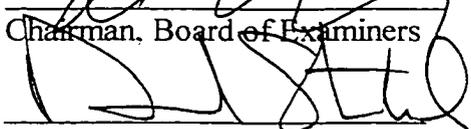
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1999

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Effects of Respectful Parenting in Early Childhood on Young Adults' Attachment Style and Approach to Information-Processing: Implications for Latent Inhibition, Contingency Perception, and Behavioral Adjustment

Director: David Schuldberg, Ph.D.



This study examines whether a high level of parental “respect” toward children, retrospectively assessed through the self-reports of young adult subjects, is associated with attachment security and other positive outcomes in the subjects’ functioning. It is predicted that individuals who have experienced higher levels of respect, operationalized as reports of predominantly having been parented in an authoritative manner and self-endorsements of secure attachment, will exhibit differences in their responses to tests of Latent inhibition and Contingency Perception that are consistent with a more efficient style of information processing, as compared with subjects who reported being reared in a parental environment characterized by lower levels of respect. In addition, subjects who report having experienced high parental respect are predicted to report a more self-controlled, internally-driven pattern of interaction with the environment that suggests generally more positive behavioral adjustment. A theory regarding the possible etiology of the hypothesized differences in developmental outcomes is proposed, incorporating sociobiological, behavioral, and psychodynamic principles.

The study yields evidence that parenting style and attachment security may indeed be influential in shaping aspects of attention, information-processing and behavioral adjustment. Significant differences in Latent Inhibition as a function of Parenting/ Attachment group membership do not emerge, but there are indications that individuals who report having been reared in a lower respect parenting environment may be more hypervigilant to novel stimuli; these individuals also report significantly more symptoms of Adult ADHD. A post-hoc Analysis of Variance based on an alternative split of the sample shows classic LI deficiencies in individuals reporting high levels of ADHD symptoms, as compared with individuals reporting low levels of symptoms. This supports the link between LI and behavioral manifestations of attentional processes. Implications of this research for better understanding the influence of environmental factors on attentional dysfunction and behavioral maladjustment are considered.

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CHAPTER 1: INTRODUCTION

Effects of Respectful Parenting in Early Childhood

on Young Adults' Attachment Style and Approach to Information Processing:
Implications for Latent Inhibition, Contingency Perception and Behavioral Adjustment

Parental Respect for Children

The current paper defines “parental respect” as a parent’s consistent application of clear and developmentally appropriate limits, within a broader context of predominantly positive reinforcement and a warm, accepting affective tone. While “respectful” parents ensure their child’s safety and consistent care, they also allow for increasing levels of appropriate autonomy as he or she develops. Important components of parental respect, as defined in the present paper, include sensitive and contingent responsiveness, consistency and clarity in limit-setting, unconditional positive regard, nonintrusiveness, and containment. In this framework, containment refers to the parents’ ability to respond empathically to the child’s strong emotional expressions without compromising the integrity of their own parental boundaries.

Respect from parent to child allows the child to be sufficiently open to experience in trusted social contexts for the experience of emotional synchrony to occur (Watson, 1979). This allows the infant to align his or her emotions with trusted others, facilitating identity formation and encouraging the development of empathy, perspective-taking, and other critical social skills. Through emotional synchrony with significant caretakers the infant also learns to identify those aspects of the intricately complex array of stimuli in the surrounding environment that deserve preferential attention.

The current study examines possible developmental consequences of parental respect for children by examining authoritative parenting, a construct that closely captures the qualities of parenting just described (Baumrind, 1967; Baumrind, 1971; Steinberg, Lamborn, Darling, Mounts & Dornbusch, 1994). “Respectful” parenting may be particularly important as a means to confer resiliency-enhancing attributes on a child who may be compromised by one or more developmental risk factors (e.g., Krener & Cranston, 1990). Further, this paper argues that throughout the lifespan the developmental consequences of the interpersonal stance most commonly called “respect” offer individuals resistance to both psychosocial stressors and temperamental factors that may weaken their ability to maintain psychological integrity.

In addition, in the earliest social interactions parental respect may be essential for the intact development of the infant brain, facilitating sound strategies for information processing, interaction with the environment, and emotional regulation. The current proposal asserts that early social contingencies also have a significant impact on the development of healthy interpersonal boundaries. These boundaries allow for an increasingly clear “me” versus “not me” distinction across development and a concurrent capacity for healthy intimacy. Inadequate boundary development may have a decisive impact on judgements of contingency, overall behavioral effectiveness, and psychological health.

Although “respect” may be considered a value-laden term, its use in the current

context is not intended to convey value judgement. Instead, the term “respect” was chosen because it captures essential qualities of the parental approach that most effectively foster sound parent-child interactions. In a global sense, parental respect is a stance that is attentive to each of the unique contours of the child’s developing self. The respectful parent provides a positive, nurturing response to the child’s overtures. The parent tries not to interfere with the child’s expression and exploration, except as necessary to provide consistent care, to set clear, firm, and healthy limits, and to ensure safety.

Numerous variables may negatively impact a parent-child relationship to reduce these qualities of interaction. Many of these factors are under limited or no parental control. Examples include high levels of psychosocial stress (with or without low socioeconomic status), difficult infant temperament, parental psychopathology (including severe depression and psychosis), parental cognitive impairment, and parent rearing history.

Attachment

Attachment patterns are stable social interaction strategies that arise in human infancy in response to primary caregivers. Researchers have focused considerable attention on attachment schemes as they develop early in life, and as they progress through childhood, adolescence and adulthood (e.g., Cowan, Cowan, Cohn & Pearson, 1996; Fonagy et al., 1996; Jones, 1996; Lyons-Ruth, 1996; Toth & Cichetti, 1996; Van IJzendoorn & Bakermans-Kranenburg, 1996; Zeanah, 1996), including investigations into

the parental behaviors that are most commonly associated with various attachment patterns (e.g., Fagot, 1997). The parental approach that is most often associated both empirically and anecdotally with attachment security is authoritative parenting (Radziszewska, Richardson, Dent & Flay, 1996).

Researchers have identified attachment variables as a potentially important risk and resiliency factor relevant to many psychological disorders (Black, Hutcheson, Dubowitz, Berenson-Howard, 1994; Fonagy, Leigh, Steele, Mattoon, Target & Gerber, 1996; Toth & Cicchetti, 1996). Disrupted attachment in childhood is positively correlated with subsequent behavior problems (Easterbrooks, Davidson, & Chazan, 1993; Greenberg, Speltz & DeKlyen, 1993; Lyons-Ruth, 1996; Moretti, Holland & Peterson, 1994; Waters, Posada, Crowell, & Lay, 1993), including substance abuse (Cohen & Rice, 1997; Jackson, Bee-Gates & Henriksen, 1994; Weiss & Schwartz, 1996).

Attention and Information-Processing

There is increasing evidence that information-processing strengths and anomalies may be environmentally mediated by factors such as level and quality of stimulation (e.g., Smith, Landry, Swant, Baldwin, Denson & Wilden, 1996), variables that are intricately associated with parenting style. Attentional and information-processing dysfunction is observed in association with many psychological disorders, ranging from schizophrenia (Ellenbroek, Geyer & Cools, 1995) to Attention-Deficit Hyperactivity Disorder (ADHD) and is also associated with disruptive behavior problems (Guevremont & Dumas, 1994).

The exceedingly broad and difficult to measure construct of attention has been described aptly as “at once both intuitive and elusive” (Mangun & Hillyard, 1990). Introspectionist William James viewed attention as a means to explain how the mind focused on one sensation or train of thought to make sense of the “booming, buzzing confusion” of stimuli that he believed must barrage an infant in whom this ability has not yet developed. Presumably, in the course of development, an infant becomes increasingly able to filter and extract salient stimuli from the environment by means of the perceptual apparatus. He or she learns to interact systematically with these stimuli, which have inherent or acquired significance through innate or learned processes. If this ability did not develop properly, it is not difficult to imagine the behavioral disruption that would ensue. As mentioned above, such disruption is evident in most psychopathological conditions associated with attentional dysfunction.

Because the concept of attention has limited conceptual and empirical utility, researchers are faced with defining specific component processes, along with finding valid and reliable means of measuring them. The present research will attempt to address the definitional ambiguity and associated difficulties in assessing attention by examining two relatively well operationalized constructs that appear to be associated with attention and information-processing abilities: Latent Inhibition and Contingency Perception. The central construct in this work is Latent Inhibition, and it is discussed next. Contingency Perception will be discussed later.

Latent Inhibition

Latent Inhibition (LI) is a robust behavioral phenomenon, reliably demonstrated in a variety of species, including humans, that may help clarify the mire of definitions and abstractions associated with attentional processes. Lubow and Moore (1959) developed the notion of LI to describe what happens when a stimulus is presented repeatedly to a subject without being associated with a consequence. Specifically, if LI is intact, over time a repeatedly inconsequential stimulus enters into new associations more slowly than a novel stimulus would.

LI has been described as an information processing component that is crucial to integrating current learning with past regularities of experience (Bullen, Hemsley & Dixon, 1987; Gray, 1995). It is not surprising that this phenomenon has been shown across a variety of species, as it presumably confers an evolutionary advantage (Lubow, 1989), at least in certain circumstances, such as would exist in a reasonably stable environment.

By not allocating undue attention to inconsequential stimuli, organisms may be better able to focus on salient aspects of their environment. As a result, they are probably able to interact more systematically with the environment and to profit from the regularities displayed through previous stimulus-consequence associations. If this ability were impaired or absent, inconsequential aspects of the environment theoretically would remain important, resulting in unsystematic, maladaptive, and to the observer, sometimes bizarre behavior. Possible examples are the positive symptoms of schizophrenia or the

extreme impulsivity of a child with ADHD.

Deficits in LI have been identified in individuals in the acute stages of schizophrenia (Baruch, Hemsley, & Gray, 1988; Gray, Hemsley, & Gray, 1992), in individuals high on the continua of schizotypal traits, (Baruch, Hemsley, & Gray, 1988b; Lipp & Vaitl, 1992; Lubow, Ingberg-Sachs, Zalstein-Orda, & Gewirtz, 1992) and in children with ADHD (Lubow & Josman, 1993). LI provides promise of unraveling the mystery of debilitating disorders of which a core feature is attentional disruption, including schizophrenia (Solomon et al., 1981; Weiner, Lubow & Feldon, 1988) and ADHD (Lubow & Josman, 1993).

Some deficiency in LI might be expected in creative individuals who are prone to divergent thinking, which relies to some extent on processing aspects of the environment that previously have not been identified as important (Eysenck, 1995), because this group is perhaps “overly” attuned to subtle variations in stimuli and sensitive to slight increments of novelty. This processing strategy may have advantages to an individual living in an unpredictable environment. At the other extreme, if previously inconsequential stimuli were not processed at all, an organism conceivably could become too constricted in its thought processes and behavioral repertoire and overly habituated to the environment, thus might become less able to adapt to sudden, unexpected changes in environmental contingencies. This suggests a curvilinear relationship between the level of LI and adjustment. In the present work, deficits in LI are considered a sign of attentional

dysfunction.

Parental Respect as a Possible Resiliency Factor

Researchers are placing increasing emphasis on identifying the precursors of psychopathological conditions to design more effective interventions to prevent or address them. In the realm of developmental psychopathology, the origins and progression of psychological disorders, along with risk and resiliency factors that play causal roles in their expression, are receiving increasing scrutiny. The current proposal will join in those efforts by describing empirical evidence that may link early psychosocial experiences related to parental respect, as previously defined, including early physical and psychological isolation from key caregivers, to the development of alterations in LI and Contingency Perception, skills that may be associated with the efficiency of information processing. It then proposes gathering further data that will potentially provide evidence of a relationship between certain experiences in the early rearing environment and differences in aspects of information processing and behavioral adjustment in adulthood.

A preliminary theory regarding one route to the development of social and cognitive maladjustment will be presented, incorporating behavioral, object relations, cognitive, attachment and ethological constructs. Critical theory and research in each of these areas will be discussed and finally integrated into the theoretical rationale for the current study. Relevant research concerning LI, Attachment and Contingency Perception will be described. Studies examining the impact of environmental adversity, including the effects

of environmental contingency patterns and psychosocial stress, on children's behavioral adjustment and psychological health also will be reviewed.

In addition to providing an overview of relevant theory and research regarding each of the constructs that are central to the current study, this paper will also discuss theoretical and empirical support for connections between these constructs. Research examining the association between disrupted LI and schizophrenia, schizotypy, and ADHD will be described, along with data linking disrupted attachment to the development of behavior disorders and psychopathology. Evidence that early social contingencies are influential in both the prevention and development of behavioral and psychological anomalies will be discussed, followed by a brief description of possible sociobiological and neurobiological mechanisms associated with the proposed processes.

Due to the number and diversity of constructs discussed in this proposal, linking diagrams will be included throughout to help the reader follow the line of thought. Because of the breadth of research associated with each of these constructs, the review will be limited to those findings that are most relevant to the current discussion and the proposed study; Citations will be provided for sources where further research, less central to the current study, may be found.

The proposed study is based on the theory that early "respectful" treatment of a child by the parents predisposes the child to develop secure attachment strategies and information-processing abilities that are optimal for adjustment to a reasonably stable

environment. Based on previous research, the course of development and expression of LI and Contingency Perception are hypothesized to be influenced by early social experiences (e.g., Feldon & Weiner, 1991). The cumulative outgrowths of sound information-processing strategies, coupled with the other adaptive correlates of secure attachment, may combine to foster resilience in the child and to discourage the development of behavioral disorders and psychopathology.

Research Design

The current study employs an analogue design using young adult subjects. Two groups hypothesized to be characterized by high and low levels of early “respectful” treatment are established through prescreening assessments of subjects’ perceptions of how they were parented. Subjects’ self-assessed attachment security, which is proposed to be an outgrowth of respectful parenting also will be assessed. Specifically, a group high in perceived authoritative parenting, who also provide endorsements of secure attachment, and a group low in perceived authoritative parenting, who also provide endorsements of insecure attachment, are identified.

This study hardly discounts the contribution of genetic influences on behavioral adaptation; Instead, it highlights their potential impact as both genetic and environmental diatheses for the development of alterations in information processing and cognitive, emotional and behavioral adjustment. Parent-child interaction patterns that are disrupted due to a genetically transmitted psychopathological condition present in the parent, in the

child, or in both, would be one example of a genetically-based risk factor whose detrimental impact could be compounded by its effects on parent-child social interactions.

The major aim of the proposed study is to examine the possibly powerful contribution of high levels of “respect” conveyed to infants by their parents as a factor of resilience, which may both result in positive outcomes directly and mitigate against the expression of maladaptive predispositions. Figure 1, which follows, presents a description of the key variables in this study and their proposed relationships. In the sections that follow the table, a brief summary and overview of these constructs will be provided.

Figure 1

Key Constructs

Characteristics and Consequences of Infants' Early Environment	Information-Processing Attributes	Mode of Interaction With Environment	Behavioral Adjustment/ Psychopathology
Authoritative Parenting/ Attachment Security	Latent Inhibition Contingency Perception	Need for Contingency	Symptoms of Adult ADHD

Order of Presentation

In the sections that follow, the theoretical foundation for the present study will be laid through a review of pertinent data regarding the previously described constructs. The first construct examined will be attachment, due to data and theory which relate the security of attachment in childhood, adolescence, and adulthood to the quality of early interactions; the nature of early environmental contingencies are hypothesized to be a significant determinant of both the quality and developmental outgrowths of early social interactions. Research relevant to the association between attachment security and the variables included in the present study will be reviewed.

LI will be the next construct discussed, due to this paper's premise that alterations in the expression of LI may be an early precursor to the development of information-processing anomalies that theoretically predispose individuals to develop behavioral maladjustment and psychopathology, including ADHD. Some compelling findings regarding the possible developmental origins of LI will then be described, followed by research on the association between LI and schizophrenia, schizotypal traits, ADHD, and Obsessive-Compulsive Disorder.

A review of important theory and research regarding Contingency Perception will follow, based on the hypothesis that thresholds for accurate assessment of environmental contingencies are established early in childhood in response to some of the same environmental variables that may contribute to the development of deficits in LI. Research

regarding the behavioral and emotional correlates of these potentially significant environmental variables, specifically inconsistency, deficiency, or intrusiveness in early social interactions, along with other types of environmental adversity, also will be reviewed.

Finally, the extent to which recent research and the current study might contribute to identifying core elements for interventions focused on environmentally-mediated factors of risk and resilience for the development of psychological disorders will be discussed.

CHAPTER 2: PROPOSED DEVELOPMENTAL CORRELATES OF EARLY RESPECT

Attachment and Psychopathology

Attachment Theory

Attachment theory (Bowlby, 1982) has unified diverse theoretical perspectives, drawing concepts from psychoanalytic theory, developmental psychology, ethology, control systems theory, and cognitive science (Fonagy et al., 1996). Attachment, as defined by Bowlby (1982) and Ainsworth (1964), refers to a lasting affective bond present from early childhood, which is characterized by a tendency to seek and maintain proximity to a specific caretaker, especially under conditions of stress, when a child is in need of comfort and protection, such as when he or she is afraid, tired or ill. Elements of this bond persist into adulthood and throughout the lifespan.

Humans are biologically predisposed to form attachments, and, given a somewhat “normal” environment, nearly all humans will form an attachment to their primary caregiver. Bowlby has argued that humans’ striving for attachment is distinct from other classes of behavior and is as fundamental as the need for food and sex (Bowlby, 1958). Bowlby (1982) has proposed that the biological function of attachment behavior is protection. Throughout our evolutionary history the environment has posed many threats to the safety of humans, especially in the earliest and most vulnerable stages of development; thus, maintaining proximity to one’s primary caregiver is likely to have evolved as an effective means of protection from predation, hunger, and numerous other dangers, because it enhanced the probability that individuals of the species would survive

to reproduce.

As humans develop, behavior becomes organized into behavioral systems or sets of discrete behaviors that function together in a centrally organized way to help the individual achieve a goal (Colin, 1996). These systems are goal-corrected, meaning that they function in a flexible manner, adjusting as signaled by internal and external feedback. Bowlby (1982) proposed that attachment behavior is organized by means of a control system within the central nervous system, analogous to the physiological systems that regulate such functions as temperature and blood pressure. These systems maintain homeostasis, monitoring internal and external stimuli to set an appropriate goal, after which relevant behaviors are selected and executed; information is continuously collected regarding proximity to the goal so as to correct behavior accordingly and maximize the probability that the goal will be attained. The goal-corrected nature of the attachment system is evident in the behavior of a frightened child who cries in an effort to bring his mother to him, then crawls to her when she has not yet responded, then discontinues the behaviors when she is sufficiently near. In this situation fear would be thought of as an activator, “turning on” the attachment system, which mobilizes appropriate “goal-seeking” behaviors, while attaining closeness and sufficient physical contact with the caregiver generally will terminate the behavior; this is an example of “negative feedback” in the cybernetic sense. Activators can arise within the individual (e.g., illness) or may be external stimuli (e.g., a loud noise). Many times they are a combination of both, or may be

thought of from both perspectives. For example, encountering a large, barking dog is an external activator, associated with the internal activator of fear.

The attachment system interacts with other behavioral systems within the individual and with behavioral systems of others in his environment. Attachment theorists have acknowledged several relevant behavioral systems in addition to the feeding, reproductive and attachment systems, specifically exploration-play, affiliation, fear-wariness and caregiving (Colin, 1996). In the case of a child encountering a large dog, a situation that elicits fear and initiates attachment-based tendencies to seek out the mother, the fear-wariness system and the attachment system are closely interacting and serve to remove the child from danger to the proximity of the caregiver.

The close interaction between a baby's attachment system and the caregiving system of the parents is of particular importance, as indicated in the interplay of proximity-seeking infant behaviors that are reciprocated by physical and emotional nurturance provided by a "good-enough" mother (Winnicott, 1958). The concept of "good-enough" parenting from object relations theory is parallel to Ainsworth's concept of "sensitive responsiveness" on the part of the primary caregivers, which is thought to be the integral to the development of a secure attachment (See, e.g., Koester, 1995; MacTurk, Meadow-Orlans, Koester, & Spencer, 1993). The responsive caregiver may be the child's mother, father, or another significant nurturer. Sensitive responsiveness involves being attuned to the baby's signals, interpreting them accurately and responding promptly in an appropriate

manner.

In Winnicott's words:

The good enough 'mother' (not necessarily the infant's own mother) is one who makes active adaptation to the infant's needs, an active adaptation that gradually lessens, according to the infant's growing ability to account for failure of adaptation and to tolerate the results of frustration. Naturally, the infant's own mother is more likely to be good enough than some other person, since this active adaptation demands an easy and unresented preoccupation with the one infant; in fact, success in infant-care depends on the fact of devotion, not on cleverness or intellectual enlightenment.

Descriptions of naturalistic observation of the interplay of the child's signals and the parent's responses suggest that when it operates well, it is a delicate communicative dance, appearing finely choreographed. These are the interaction patterns that research suggests are likely to result in a secure attachment, which a growing number of studies are linking to positive social, emotional and cognitive development. Ainsworth, Blehar, Waters and Wall (1978) found a highly significant positive correlation between infants' secure attachment patterns and sensitive responsiveness on the part of mothers. Ainsworth (1983) found impaired sensitive responsiveness in mothers of anxiously attached infants. These mothers exhibited a level of interaction with their babies equal to that in the sensitively-responsive parent/ secure baby dyads, but it was not well orchestrated; that is, the pairs seemed to be out of synchrony with each other. The interactions were characterized as lacking the emotional harmony and ease of

communication that was evident in the sensitively responsive/ secure interactions. For example, mothers of anxiously attached children exhibited intrusive interactions that were not solicited during periods exploration and failed to respond to cries for contact.

Similar patterns of maternal responsiveness have been found across different cultures. In general, mothers have been found to respond to their infants' exploration of the environment with encouragement, to their vocalization of nondistress with imitation, and to their vocalization of distress with nurturance (Bornstein et al., 1992). While some theorists suggest that maternal responsiveness may not be as definitive a determinant of attachment security as suggested by Ainsworth's early work (Goldsmith & Alansky, 1987; Seifer, Schiller, Samerof & Riordan, 1996; Thompson, 1997); others maintain that parental responsiveness is a strong predictor of attachment security, but they are clear in stating that it is not the only crucial component of parenting (e.g., Cowan, 1997; DeWolff & Van IJzendoorn, 1997).

DeWolff & Van IJzendoorn (1997) conducted a meta-analysis of 66 studies (total $N=4,176$) on parental antecedents of attachment security and reported a moderately strong overall correlation between parental sensitivity and attachment security. The factors of Mutuality and Synchrony were also found to be strongly associated with attachment security. Mutuality consisted of the following maternal behaviors: "the number of positive exchanges where mother and infant attend to the same thing, and the mother's skill at modulating the baby's arousal, her entertainment value, and her

responsiveness to the infant's cues" (Kiser, Bates, Maslin, and Bayles, 1986, p. 71). Synchrony was defined as "the extent to which the interaction appeared to be reciprocal and mutually rewarding" (Isabella, Belskey, & VonEye, 1989, p. 13). Stimulation, Positive Attitude, and Emotional Support were also important predictors of attachment security. Despite their distinctive characteristics, it is evident by the definitions just provided for these other important contributors to attachment security, that sensitivity is closely related to each of them.

The concept of "sensitive responsiveness" is central to the current paper in its proposed relationship to the "respectful" stance that seems to characterize authoritative parenting. It is believed that it is the level of attentiveness conveyed by the concept of "sensitive responsiveness" that permits parents to "respect" (i.e., learn about, accept and respond to) their child's unique communications and boundaries. Critical to the concept of respect are the attributes of attention, acknowledgement, acceptance, and communicated awareness of the child's overtures and individuality without undue intrusion or interruption. In the subsequent section, individual differences in attachment patterns will be discussed in the context of describing the methods and instruments researchers and clinicians have developed to assess them.

Attachment in Infancy

Attachment theorists have based much of their initial work on naturalistic observation of infants interacting with their primary caregivers. This continues to be a

valuable research tool. A major strength of naturalistic observation is its obvious face validity; however, a weakness is that it is quite time-consuming (Colin, 1996). As a result, the “Strange Situation” was developed, a 20-minute laboratory procedure that was found to be a reliable and valid means of assessing attachment in infants; it was quickly adopted and put into widespread use. The Strange Situation is a semi-standardized laboratory procedure that provides information on attachment, exploratory, and affiliative behavior in infants (Ainsworth, Blehar, Waters and Wall, 1978). Infants ages 11 to 18 months are assessed in an unfamiliar environment, usually a laboratory room. The procedure consists of eight episodes that become progressively more stressful to the infant, so that the attachment system will presumably become increasingly activated. Stressful events include the caregiver’s not initiating interaction, the entry of a stranger and the exit of the caregiver at two points during the assessment period. Interactions upon reunion of infant and caregiver are coded in accordance with instructions provided by Ainsworth et al. (1978) within the following four general categories of behavior: (1) proximity and contact seeking; (2) contact maintaining; (3) resistance; and (4) avoidance.

On the basis of a longitudinal naturalistic observation of infants and their mothers in Uganda and a second study of 26 mother-infant dyads in Baltimore, Ainsworth, Blehar, Waters and Wall (1978) described three major classifications of attachment behavior, each with subcategories. Behavioral classifications were as follows: Group A, “avoidant” (with two subgroups), group B, “secure” (with four subgroups) and group C, “resistant-

ambivalent” (with two subgroups). These categories have been maintained in subsequent research, with the addition of a fourth category, group D, “anxious, disorganized, disoriented” (Main & Solomon, 1986, 1990), in which infants fail to show a coherent strategy for handling separations and reunions.

Infants classified as secure (group B) exhibited signs of missing their mother during her absence, then actively greeted her and resumed playing when she returned. They tended to use their mother as a “secure base” (Bowlby, 1982) from which to explore the environment, exhibiting minimal signs of anxiety and anger in response to minor separations. The secure pattern of behavior was associated with the mother’s tender, careful holding, contingent face-to-face interactions and sensitivity to infant signals throughout the first year of life (Main, 1996).

Infants classified as insecure-resistant or insecure-ambivalent (group C) appeared preoccupied with their mother throughout the period. Upon reunion, they exhibited marked anger or passivity and failed to settle and return to exploring and playing. These infants appeared anxious in their home environment. They had mothers who were not openly rejecting, but were inept in holding, and were unpredictable and noncontingent in face-to-face interactions.

Insecure-avoidant infants (group A) failed to cry during separation and ignored or actively avoided the mother upon reunion, tending to focus on the toys. At home, they exhibited marked anger with the mother, coupled with anxiety about her whereabouts,

behaviors that had not been evident in the laboratory setting. The mothers of avoidant infants were rejecting in response to their overtures, appearing averse to tactual contact with them.

Anxious, disorganized, disoriented (group D) infants failed to demonstrate a consistent strategy to handle separations and reunions, instead some exhibited contradictory behaviors simultaneously, such as approaching the mother with head averted, or disordered sequences of behavior, for example, crying spontaneously after having settled down to play. Other behaviors which characterized infants classified in this category include: stereotyped, repetitive gestures; freezing; open fear of the caregiver; high avoidance and resistance within the same episode; attachment behavior directed to the stranger during reunion with the caregiver; and dazed, disoriented, depressed or flat (i.e., lacking affect) facial expressions. It has been proposed that children in this category have often been abused or neglected; however, extensive home observations of these infants interacting with their mothers are lacking as yet (Colin, 1996).

Correlates of Attachment Organization

Social Behavior

Secure infants, in comparison to insecure infants, have been found to exhibit greater ego resilience and higher levels of exploratory and social competence when observed later in peer and school settings (e.g., Arend, Gove, & Sroufe, 1979; Pierrehumbert, Iannotti, & Cummings, 1985; Pierrehumbert, Iannotti, Cummings, & Zahn-

Waxler, 1989; Vandell, Owen, Wilson, and Henderson, 1988; Waters, Wippman, & Sroufe, 1979). Sroufe (1983) found that preschool children who were securely attached as infants displayed more positive affect toward others and were more popular with peers, as well as more compliant and empathic.

Avoidant children are more likely to victimize others, whereas ambivalent-resistant children typically are their victims (Main, 1996). Troy and Sroufe (1987) paired preschoolers from the various attachment classifications and coded their interactions for instances of victimization, defined as a relationship characterized by a sustained pattern of exploitation and manipulation. The researchers found no occurrences of victimization in dyads that included a securely attached child; the securely attached children were not victimized by, nor did they bully, their partners. In contrast, victimization occurred in all five pairs comprised of two avoidant or an avoidant and a resistant child. In the sole resistant-resistant pair, neither child was persistently victimized. Avoidant attachment in infancy has also been associated with a lack of empathy, emotional insulation, and hostile or antisocial behavior during the preschool period (Sroufe, 1988^a; Sroufe, 1988^b). Avoidant children appear systematically to exclude from awareness information that may activate attachment behavior (Main, 1981) and tend to develop strategies that limit their awareness of negative affect in general (Cassidy & Kobak, 1988). The defensive process that constitutes an effective adaptation to the insensitivity and rejection they have endured apparently gets carried into other situations in which it is maladaptive (Colin, 1996).

Grossmann and Grossmann (1991, p. 9) have proposed that “avoidant strategies negate negative emotions in order to maintain personal integrity at the expense of reality.”

With regard to dependency, the untrained observer may conclude that insecurely attached children are more independent than their securely attached peers, but systematic observation reveals that both avoidant and resistant children are more dependent on multiple measures of dependency (Sroufe, Fox, & Pancake, 1983). Both groups of insecurely attached children required similarly high levels of support, with the resistant children punctuating their attention-seeking behavior with impulsivity, anxiety, passivity and helplessness.

Jacobson and Wille (1986) conducted a study of 24 children, with equal numbers of children who had been classified as secure, avoidant and resistant at 18 months. The researchers paired each of the experimental children with an unfamiliar, securely attached age peer and observed play sessions later when the children were ages two to three. The hypothesis being tested, that the focal children’s attachment pattern would be associated with differences in their sociability and responsiveness to peers, was not supported; however, other interesting findings did emerge. Differences in the focal children’s attachment patterns at 18 months predicted their peers response to them. The secure children received the greatest number of positive responses, while the resistant children received more positive responses than the avoidant ones. However, resistant children were also subjected to more disruptive and antagonistic responses, as well as more

resistance from their securely attached playmates.

In summary, it appears that infants who are anxiously attached demonstrate less proficiency in social interactions as they develop and elicit more negative responses from others in their social environment. Avoidant infants have a particular tendency to develop manipulative, coercive patterns of interaction with their parents and peers, possibly preying on other insecurely attached children, most commonly those with resistant attachment strategies. In contrast, children classified as secure in infancy tend to respond to others with more positive affect and are inclined to be more cooperative, compliant and in tune with the emotions of those around them.

Cognitive Development

Intuitively, it seems to make sense that having a “secure base” from which to venture out in exploration of the environment, something that can free attentional resources to be directed at learning rather than concerns about security, may confer an advantage in the interest of a child’s cognitive development; However, studies examining whether securely attached children are more advanced cognitively than insecurely attached children have produced mixed results (Colin, 1996).

Harmon, Suwalsky and Klein (1979) examined the quantity and quality of play in infants with different attachment patterns and found that, while avoidant infants spent the most time playing with objects, they played in ways that were less advanced than age peers in other attachment categories. Pipp, Easterbrooks and Harmon (1992) utilized the

Strange Situation paradigm with age-corrected procedures to assess the attachment classification of children of three different age groups: 12, 24 and 36 months. Age-corrected scoring methods were used because the the Strange Situation assessment is generally administered between the ages of 11 to 18 months. The researchers found no differences in cognitive ability measured by a series of simple questions (e.g., “what,” “where,” “who” questions; point to a certain person) in 12 month old children as a function of attachment classification. However, they found superior performance by the securely attached two year olds relative to their insecurely attached peers, with an even larger positive differential in the securely attached 36 month olds. In addition, they observed that securely attached children of all ages exhibited more complex actions on their own and in interactions with their mothers than the insecurely attached children.

Several studies have demonstrated that even in the absence of demonstrated differences in cognitive abilities, securely attached infants are more positive in their approach to challenges and more resilient in the face of frustration. Matas, Arend and Sroufe (1978) classified infants utilizing the Strange Situation paradigm at 18 months and then observed the subjects at age two while tackling a challenging tool problem, playing, and cleaning up the play area. Secure children exhibited greater persistence, were more enthusiastic, cooperative, and generally more effective at problem-solving than the insecurely attached children. They exhibited less frustration, less negative affect, less whining and crying, and less aggression toward their mothers throughout the observation

period. In addition, the mothers of securely attached children were available and effective helpers.

The securely attached children in this study were also superior on one measure of cognitive development: the presence of symbolic play, which is an indication of the transition from sensorimotor to preoperational intelligence. Consistent with these results, Slade (1987) found more high-level symbolic play in securely attached 16 ½ to 18 month olds than insecurely attached age peers. Taken together with the previous study, this suggests that secure toddlers move into representational thought earlier than those in insecure classifications (Colin, 1996).

Erikson and Farber (1983) found that securely attached 3 ½ year old children from a low socioeconomic sample were more effective in their approach to cognitive tasks than children with resistant attachments, who exhibited greater frustration, more anger, and less enthusiasm, persistence and compliance, along with greater reliance on their mothers for support. Van IJzendoorn (1988) observed parent-child dyads at three age groups (1 ½, 3 ½ and 5 ½ years) engaging in a literacy task and found securely attached children were less easily distracted and there was less need to discipline them. VanIJzendoorn, Sagi, and Lambermon (in press) calculated a summary score for the quality of children's "attachment network," based for each subject on the quality of attachments with both parents and with a third primary caregiver. The resultant score was found to be significantly correlated with IQ at age 5, with greater security associated with higher IQ

scores.

Jacobsen, Edelstein, and Hofman (1994) conducted a longitudinal study of eighty-five Icelandic children examining the relationship between attachment representations, self-concept, and cognitive functioning in childhood and adolescence. The researchers assessed cognitive functioning at ages 7, 9, 12, 15, and 17 years administering a battery of Piagetian tasks, controlling for IQ and attentional difficulties. Children with secure attachment representations exhibited superior cognitive abilities as compared to the children who were insecurely attached. The authors found that self-confidence played a significant, but variable role in moderating the effects of attachment style on cognitive functioning. Particularly relevant to the current proposal was their finding that children with insecure-disorganized attachment were particularly disadvantaged at deductive reasoning tasks. In a subsequent section, the possible ways in which deductive reasoning may be adversely affected by “disrespect” in the early environment will be discussed.

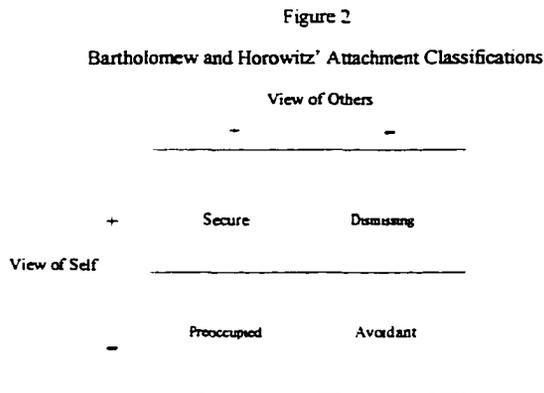
In summary, it appears that children classified as securely attached in infancy outperform those classified as insecurely attached on certain measures of cognitive development, with some differential results depending on the type of insecure subclassification. Overall, it appears that avoidant children often perform as well as secure children on test scores indicating level of cognitive development, but exhibit a less adaptive response to the stress inherent in problem-solving (Colin, 1996). Resistant children exhibit the same poor management of challenge and frustration, relative to their

secure age-peers, with slightly more indication of deficient performance on assessments of cognitive development.

Attachment in Adolescence and Adulthood

Studies of attachment in adolescence and adulthood reveal that patterns of interaction established in infancy, as well as reactions to separation, remain remarkably stable over time. What changes as a child matures is the addition of new attachments, including peer and eventually romantic attachments, both of which encompass considerably greater reciprocity (Colin, 1996). Cognitive schemata of attachment figures become increasingly important as an individual matures, with “working models” of attachment assuming a key role in shaping individuals’ perceptions of and behavior in key relationships.

Bartholomew (1990) reformulated Hazan and Shaver’s (1987) attachment measure, drawing upon Bowlby’s (1977) suggestion that early attachment experiences are internalized by the child in the form of working models of self and others. In Bartholomew’s conceptualization, the variables of “models of self” and “models of others” were dichotomized into a matrix of four prototypical adult attachment styles. Bartholomew has proposed that working models of self can be dichotomized as either positive or negative (as worthy of support or not), as can their model of the other (seen as trustworthy and available vs. unreliable and rejecting). From this, four combinations can be derived (See Figure 2 below).



Secure attachment is associated with a positive conception of both self and others. Preoccupied attachment indicates a sense of unworthiness or unlovability along with a positive evaluation of others. Fearful attachment is thought to be associated with a negative self evaluation, coupled with the expectation that others also will be negatively disposed (untrustworthy and rejecting); and Dismissing attachment is characterized by a sense of self-worth, coupled with a negative disposition toward others.

Mickelson, Kessler and Shaver (1997) examined a large, nationally representative sample of American adults in relation to sociodemographics, experiences of childhood adversity, parental representations, adult psychopathology, as well as personality traits related to adult attachment in an attempt to replicate and extend previous findings. They

found a distribution of attachment styles similar to that found previously: 59% secure, 25% avoidant, and 11% anxious.

Childhood adversities, particularly of an interpersonal nature, were strongly related to insecure adult attachment. However, not all childhood adversities were related to subsequent attachment insecurity; rather the most consistent associations were seen with histories of physical abuse and serious neglect, which were strongly related to increased anxious and avoidant attachment and an overall decrease in secure attachment.

Relationships between attachment style and several sociodemographic variables that had not previously been reported also were found, including associations with income, age and race.

Parental psychopathology exhibited a strong positive relationship with insecure attachment, but only one significant correlation with secure attachment; both maternal and paternal antisocial behavior were negatively correlated with attachment security. Maternal and paternal depression, anxiety and substance abuse were significantly associated with attachment insecurity, particularly avoidant attachment. Mothers' anxiety was strongly correlated with anxious attachment in their adult offspring. Paternal anxiety exhibited weaker, but significant correlation with anxious attachment, as well. A strong positive correlation between maternal antisocial behavior and avoidant attachment styles was found. Paternal suicidal behavior was positively correlated with both anxious and avoidant attachment, while maternal suicidal behavior was related only to anxious

attachment.

Researchers performed an analysis to examine the hypothesis that maternal factors are stronger correlates of attachment style than paternal factors, as has been proposed on the basis of previous research. These analyses revealed two significant differences in relative impact: 1) maternal antisocial behavior exhibited a stronger, positive relationship with avoidant attachment than paternal antisocial behavior, and 2) the extended absence of the mother was related more strongly (and negatively) to secure attachment than extended absence of the father.

In this study, the Parental Bonding Instrument (PBI) was also used to assess associations between adult attachment ratings and parental representations. Three dimensions of the parent-child relationship were assessed: warmth, overprotectiveness, and consistency. Maternal and paternal warmth were found to be significant predictors of all three attachment classifications, with warmth exhibiting a positive relationship with attachment security and a negative relationship with the two insecure subtypes. Maternal-paternal differences emerged for overprotectiveness on all three attachment subtypes. Paternal overprotectiveness was related positively to secure attachment and negatively with avoidant attachment, whereas maternal overprotectiveness was related positively to avoidant attachment. Mothers with insecure attachment patterns were more likely to have children with anxious attachment, and were more likely overprotect their children; greater attachment anxiety in children was associated with more maternal overprotection.

Parental consistency was not significantly correlated with any of the adult attachment ratings. Only one significant maternal-paternal difference was found for consistency; maternal consistency was related positively to anxious attachment, while paternal consistency exhibited a negative relationship. The researchers believed that the strength of the potential association between parental consistency and attachment security may have been obscured in this research, possibly by the means by which it was measured. Consistency was a measure derived from administration of a brief version of the PBI. The brevity of the scale, as well as the impact of perceptual biases in respondents may have diluted a potential relationship between parental consistency and attachment. The current study will assess whether this relationship emerges when a different assessment approach is employed.

Moderating Factors in Early Social, Emotional, and Cognitive Development

Perceived Parenting Style, Behavioral Adjustment, and Psychopathology

Baumrind (1967, 1971) described Authoritative parenting as one of three prototypical parenting styles. According to the model, Authoritative parenting is characterized by parental warmth, the use of inductive discipline, nonpunitive parenting practices, and consistency (Steinberg et al., 1994). Authoritative parents are viewed as providing clear, firm direction for their children, but “disciplinary clarity is moderated by warmth, flexibility and verbal give and take” (Buri, 1991, p. 111). Authoritative parenting has been associated with numerous positive developmental outcomes in children and

adults, including enhanced psychosocial development (e.g., Harralson & Lawler, 1992), more positive self-esteem (Klein, O'Bryant, & Hopkins, 1996; Parish & McCluskey, 1992), higher levels of academic achievement, better coping, and reduced behavior problems (e.g., Cohen & Rice, 1997; Glasgow et al., 1997; Steinberg, Lamborn, Dornbusch, & Darling, 1992).

Parish and McCluskey (1992) surveyed 123 college students in order to assess their self-concepts, evaluations of parents, and perceptions the style by which they were parented. The researchers most noteworthy finding was that students' self-concepts were found to vary directly with perceived level of parental warmth, but did not vary as a function of their parents' level of restrictiveness. The findings could be interpreted as suggesting that parentally-applied limits do not detract from the positive effects of parents' warmth on the self-esteem of their children; in fact, parental warmth may have an ameliorating influence on the necessary application of developmentally appropriate limits.

Negative parenting practices have also been linked to higher rates of psychopathology, substance abuse, and other maladaptive behaviors in children. Radziszewski, Richardson, Dent, & Flay (1996) examined the relationships between parenting style and adolescent depressive symptoms, smoking and academic achievement. Generally consistent with previous findings, adolescents with authoritative parents exhibited the best outcomes and those with "unengaged" parents were least well adjusted. Unengaged parenting refers to an extreme subtype of "permissive," where the adolescent

typically makes decisions without parental input. Adolescents whose parents were permissive or autocratic were characterized by intermediate levels of adjustment.

Weiss and Schwartz (1996) reported similar, significant relationships between Unengaged and Authoritarian-Directive parenting styles, and personality disorders, adjustment problems, academic achievement deficits, and substance abuse in a sample of 178 college students. Jackson, Bee-Gates, & Henriksen (1994) found a positive relationship between authoritative parenting practices, child competency level, and significantly lower rates of smoking intention, initiation, and experimentation. Cohen and Rice (1997) studied a sample of 386 matched parent-child pairs from a public middle school in the Southern United States and found that high grades were associated with children's and parents' perceptions of higher authoritativeness, lower permissiveness, and lower authoritarianism. Child tobacco and alcohol use was associated with child perception of lower authoritativeness and higher permissiveness, while parent perception of parenting style was not associated with child substance use. The overall trend in the literature seems to be that children's perceptions of their parents' style of parenting are more reliable predictors of outcome indices than parents' self-assessments.

Significant relationships have been found between parenting practices and severe developmental disorders, such as non-organic failure to thrive. Black, Hutcheson, Dubowitz, and Berenson-Howard (1994) examined differences in several developmental indications of competence among 102 low-income, inner-city, predominantly African-

American children with non-organic failure to thrive and a comparison group of 67 age-, gender-, race-, and socioeconomically-matched children who exhibited adequate indices of growth and development. The authors categorized parents into nurturant, authoritarian, and neglecting groups based on observations of their approach to feeding their children. The researchers found that parents of children with nonorganic failure to thrive were less nurturant and more neglecting than parents of comparison children. Relationships between parenting style and children's social-cognitive development were consistent across subject groups. In both the nonorganic failure to thrive group and the comparison group, children of nurturant parents consistently demonstrated significantly better social-cognitive development, as compared with those with authoritarian and neglecting parents.

There is evidence that positive parenting practices constitute a significant resiliency enhancer, which helps to offset the deleterious impact of developmental anomalies in children. Negative parenting practices can also apparently add to other risk factors' effects. Krener and Cranston (1990) found that school children with neuropsychological handicaps, who also had parents who exhibited controlling, intrusive, or otherwise maladaptive parenting practices in their children's physician's office had more behavioral problems, decreased competence on language measures, and lower academic achievement in accordance with their IQ level.

There is evidence that different styles of parenting exert their influence in diverse ways across development. In a longitudinal design, Steinberg et al. (1994) examined the

effects of parenting style over the course of development and determined that the long-term benefits of authoritative parenting were predominantly seen in maintenance of previously high levels of adjustment, while the negative consequences of neglectful parenting continued to accrue over time. This finding highlights the apparently multidimensional impact of parenting practices on the functioning of children, as well as the reciprocal determinism of increasingly maladaptive child-parent interactions, which appear to exert a cumulative, adverse impact on progressive stages of child and adolescent development.

It should be noted that there have been questions raised as to whether Baumrind's classification may be ethnocentric, based primarily on European-American culture and values. The key component of parental "respect," as it applies across cultures may be the existence of contingencies that are sufficiently normative to be somewhat predictable, and that these contingencies and their behavioral and emotional outgrowths are predominantly consistent with and supported by the greater sociocultural context. This may then achieve the presumed sociobiological objective for humans of enabling orchestration of one's strategy with the strategy of others with sufficient efficiency to achieve the most effective adaptation possible to a given context.

This view highlights some of the possible risk factors for behavioral and emotional maladjustment in an economically and culturally diverse society. The greater diversity in parenting strategies that, by definition, characterizes more heterogeneous cultural

contexts, considered in conjunction with the extent to which the dominant cultural context may force proximal, maladaptive accommodations in strategy could result in parental, child, and familial distress. Together, these factors may discourage positive self-esteem and adaptation, and significantly increase the risk that a child will develop maladaptive behaviors in reference to the larger cultural context.

In summary, it appears that parental “respect” as expressed within a given culture cannot be adequately assessed in isolation, without reference to the overall cultural context. At minimum, this would include consideration of the degree of cultural diversity in the community, social support for cultural values and behaviors, and the degree to which values and behaviors are influenced by the “dominant” culture, influence that could vary considerably at different stages in development. A key component of “respect” that could be disrupted in families who are in the process of cultural assimilation is the clear communication and implementation of parental expectations, which could be rendered confusing if standards of the family culture conflict with those of the larger cultural context. Certain compensatory adaptations might insulate against these stressors, such as establishing and maintaining cultural microcosms, within which the family’s cultural norms are supported and validated.

Environmental Adversity

Taking into account the importance of genetic diatheses in conferring vulnerability to certain disorders, an increasing volume of research has linked various types of social

adversity, such as abuse, trauma, environmental chaos and inconsistency to social, emotional and behavioral maladjustment (e.g., Flinn & England, 1995; Mallinckrodt, McCreary, & Robertson, 1995). Stress that stems from critical, intrusive, or otherwise punitive parenting practices has been linked to the development of behavior problems, including Oppositional Defiant Disorder (Speltz, DeKlyen, Greenberg, & Dryden, 1995), and Reactive Attachment Disorder (Mickelson, et al., 1997).

Deficiencies and alterations in mother-child interactions such as those associated with maternal depression may be contributing factors to these psychological and behavioral difficulties (Radke-Yarrow, Nottelmann, Martinez, & Fox, 1992; Rothbaum, Rosen, Pott & Beatty, 1995; Shaw & Vondra, 1995) and there are indications that the severity of the mother's impairment coincides with the degree of child maladjustment (Teti, Messenger, Gelfand, & Isabella, 1995). The course of the child's development may be negatively impacted by disrupted mother-child social contingencies, affecting the level and quality of shared behavioral states such as synchrony and joint attention, interactions that are believed to contribute to the development of empathy and social-emotional self-regulatory skills.

The level of environmental adversity to which infants are exposed may impact their responsiveness to stress. Researchers have found that stress responsiveness as measured by cortisol excretions varies systematically with attachment classification and the characteristics of an infant's early rearing environment, suggesting that infants use their

caregivers' response as an external biobehavioral regulator prior to developing the capacity to regulate their behavior more internally (Spangler, Schieche, Ilg, Maier & Ackerman, 1994). "Unexpected" fluctuation in environmental circumstances communicated biologically to an infant may take the form of accelerated cortisol excretion, which could be one mechanism by which brain chemistry may be altered both temporarily and in a more enduring manner, through possible impacts on the developing brain that may prepare the individual to be more attuned to environmental fluctuation, as would be the case with deficient LI.

The current paper follows other researchers (e.g., Feldon & Weiner, 1991; Feldon & Weiner, 1997, research in progress) in proposing that molecular aspects of information processing such as LI may be significantly impacted by early environmental stressors, possibly with far-reaching influences on information processing proficiency, behavioral adjustment, and psychopathology. This view coincides with rapidly accumulating evidence suggesting that tendencies toward stress overresponsiveness and elevated cortisol levels occur in conjunction with many forms of behavioral dysfunction and psychopathology (Colomina, Canals, Carbajo, G., & Domingo, 1997), including schizophrenia (Walker, Neumann, Baum, & Davis, 1996), depression (Hart, Gunnar, & Cicchetti, 1996; Van Londen, Goekoop, Zwinderman, Lanser, Wiegant, & DeWied, 1998), oppositional defiant disorder (van Goozen, Matthys, Cohen-Kettenis, Gispen-de Wied, Wiegant, & van Engeland, 1998), aggressive behavior (Schultz, Halperin, Newcorn,

Sharma, & Gabriel, 1997) delinquency, impulsivity, and substance abuse (Moss, Vanyukov, & Martin, 1995), as well as deficiencies in social competence (Gunnar, Tout, de Haan, Pierce, & Stansberry, 1997) and information-processing skills (Gunnar et al., 1997; Van Londen, et al., 1998). There are data suggesting that some of these tendencies may be at least partially environmentally induced, through child maltreatment (Hart, Gunnar, & Cicchetti, 1995) and parental psychopathology (Battaglia, et al., 1997).

Information Processing: Latent Inhibition

Definition and Basic Paradigm

As described previously, LI refers to the situation in which non-reinforced pre-exposure to a stimulus retards conditioning to that stimulus when it is later paired with a reinforcer. This is primarily considered a useful and adaptive response to a reasonably stable environment. Lubow and Moore (1959) labeled the effect “Latent Inhibition” because they hypothesized that nonreinforced pre-exposure to a stimulus may result in the acquisition of inhibition, which subsequently would interfere with excitatory conditioning. However, the discovery that non-reinforced preexposure to a stimulus would retard not only excitatory, but inhibitory conditioning as well, suggested that the term was something of a misnomer (Rescorla, 1971; Halgren, 1974; Baker & Mackintosh, 1977). It appears that a stimulus that has been preexposed without reinforcement is simply less likely to enter into any new associations, whether excitatory or inhibitory (Mackintosh, 1983). A better name for this process, which has been used in some of the more current research,

might be “learned irrelevance.” This nomenclature highlights the extent to which, through nonreinforcement (i.e., irrelevance in the current context), certain stimuli in the perceptual array acquire properties that discourage the development of either excitatory or inhibitory associations between them and other stimuli, thus reducing the salience of these stimuli as components in an organism’s information processing.

The typical procedure for examining LI in animals involves use of a conditioned emotional response (CER), also known as the conditioned suppression procedure (Estes and Skinner, 1941), with pre-exposure, acquisition, and test phases. During the pre-exposure phase, the to-be-conditioned stimulus (e.g., a tone) is presented to animals in the experimental group (the group that will acquire LI) repeatedly without reinforcement while the animal is engaged in a high probability response (e.g., in a thirsty rat, licking from a water tube).

The acquisition phase involves pairing the preexposed tone with an unconditional stimulus (e.g., shock). In rats, suppression of ongoing licking behavior is observed in the presence of shock, so this can be used as an indication of the extent to which animals have acquired a conditioned response to the conditional stimulus (CS), the tone.

During the third phase, referred to as the test phase, the extent to which the animal exhibits suppression of licking during the presentation of the CS is measured. If the animal has learned the CS-US association during the acquisition phase, lick suppression should occur with the presentation of the CS, which would have acquired a learned

association with the shock. LI is exhibited when animals who have been preexposed to the CS do not exhibit lick suppression to the presentation of the CS during the test phase, in contrast with the suppression that is observed in the non-preexposed control animals. The absence of lick suppression in the presence of the tone (CS) in the preexposed group is presumably attributable to diminished learning of the CS-US association during the acquisition phase, due to these subjects' having been exposed repeatedly to nonreinforced presentations of the CS during the pre-exposure phase.

Latent Inhibition: Human Research Paradigms

In the study of LI in humans, four classes of paradigms have been used: instrumental learning-to-criterion tasks, eyelid conditioning, conditioned taste aversion and electrodermal conditioning (Lubow & Gewirtz, 1995). Conditioned taste aversion and electrodermal conditioning will not be described here, but are discussed in detail elsewhere (See Lubow, 1989). In each of these paradigms experimental subjects are preexposed to the to-be-conditioned stimulus during the initial phase, after which they are tested for their ability to learn an association to the preexposed stimulus, as compared to nonpreexposed control subjects. LI is said to have occurred when the preexposed subjects learn this association more slowly than nonpreexposed subjects for whom the to-be-conditioned stimulus is novel.

The most common paradigm used to demonstrate LI in adult humans involves instrumental learning-to-criterion tasks. The first procedure developed was an auditory

task, which involved two phases: a pre-exposure phase, employing a masking procedure, and a test phase (See, e.g., Ginton, Urca, & Lubow, 1975). In one such procedure, subjects in the experimental group (i.e., the preexposed group that is always expected to demonstrate LI during the test phase, if LI is intact) are instructed to listen carefully to a recording and count the number of syllables. They are told that they will be asked to report the numbers when the recording ends. The requirement of monitoring the syllables constitutes the masking procedure, which is intended to direct subjects' attention away from the to-be-conditioned stimulus, usually white noise. Control subjects are instructed to perform the masking task, but are not preexposed to the to-be-conditioned stimulus. It has been determined that the experimental context must stay constant throughout the experiment in order for LI effects to occur.

Immediately following the preexposure phase is the test phase, in which all subjects listen to a recording with both nonsense syllables and bursts of white noise. Subjects are given instructions to determine the rule by which points are being added to a counter, the rule being that a point is added with the onset of the target stimulus (i.e., white noise). The session is ended after a learning criterion is reached. The learning criterion consists of a prespecified number of consecutive correct responses in which the subject presses a designated computer key in the presence of the target stimulus in anticipation of the impending counter change. Nonpreexposed subjects are treated in a manner identical to the preexposed subjects, with the exception that they are not preexposed to the target

stimulus. LI is observed when the preexposed subjects exhibit slower learning than the nonpreexposed subjects to the target stimulus in the test phase (Lubow, Weiner, Schlossberg & Baruch, 1987; Baruch, Hemsley, and Gray, 1988^a).

Lubow (1997) described procedural problems related to measuring LI in humans, which he believes may render some of the findings to date equivocal, including the possibility of Novel Popout Effects (e.g., Johnston, Hawley, Farnham, 1993), as well as the limitations of utilizing a between-subjects, rather than a within-subjects design, particularly when examining LI in conjunction with individual difference variables such as measures of psychopathology. Lubow also cites as problematic the absence of a continuous measure of LI in the classic approach. Lubow proposes that a visual search paradigm which utilizes Reaction Time (RT) as the dependent variable may be a more methodologically sound means of measuring LI effects.

The present study will employ a computerized, visual instrumental learning-to-criterion task (Braustein-Bercovitz & Lubow, 1998), despite the limitations previously described, due to the belief that it is among the most reliable procedures developed to date to measure LI in humans, other than psychophysiological procedures, which would be impractical here. Details of the procedure are described in the “Methods” section.

Latent Inhibition and the Schizophrenia Spectrum

Latent Inhibition as an Animal Model of Schizophrenia

A number of researchers have reasoned that since LI seems to involve attentional

processes, the paradigm may be useful in the study of psychopathologies in which attentional deficits are a significant feature, the most prominent of these being schizophrenia. It was discovered that the effect could be disrupted in animals by both the chronic administration of d-amphetamine and by acute d-amphetamine administration when receptor sensitivity is previously enhanced by haloperidol (Solomon et al., 1981). These findings are consistent with accounts of schizophrenia that view excesses of dopamine as playing a central role in the expression of positive symptoms and also support the effectiveness of antipsychotics such as haloperidol in effectively treating these symptoms. The failure to respond appropriately to irrelevant stimuli, instead, actually responding to them in thought or in action as if they were relevant, is regarded by some theoreticians as a defining feature of schizophrenia (Lang & Buss, 1965; Payne, Matussek, & George, 1959; Shakow, 1962); this view is perpetuated in some of the most current formulations of LI (e.g., Weiner, 1990; Weiner & Feldon, 1997; Weiner, Tarrasch, Bernasconi, Broersen, Ruttimann & Feldon, 1997), which cite drug-enhanced switching to respond according to the stimulus-reinforcer contingency as the mechanism by which amphetamine may disrupt LI.

Human Research on Disruption of Latent Inhibition in Subjects with Schizophrenia and Hypothetical Psychosis-Proneness

Baruch, Hemsley & Gray (1988^a) found that preexposed normal subjects and chronic schizophrenic subjects demonstrated LI, while acute schizophrenics failed to exhibit the

effect. In an interesting follow-up to this experiment, subsets of both the acute and chronic patients were retested six to seven weeks later, at which time both groups exhibited LI. While the authors indicate that the major factor in the restoration of LI in acute schizophrenics at follow-up is likely the dopamine-stabilizing effect of neuroleptic medication over continued treatment, they also suggested that there may be an "adaptive narrowing of attention" which accompanies the progression of schizophrenic psychopathology and possibly contributes to the return of LI. A recent study provides evidence for this hypothesis, in that LI was found to be disrupted in drug naive acute, but not chronic schizophrenics, suggesting that even in the absence of neuroleptic medication, LI effects are reinstated as the disorder progresses, possibly by natural compensatory processes (Gray, Pilowsky, Gray, & Kerwin, 1995).

Baruch, Hemsley, & Gray (1988^b) extended these findings by demonstrating that the disruption in LI is also seen in subjects who are hypothetically "psychosis prone," research that was replicated successfully (Lubow, Ingberg-Sachs, Zalstein-Orda, & Gewirtz, 1992). These results, considered in light of the previously cited recent finding of a return in LI in neuroleptically naive chronic schizophrenics (Gray et al., 1995), suggest that there may be a threshold reached in the trajectory of a newly-schizophrenic subject, after which corrective processes ensue, leading to more deficient LI in some "less impaired" subjects.

Differential Effects of Masking Task Processing Load in Subjects with High vs. Low Levels of Schizotypy.

De laCasa, Ruiz, & Lubow (1993) examined groups identified as high vs. low psychotic prone with regard to whether these groups differentially attended to irrelevant stimuli while engaged in a cognitive task (i.e., a masking task) and found that, depending upon the duration of the PE phase, psychosis-prone individuals did appear to process the irrelevant stimuli to a greater extent than individuals in the low psychotic-prone group. Primary conclusions drawn were that schizophrenics and high psychosis-prone individuals show reduced LI even in the presence of a masking task (the function of which is to draw the subjects attention away from controlled processing of the irrelevant stimuli) because they do not maintain attention to the task at hand. Instead, their attention is diverted to the currently irrelevant PE stimulus, which results in reduced LI during the test phase, similar to the outcome in subjects who do not engage in a masking task during the PE phase.

Braustein-Bercovitz and Lubow (1998) followed up on the authors' interpretation of their findings, examining the prediction that the processing load of the masking task may differentially affect LI in individuals characterized by high versus low levels of schizotypy. Their findings were consistent with predictions; individuals high on the continuum of schizotypy did in fact exhibit enhanced LI in the high load condition, consistent with the notion that they allocated more focus to the preexposed stimuli than to

the high load masking task at hand. In a related finding, Swerdlow (1996) found that LI could be reliably demonstrated in subjects with acute schizophrenia utilizing an easier, computer-administered, visual task, suggesting that the LI deficiencies found in subjects with schizophrenia in some previous studies may have been attributable to the processing demands of the tasks employed. The critical element of these findings to the current study is the extent to which task demands may impact LI depending on subject characteristics, possibly due to variation in processing patterns in response to stress that may occur due to developmental outgrowths of the subject's early environment.

Latent Inhibition as a Function of Other Individual Differences

Attention-Deficit Hyperactivity Disorder

In the only study of LI in children with Attention-Deficit Hyperactivity Disorder, Lubow and Josman (1993) compared LI in temporarily nonmedicated subjects with ADHD to LI in normal subjects, initially expecting that subjects with ADHD would exhibit an enhanced LI effect. This was expected because nonmedicated schizophrenic subjects, who presumably are in a hyperdopaminergic state, show reduced LI, which is restored by antipsychotic drugs that act as dopamine antagonists. Ritalin, the primary treatment for ADHD, is an indirect dopamine agonist, suggesting that subjects with ADHD might exhibit augmented LI. The dopamine status of subjects with ADHD theoretically parallels the hypodopaminergic status of Parkinson's patients, who show an enhanced LI effect when compared with age-matched and young normal subjects

(Salzman, 1993).

Despite the apparent soundness of these predictions, Lubow and Josman (1993) found that LI was abolished in subjects diagnosed with ADHD, compared with intact LI in a young group of normal control subjects. This effect resulted from the younger (median age 5½ years) non-preexposed (NPE) subjects with ADHD performing more poorly than the corresponding NPE control subjects.

On first examination, these results appeared to contrast with the situation with subjects with schizophrenia and schizotypy, in whom the diminished LI effect is attributed to superior performance on the part of the stimulus preexposed (PE) subjects, as compared with the PE normal subjects, a finding that has consistently been cited as evidence that diminished LI isn't attributable to a general processing deficit in these subjects. In other words, subjects with schizophrenia and schizotypy actually learn an association to the PE stimulus more quickly after having been preexposed to it with no consequence, rather than more slowly as would be the case in a subject exhibiting intact LI. The results produced by subjects with ADHD provided an alternate route to diminished LI. The younger NPE subjects with ADHD learned more slowly during the test phase than the NPE control subjects, resulting in a smaller discrepancy between the PE and NPE subjects with ADHD as compared to the PE/NPE discrepancy in the control group. A tabular depiction contrasting these alternative routes to LI diminution is presented in Figure 3, below, for clarification.

Figure 3

Comparison of Alternative Routes to Diminished LI in Subjects with Schizophrenia/Schizotypy and ADHD

Schizophrenia/Schizotypy:	Faster PE Performance
ADHD:	Slower NPE Performance

LI is measured as the difference in speed of learning an association with a target stimulus between groups (drawn from a given subject population) who have either been preexposed (PE) or not preexposed (NPE) to the target stimulus. LI is exhibited when preexposure to the target stimulus, when it is not reinforced (i.e., when it is not relevant to the task), subsequently results in slower learning on the part of PE subjects in conjunction with that stimulus during the test phase (i.e., when the target becomes relevant).

The authors concluded that the “immediate inference” to be drawn from the results with subjects with ADHD is that “the underlying attentional mechanism(s) which (is) disrupted in the schizophrenia/ schizotypy populations is quite different from the one that is disturbed in hyperactive subjects.” This also might be inferred from presumed differences in the neurochemistry underlying these two disorders. The researchers suggested that these results may be due to the differential way in which subjects with ADHD process (or rather, fail to process) contextual information while engaged in a context-irrelevant task. If the NPE group with ADHD did not process contextual information during the masking portion of the experiment, then at the time of testing the new stimulus would be presented in a functionally novel environment, a situation that does not facilitate learning (Lubow, Rifkin and Alec, 1976). The authors concluded that children with ADHD were deficient in LI because they “failed to process information that was irrelevant to their primary task.” In support of this, the authors cited studies showing

that subjects with ADHD do not differ from control subjects on simple learning tasks, as long as performance is not dependent on processing irrelevant information from a prior phase of the experiment (e.g., Douglas, 1988; Freibergs & Douglas, 1969).

To summarize the alternative interpretation of the previous findings, the pattern of performance seen in subjects with ADHD and subjects in the schizophrenia spectrum suggests that stress may be a factor that alters the means by which an individual processes contextual information, thus may affect the manifestation of (or failure to manifest) LI. The level of processing demand, salience of stimuli, and motivational factors may all contribute to differential processing of both the focal and contextual stimuli in different populations, resulting in diminished, intact, or enhanced LI. One area of potential correspondence between subjects with schizophrenia and schizotypy, and subjects with ADHD may lie in the possibility that stress aroused by performance of a sufficiently demanding masking task alters these subjects' approach to information processing, possibly at a neurological level, which in turn could affect the expression or absence of LI.

Obsessive Compulsive Disorder

Swerdlow, Hartston and Hartman (article in press, 1998) utilized a simple, yet sensitive, task to assess LI in subjects with Obsessive Compulsive Disorder (OCD). The subjects with OCD exhibited significantly more LI; specifically, if subjects with OCD were preexposed to the to-be-conditioned stimulus (CS) without reinforcement prior to the test phase, these subjects required significantly more trials to learn a new association to this

CS, as compared to normal control subjects. The researchers found that this effect was particularly evident in unmedicated subjects with OCD. They interpreted this finding as potentially providing a quantitative measure of these subjects “tendency to remain ‘stuck in set’ on this cognitive task” (p. 2), which could be construed as an inability to depart from previously learned information (in this case, that the PE stimulus was inconsequential).

Conclusion

Clearly, more work needs to be done in this area, both to replicate these results and to delineate the source of variation of LI deficiencies in subjects with various patterns of psychopathology. Given increasing data regarding the neurochemistry associated with various psychological disorders, which will be reviewed in the next section, LI research may help to clarify further the role of neurotransmitters such as dopamine in the expression and disruption of LI, as well as whether the role of given neurotransmitters differs across groups characterized by different patterns of psychopathology. Future research may also help to disentangle: 1) the extent to which LI expression and disruption is trait-dependent, state-dependent, some combination of both, or differentially determined across subject groups; 2) how do the characteristics and the processing demands of the task employed to measure LI affect its expression, particularly in conjunction with certain subject characteristics; and 3) how might these findings elucidate our understanding of how LI impacts overall information processing facility, including attentional capacity, conceptual clarity, and cognitive flexibility.

The present research will address these issues in a very preliminary manner, investigating the extent to which subjects' reported level of perceived characteristics related to parental respect may be associated with differential patterns of both LI and cognitive flexibility, asking the questions: 1) "Is there a significant association between perceived level of parental respect and the expression of LI, as a function of processing load of the masking task?" and: 2) "Are there differences in cognitive flexibility, as measured in the current study, between individuals who perceive that their parents' treatment of them was characterized by high versus low levels of respect?"

Neurochemical Findings for Latent Inhibition

Researchers have made progress in localizing the neurotransmitter effects that are responsible for LI. In summary, pharmacological interventions that produce a hyperdopaminergic state (i.e., administration of dopamine agonists such as d-amphetamine) appear to retard LI, while those which produce dopamine blockade (i.e., use of dopamine antagonists such as most antipsychotic drugs) enhance its expression. Recent research has provided further evidence that LI is accomplished through the interaction of dopaminergic and serotonergic systems (Loskutova, Luk'yanenko, Il'ychenok, 1990a; Loskutova, Luk'yanenko, Il'ychenok, 1990b). Beyond this, researchers have been able to infer some of the specific loci of the neurotransmitter systems involved in LI.

Weiner and Feldon (1997) reviewed evidence regarding neural substrates implicated

in LI in support of the “switching model” (See Weiner, 1990). There is mounting evidence that LI depends on subicular input to the nucleus accumbens (NAC), with implications that pathways projecting to the shell subterritory of the NAC are critical to the expression of LI. Research has uncovered a functional dissociation between the shell and core subterritories of the NAC, with lesions in the shell disrupting LI, while lesions in the core do not, interpreted as meaning that the shell is necessary for the expression of LI, while the core is responsible for its disruption.

While the current study is not directly concerned with neurochemical phenomena, the findings just described are relevant to the research, in that they provide evidence as to the means by which early neurological changes in offspring could be caused by environmental factors such as parental respect. The brain areas proposed to be crucial to both LI and reinforcement processes are components of the limbic system, which is also implicated to have a central role in the expression and regulation of emotion. The hippocampus is thought to be important to memory and learning new information, and it may be critical to the formation and retrieval of emotional memories. Given the neural plasticity of the hippocampus, that is, the extent to which its development may be altered by factors in the neonatal environment, it is important to the current project that this is an area that has been strongly implicated as a central contributor to the expression and disruption of LI.

Further, the nucleus accumbens, whose shell and core territories were just described

as being critical to the expression and disruption of LI respectively, has long been viewed as central to reinforcement-mediated behavior. This is compatible with the view that early thresholds for response to reinforcers and thresholds for switching in accordance with changing contingencies may be to some degree established post-natally in conjunction with characteristics of early environmental contingencies. The quality of early caretaker responsiveness may be important among these influences.

There is direct evidence from microdialytic studies that natural reinforcers increase the release of dopamine in the nucleus accumbens (Phillips, Blaha, and Fibinger, 1989) and the reinforcing effects of natural appetitive stimuli are abolished by the administration of dopamine antagonists (Stellar, Kelly & Corbett, 1983). These findings support the possibility that the presence of UCR's related to attachment such as caregivers and the associated enactment of instrumental attachment behaviors may constitute powerful dopamine releasers. The reinforcement system is activated by feedback that arises from making an appetitive response (e.g., eating, drinking, or mating), a process which strengthens the link between the discriminative stimulus and instrumental response (Carlson, 1991). It follows logically from this view, that if an organism were thwarted in its effort to perform a given species typical behavior, the reinforcing properties of the behavior may be disrupted with unspecified consequences. For example, if a child encounters his or her caregiver, who constitutes a biological releaser for innate attachment-related behaviors, and the caregiver does not respond in a manner that

supports the child's ability to effectively enact that behavioral system, the reinforcement properties of that stimulus situation may be diminished. It is also likely that a compensatory developmental path, which may increase the child's potential for adaptation in this context would ensue.

Because dopamine is central to reinforcement processes, it has been suspected as being directly responsible for at least some of the synaptic changes that affect learning (Carlson, 1991). Stein and Belluzzi (1988) discovered that dopamine can change the response characteristics of single neurons. The researchers found that infusion of both dopamine (and DA agonists) increased bursts of activity from hippocampal pyramidal neurons, but only when they were applied contingently. Carlson (1991) interpreted these findings as indicating "that if dopamine is administered at the time that cells are already firing, their firing rate will increase" (p. 523). The mechanism for this finding is not yet known; however, Carlson (1991) proposed that if this phenomenon involves the strengthening of synaptic connections between neurons on the hippocampal slice; it suggests that dopamine itself can reinforce connections between neurons, which could be a factor that underlies the neural plasticity of this brain area. It also points to the possibility that the contingency of stimulation may be a factor of significance in shaping these malleable brain areas.

Developmental Origins of Latent Inhibition

There is preliminary evidence that early environmental experiences may affect the development of LI in rats. The effects of preweaning stimulation have been the subject of

intensive scrutiny by animal researchers for some time. Handling has been the most extensively used procedure for manipulating young animals (Ellis, Bennet, Daniel & Rickart, 1979). The accumulated findings suggest reduced emotionality in handled animals and an associated increase in these animals' tolerance to stress (Levine, 1956). Levine (1956; Levine, Chevalier, & Korchin, 1956) found that rats handled for the first 20 days of life were significantly better at avoidance learning than nonhandled controls; however, this finding has not always been replicated (Ellis et al., 1979).

Male rats subjected to early handling exhibit a normal LI effect when tested at maturity where nonhandled males fail to develop LI (Weiner, Schnabel, Lubow & Feldon, 1985; Weiner, Feldon & Ziv-Harris, 1987). In a follow-up study, Feldon & Weiner (1988) found that handled male and female rats, as well as nonhandled female rats exhibited normal LI, while nonhandled males failed to show LI. The antipsychotic, dopaminergic antagonist haloperidol was administered subsequently to all rats. Haloperidol enhanced LI in all groups, but this effect was most pronounced in the nonhandled males in which the drug reinstated the LI effect.

Ellenbroek et al. (1995) examined the effects of early maternal separation on the development of LI in rats using the taste aversion paradigm. They based their study on increasing evidence that schizophrenia is a neurodevelopmental disorder, as well as numerous studies that indicate clear neurochemical disturbances in rats as a consequence of early maternal separation. The researchers found that early maternal separation increases

rats' susceptibility to the dopamine agonist apomorphine, as well as a disruption in LI. Ellenbroek et al. (1995) cited accumulating evidence of the importance of intact hippocampal functioning in LI and the fact that this brain structure is especially sensitive to early postnatal manipulations in order to propose that the "early maternal separation paradigm" may be a promising model for studying information processing anomalies in schizophrenia.

These studies appear to fit well with research examining altered patterns of cortisol excretion in children with histories characterized by early environmental adversity (e.g., Flinn & England, 1995) and attachment insecurity (Schieche & Spangler, 1994; Nachmias, Gunnar, Mangelsdorf, Parritz & Buss, 1996), which also may be associated with similar early pathophysiological changes. It appears from these studies that early psychosocial stress, including disruption in parenting and other insults in the early environment, may perpetually change the level and pattern of cortisol excretion, which theoretically could impact other aspects of functioning, such as information processing and style of interaction with environmental stimuli. Research regarding the association between early environmental adversity, altered information processing, and psychopathology in human subjects will be reviewed in a later section.

The Potential Impact of Early Social Contingencies on Subsequent Behavioral and Emotional Adjustment

Maccoby (1992) reviewed the history of research on childhood socialization in the

context of the family, concluding that “simple reinforcement theory was seriously weakened by work on developmental psycholinguistics, attachment, modeling and altruism” (p.16). Specifically cited was the influence of microanalytic analyses of parent-child interactions and the extent to which this research strategy shed light on bidirectional processes in socialization. One could argue, however, that it is a mistake to lose sight of robust elements of information processing and learning that have repeatedly emerged as important in elucidating our understanding of more complex interactional systems. Contingency Perception and Schedules of Reinforcement are behavioral constructs that may be important in early information processing and attachment. The means by which these processes may exert an influence in early development will be discussed in the subsequent sections.

Contingency Perception

Previous Theory and Research

The idea that infants are specially prepared to perceive contingencies in their social environment was first advanced by J.S. Watson (1979) who detailed a theory about how infants perceive the necessity and sufficiency of their actions to effect changes in the social environment. Watson (1979) distinguished between environment-based and behavior-based contingencies. Environment-based contingencies involve events that are external to the individual and do not directly involve his or her behavior, whereas behavior-based contingencies involve the individual’s behavior as the initiating event in a contingency. In

other words, in a behavior-based contingency, the occurrence of the event is dependent on the individual's behavior. In an environment-based contingency, behavior does not impact the ensuing events, but behavior can be organized around such fixed contingencies that are detected (Tarabulsy, Tessier & Kappas, 1996).

Contingency is defined as “the presence of a temporal relationship between the occurrence of two events” (Tarabulsy et al., 1996, p. 26) . In general terms, a contingency is said to exist between two events, A and B, when the probability of the occurrence of Event B, given the previous occurrence of A, is greater than B without A (Moran, Dumas & Symons, 1992; Sackett, 1979; Watson, 1979). The relationship between the two events may or may not be a causal one, given that contingency is a necessary, but not sufficient condition for the inference of causality (Moran, Dumas & Symons, 1992; Sackett, 1987).

Tarabulsy, Tessier and Kappas (1996) present a thorough review of the research to date regarding to Contingency Detection in infants and associated implications for socioemotional development. The authors culminate their exhaustive review of the literature regarding the contingent, behavioral organization of infants in social and nonsocial contexts by delineating four major points that are consistently borne out by the literature:

- (A) Infants are able from a very young age to detect temporal links between environmental events and between their behaviors and environmental consequences. The data support the belief that infants are equipped with a mechanism whose functioning is based on the detection of relations

between events and behaviors, and gears perception and attention in different sensory spheres, toward those stimuli that manifest coherence in their occurrence. This mechanism permits infants to predict and influence the occurrence of events in their immediate environments, thereby having potential motivational and adaptational implications.

- (B) A highly related, if not the same, mechanism is involved in the manner in which infants organize their social behavior with their primary caregiver, and possibly with other adults.
- (C) In both social and nonsocial domains, contingent behavioral organization is highly correlated with specific affective manifestations— positive affect in the presence of contingency, or as the infant is learning the contingency, and negative affect when this contingency is violated. The connection of behavior, cognition and affect enforces the notion that the Contingency Detection mechanism possesses potential as a motivational and adaptational construct, providing a process by which the infant and environment transact and leading to representations of the external world based on the predictability of social and nonsocial events and on the perception of control that the infant is able to exert over some of these.
- (D) Infants are sensitive to both the temporal aspects of the contingency and to the attributes of the stimuli involved, although the manner in which the two elements interact is relatively understudied.

(From Tarabulsky, Tessier & Kappas, 1997, p. 39)

From Being Controlled and Controlling Others to the Development of Social Reciprocity:

The Special Case of Synchrony Perception in Interpersonal Contingencies

Watson (1979) discussed the ability that infants develop to perceive instances in which their behavior is contingently coordinated with that of others in the social environment. He suggested that the reason why an infant may be predisposed to detect “synchrony” as a special case of contingency is due to “the very fact that synchrony can be viewed as a balance between the perception of ‘being in control’ and the perception of

‘being controlled.’ ”

When one perceives that one is “being controlled” by the behavior of another ($P_R = fP_S$), then one has information that the other might perceive his control ($P_S = fP_R$), assuming one’s behavior is perceivable, and that would mean he would have evidence that one was perceiving his behavior. When one perceives that one is “in control” of the other’s behavior ($P_S = fP_R$), then one has evidence that the other perceives one’s behavior (if not one’s control) and that the other has information about one’s existence. Now then, when one perceives synchrony, both preceding implications apply, and one has information that the other has information of one’s perception of the other. Thus, the perception of synchrony involves the unique state in which the subject has evidence that he can be perceived as attending by the organism to whom he is attending. In short, perception of synchrony might be special because it implies mutual regard.

Schedules of Reinforcement: Possible Relationship to Attachment Organization

Certainly, we have advanced scientifically to the point that there is no possibility of returning in any form to radical behavioristic views, but to diminish the importance of reinforcement processes and the impact of different schedules of reinforcement even as component processes in complex behavioral systems might be likened to throwing “the baby out with the bath water.” The normative power and maturity of parents and the neural plasticity differential between adults and children makes infants and small children as a rule considerably more susceptible to parental influence inherent in parent-child relationships, than vice versa (Maccoby, 1991). The relatively greater influence of parents on their children presumably exists despite recognition of the extent to which many parental behaviors are automatic, likely to a great degree governed by unconscious processes, and reciprocal, that is, occurring in response to child behaviors.

Bidirectional influence coincides with, rather than contraindicates, multiple levels and kinds of influence, the effect of which may be assessed in part by alternatively focusing on each party in the interaction independently. In other words, even given undoubtedly complex, reciprocally determined behavior in parent-child interactions, over time each member of a two-way interaction may be acting in ways that represent for the other a given schedule of reinforcement, the effect of which can be assessed independently of the other's contribution to that pattern. In this case, the admittedly important role of children in shaping parents' behavior (e.g., Gonzalez, 1996) can be given less attention.

The subsequent behavioral formulation of attachment does not intend to conflict with Bowlby's (1960) description of attachment systems as outgrowths of species-specific behavioral repertoires; rather it focuses on the elemental behavioral processes which may influence the thresholds of activation and overall mode of operation of these cybernetic systems. Important for the current formulation is the assumption that at birth, the primary caretaker, often the mother, is a powerful UCR to the human infant. She theoretically is imbued with powerfully positive reinforcing properties and is a potent elicitor of biologically determined, instinctive behavior patterns. This is consistent with Bowlby's (1960) formulation; although he doesn't refer to the mother or primary caretaker as a UCR per se, this certainly is implied.

With the mother initially serving as a potent UCR, the several styles of attachment described previously could be viewed in an over-simplified way as predictable outgrowths

of well-substantiated schedules of reinforcement. The robustness of these schedules of reinforcement is attested to, albeit circularly, by their long history of emerging as stable and significant predictors of behavioral responses across diverse organisms. The significance of schedules of reinforcement as a heuristic in examining attachment could be studied empirically, first by assessing the extent to which each strategy represents stability (maintenance), acceleration (reinforcement), or reduction (extinction through nonreinforcement, or punishment) in attachment-related behaviors, and then by more closely examining the qualities of the behavioral pattern.

First, it could be argued that secure attachment behavior is the result of relatively continuous predictable reinforcement for attachment-related overtures early in life, coinciding with Ainsworth's concept of caregivers' "contingent response;" presumably, the schedule becomes somewhat more intermittent with time, but remains predictably and appropriately so as a child becomes increasingly independent.

To the extent that parent(s) provide unconditional positive reinforcement for the child through the qualities of their presence and adequate levels of sensitive stimulation that are not always directly predicated on the infant's behavior, the child learns about the contingencies of the environment within a larger context of noncontingent stimulation. This may increase the infant's ability to explore the environment and willingness to experiment with various behaviors and stimuli due to the "recognition" that sufficient reinforcement is forthcoming regardless of his or her behavior, consistent with Bowlby's

contention that infants will feel greater exploratory freedom, given a “secure base”. According to a substantial body of research already reviewed, this results in a coherent, well-integrated pattern of behavior with regard to attachment and contributes to positive cognitive, emotional and social adaptation in childhood, continuing on to adulthood.

As reinforcement for attachment-related overtures becomes more intermittent with the child’s increasing autonomy, the secure child utilizes developing cognitive skills to form a secure working model of the relationship, which becomes a reliable alternative to the primary attachment figure during times of exploration, separation and at other periods of stress (Bowlby, 1982). Working models of attachment are analogous to “internalized objects” in object relations theory; they are cognitive representations of key attachment relationships, which are substantially stable and influential in shaping the course of interpersonal relationships throughout development. Clear self-other boundaries would be established over time due to the infant’s perceiving predictable cause and effect relationships between his or her behavior and the response from the environment, allowing clear delineation of where he or she stops and the environment, including key attachment figures, begins.

Tolerance for frustrative nonreward then would develop due to appropriate exposure to challenge within this secure, supportive context. Consequently, greater experience with the unconditionally reinforcing properties of the parent would be accrued over time, along with sufficiently consistent instrumental contingencies to allow the child

to gain frequent and accumulating experience of cause and effect between his or her behavior and the social and physical environment. Punishment and frustrative nonreward, resulting in some degree of extinction, would inevitably and quite naturally characterize any environment to varying degrees, for example, due to periodic absence of primary attachment figure, as well as the frustration inherent in exploration and problem-solving. This would be experienced in the context of increasing evidence of environmental security, support, and capability for achieving predictable influence and response and presumably would result in greater persistence in learning and exploration even in the face of nonreward.

Consistent with the accumulating research previously reviewed (e.g., Raver, 1996), this constellation of circumstances would be expected to result in sound emotional regulation during the process of exploration. This style of early parental conditioning in social relationships would be associated with a predominantly positive emotional tone and minimal tendencies to engage in avoidance or dissociative responses to social situations. Dissociative behavior is defined in the current paper as a cognitive process involving the defensive exclusion of, or disconnection from fully perceiving, environmental stimuli. In this view, dissociation is a protective process that may result from, and prevent, psychological overload and injury.

Conceptualizing the infants' mother, at least initially, as a powerful UCR, various genetic and environmental factors could operate to reduce or disrupt the infants' early

experience of these qualities. The current formulation focuses on several possibilities for disruptions in the infant's early social environment. Physical or psychological separation from the mother, including behavioral correlates of maternal psychopathology, such as alterations in mother-child attention, motherese, and maternal emotional dysregulation could result in considerable conflict for the infant as he or she simultaneously experiences the powerful prewired "expectation" for attachment-related stimulation, and encounters nonreinforcement, punishment, or both, accompanied by the aversiveness of extinction.

The child's anxious-resistant and anxious-ambivalent, or what in an adult may become "preoccupied," attachment, could be viewed as conflicted, approach-avoidant behavior that is brought about by unreliable, intermittent reinforcement interspersed with punishment, with reinforcement and punishment sometimes occurring at different times, or even simultaneously for the same attachment-related behaviors. This may be related to so-called "double-binding" behavior (e.g., Gootnick, 1973). These attachment patterns would be likely to be associated with considerable fluctuation in the caregiver's responses to the child's attachment-related overtures. Over time, quite reinforcing responses may be interspersed with inconsistently predictable punishing responses, ranging in degree from moderate to extreme.

This type of parental response pattern would be likely to leave a child conflicted and confused, but still responding due to his or her intermittently being reinforced; this is similar to a "preoccupied" adult's behavior, which exhibits the resistance to extinction

commonly associated with intermittent reinforcement (Bijou, 1957). Individuals in this classification sometimes continue to expend considerable cognitive and sometimes instrumental effort in the interest of attachment, appearing as though the extreme conflict they experienced as a child compels them to continue trying to “figure out,” “master,” and “conquer” relationships, often with little success.

Continuing with this analysis of parental behavior, extinction periods would correspond to intermittent neglect, which could be associated with extinction-induced aggression and anger, as has been observed in animals and humans. This is consistent with the anger displayed by children with resistant and ambivalent attachment strategies in response to reunions with the caregiver during the Strange Situation procedure. This pattern of early social conditioning would be associated with a high level of negative emotion, particularly frustration and conflict. Excessive and unproductive preoccupation with social stimuli and situations may alternate with periods of withdrawal, disorganization, and mild dissociation.

Avoidant attachment strategies in children and the associated, dismissing and fearful patterns in adults represent strategies that appear to be extinction or punishment-mediated, specifically related to punishment associated with an opportunity to escape through some instrumental behaviors on the part of the child. While, intuitively, it seems likely that biologically significant behaviors would be more resistant to suppression by punishment than others, actually the opposite is true (Ellis, Bennett, Daniel, & Rickert, 1979). In

fact, the most devastating effects of punishment occur when it is applied to consummatory responses (Beach, Conovitz, Steinberg & Goldstein, 1956 as cited in Ellis, Bennett, Daniel, & Rickert, 1979). If, as Bowlby proposes, attachment behavior is as fundamental a biologically significant behavior as the need for food and sex, and if the primary caregiver may aptly be viewed as a potent UCR, it should follow that punishment would have a similar suppressive impact on attachment behavior. Mild punishment should be associated with a resurgence of behavior following cessation of the aversive stimulus, whereas more intense punishment should be associated with a longer duration of suppression (Masserman, 1967).

Avoidant attachment patterns represent relatively stable strategies that suggest resignation to negative responses or nonresponse on the part of the caregiver following attachment-related overtures. Children in infant subgroup A1 who exhibit more “purely” avoidant behavior, and the adults with the corresponding “dismissing” style, may have developed this pattern in response to consistently negative or absent (neglectful) response on the part of the caregiver; this perhaps enables the child to develop a consistent and less consciously conflicted pattern of avoidance, given the predictable negativity or absence of the caregiver. This predictability may allow for an enhanced sense of control that preserves the individual’s self-concept with advancing development, consistent with Bartholomew and Horowitz’ (1991) conception of the individual with a dismissing attachment style, who has a negative view of others but maintains a positive view of self.

This attachment strategy may be associated with less conflict-mediated anxiety, and theoretically would consume less conscious processing capacity; it thus may be associated with less disruption in attention and concept manipulation.

Early social-emotional conditioning in the “pure” avoidance group would be likely to have been either negative or absent due to failure to connect in a meaningful way or to effectively synchronize behavior and emotions with an attachment figure, followed by a defensive exclusion of emotion, possibly associated with flat affect. This pattern of attachment may be associated with deficient empathy in the child, due to the absence of affective alignment with the caregiver, but possibly exemplary perspective-taking, developed out of these individuals’ distant study of others; such behavior is seen in some individuals with antisocial personalities who exhibit a cold, astute objectivity with regard to others’ dynamics that is often used in the interest of manipulation and exploitation.

In contrast, the person who is subjected to more unpredictability on the part of the parent, where there is a preponderance of negativity, punishment and neglect, interspersed with infrequent positive responses of low to moderate reinforcement value, could develop an attachment style which is characterized by greater anxiety and relatively greater conscious preoccupation with the caregiver and with the process of social avoidance. The resulting attachment style could be analogous to Ainsworth’s infants’ attachment subgroup A2, where there is a mixed response to the caregiver, with some tendency to approach the caregiver at reunion. This subgroup could be termed ‘ambivalent-avoidant’,

in that the primary overall strategy is avoidance, but its behavior appears to be accompanied by more conflict than the behavior of subgroup A1 and may be associated with greater anxiety and social preoccupation with advancing development, similar to the behavior of subjects in Bartholomew and Horowitz' "fearful" classification.

Individuals with a fearful attachment organization have a negative view of others and a negative self-concept. Unlike the case of "pure" avoidance, in which the predictability of the environment may contribute to a sense of control, in the case of fearful attachment, the extreme inconsistency and unpredictability of the attachment figure, coupled with predominantly negative feedback, is likely to result in diminished sense of control, hypervigilance, anxiety, and a degraded self-concept. Furthermore, a socially avoidant strategy, coupled with a negative self-schema, allows little opportunity for the collection of schema-contradictory evidence, which would be frequently dismissed anyway due to assimilation being the path of least resistance. This coincides with portions of cognitive formulations of depression (e.g., Beck, 1964). Early social-emotional conditioning in ambivalent-avoidant children would be negative, marked by conflict-mediated anxiety.

Disorganized-disoriented attachment behavior may result from severe inescapable punishment, most likely in the context of extreme inconsistency in reinforcement contingencies and a low level of positive reinforcement. Transient early infant experience of the powerful unconditionally reinforcing properties of the primary attachment figure may increase the impact of severe punishment or abuse that is experienced in this context.

The behaviors of children in this category resemble those of an animal in a learned-helplessness paradigm. Because their behavior does not impact their ability to avoid further adversity, these children exhibit passive or idiosyncratic patterns of behavior, with no clear strategy in reference to the caregiver. Early social-emotional conditioning would be for pronounced fear and anxiety, possibly to the point of encouraging dissociation in social situations. Dissociation, as defined previously, may be a noninstrumental route to escaping the excessive stress. This is also consistent with learned avoidance models for schizophrenia.

Theoretical Cause-and-Effect-Seeking Tendencies in Early Human Development:

Some Possible Implications

This formulation is predicated on the notion that from the earliest moments of life, humans and other organisms are attempting to achieve a cause and effect relationship with their environment (Watson, 1979). Schedules of reinforcement constitute contingencies, and it is argued that a certain level of predictability, as well as certain qualities of contingencies in an infant's early environment may be necessary to establish accurate systems for the detection of cause and effect in a reasonably stable environment.

For humans, the earliest and most important cause and effect relationships occur in a social context. Communication between infant and mother, father, or other caretaker, ensues at their first meeting through tactile, auditory and soon, visual modalities. Through contingency between the infants' most subtle overtures and the parent's response, the

infant optimally develops awareness of the multitude of stimuli he or she begins to encounter. Despite variations in hedonic balance that occur as a result of the infant's various interactions with his or her caretakers, contingency experiences are believed to constitute a powerful organizing influence on infant cognitive development and behavior (Watson, 1979).

Given the existence of biological predispositions that typically cause the very presence of the mother initially to be an unconditional reinforcer, experiences within the context of this relationship are ripe to cause either harmony or conflict. If these reinforcing maternal qualities are diminished, as could occur in conjunction with separation from the mother, or with certain types of maternal psychopathology, and the infant's first attempts at causing reactions in this environment go unreciprocated, unpredictably reciprocated, punished, or are otherwise associated with aversiveness, the infant's perception of the environment and the associated contingencies may begin to be compromised. This may initially result from the action of biological mechanisms that ensue to compensate, perhaps, such as aberrant patterns of LI, inaccurate perception of contingency and through psychological defensive processes, such as dissociation. Subsequently, the beginnings of faulty development of the self, as well as either indistinct or overly rigid self-other boundaries likely would appear.

In this context, the admittedly over-simplified heuristic just provided in accordance with schedules of reinforcement may be helpful. This formulation is consistent with child

development researchers' and clinicians' ever increasing emphasis on the caretaker attentiveness and stimulation that is required to care for an infant to encourage healthy development, with the current view placing emphasis on Ainsworth's concept of "contingent" or sensitive responsiveness, which is characterized by attention and nurturing, yet is respectful of the child's individuality and emerging autonomy.

In a worst case scenario, if an infant's first and possibly most critical interactions with the environment are met with nonreinforcement, intrusion, or abuse, either due to qualities inherent in the attachment figure, by the infant's particular response, or both, the powerful, prewired "expectation" for attachment would be violated. Theoretically, this could be experienced as a significant early trauma, in that the infant has failed in his or her first attempts at instrumental impact on the environment. This failure may have rather permanent consequences, not necessarily because corrective action from the environment would not alleviate the problem, but possibly due to the fact that as infants become increasingly out of synchrony with their environment due to compensatory neurological and behavioral mechanisms, they become increasingly less able to elicit appropriate responses, especially from the most available individuals who may have been unable to provide those initially.

As an example, if you push a tall lamp, you expect it to fall over. If it doesn't and you continue to want it to fall, you likely will adjust and try again. After repeated unsuccessful attempts, even though you've pushed over many lamps before, you may

begin to lose faith in your perceptual apparatuses and motor skills. If your inability to impact this lamp continues and perhaps generalizes to other things, you may begin to doubt the existence of lamps and other objects in the environment. You may even begin to question your own identity in this unmanipulable context. How might the infant, who has no such accumulated experience respond to analogous circumstances in his or her early social world, which is infinitely more complex than the physical world in the example just described?

The infant may respond by miscalculating the potential impact he or she can have on his environment either by over or underestimation, as well as possibly failing to establish the earliest underpinnings of his identity. As can be derived from Piagetian principles (e.g., Cowan, 1978), perception doesn't become "real" without the associated experience of cause and effect based on those perceptions. Cognitive development will not proceed successfully without those experiences. This formulation places emphasis on the feedback component of the goal-corrected behavioral system of attachment. It reiterates the extreme importance of Ainsworth's "sensitive-responsiveness" and Winnicott's "good-enough" parenting, but couches these phenomena in somewhat more parsimonious behavioral terms. The present paper joins many others in asserting that consistent attentiveness to the infants' earliest signals, that is, a nearly continuous schedule of reinforcement in response to the infant's efforts to communicate with the social environment, as well as sensitively applied noncontingent reinforcement, are both central

to the development of secure attachment, with more intermittent response being not just tolerated by the infant, but required with the increasing independence that comes with advancing development.

Theoretically, this pattern of parental response will result in the maintenance and further accumulation of UCR properties of primary caretakers, which would be expected to enhance the child's sense of security, encourage sound social and emotional development, and progressively increase his or her ability to elicit positive social responses. Tolerance for the frustration inherent in learning would develop as the parents expose the child to appropriate challenges and nonreinforcement within a nurturing, nourishing, and protective context comprised of adequate amounts of noncontingent reinforcing stimulation, consistency, security and opportunities for emotional synchrony with significant attachment figures.

One might ask what a unidirectional behavioral perspective adds to the increasingly intricate understanding of attachment processes, emphasizing reciprocal processes, that has been achieved by attachment researchers. It may help to simplify the construction of interventions to prevent and address attachment problems, and it may lend optimism, in that this formulation suggests more possibility that even parents with a history of maltreatment could be educated to be "good-enough" parents. This simple model is based on teachable patterns of behavior, rather than underlying intrapsychic processes or cascading bidirectional sequences of interactions that seem nearly magical in their

complexity, not to mention difficult for insecurely attached parents to orchestrate with any degree of success.

This is not to say that the optimal interaction between parent and child would not also be something that is grounded in the security and emotional harmony of the parents, due to their own history of sensitive parenting. However, this model does suggest that if sufficient support could be given to parents to provide consistent, contingent response to their baby's communication, as well as sensitive, noncontingent stimulation, the trajectory of increasingly intrusive, controlling and inconsistent interactions that are the most common outgrowth of behavior problems might be averted by preventing the attachment problems that underlie the progressive escalation of many of these problems.

It should be emphasized that this is in no way intended to be a "parent-blaming model," yet it does not underemphasize the power parents have to respond to their children in resiliency-enhancing ways, irrespective of the child's particular temperament, developmental anomalies, or patterns of behavior. This is not to say that resiliency-enhancing parenting in certain situations isn't exceedingly difficult or nearly impossible to maintain for a variety of plausible reasons; it just suggests that where it is possible, it is potentially quite powerful in maximizing a child's capacity for successful adaptation, regardless of his or her weaknesses, and whatever his or her own personal "bests" might be.

There appears to be considerable hesitation on the part of theoreticians and

researchers to propose models that focus directly on parental influence as an etiological factor that may confer substantial risk or resilience for the development of psychopathology, for reasons that probably go back to the days when extreme and pejorative notions like “schizophrenogenesis” and the “refrigerator mother” were advanced as key etiological factors in the development of schizophrenia. In spite of this unfortunate history, however “politically incorrect” it may be seem, the current paper defers to substantial and rapidly accumulating empirical evidence to directly state that parents have the power to confer substantial resiliency or risk on their children through their response to them, regardless of factors specific to the child.

Early intervention has been consistently advocated by the majority of child development experts for a number of years, but has equally frequently failed to be supported in favor of a medical model approach to addressing the ever-increasing pathology that has resulted from failure to engage in prevention. The current formulation follows many others in emphasizing the crucial need for primary prevention to increase empirically substantiated factors of resilience in early development, which will cost more now, but could more than pay for itself in healthier children for years to come.

Noncontingent Positive Reinforcement: Possibly the Infant’s Most Reliable Indicator of Parental Support and Environmental Security

An indicator of environmental support that could be at least as important as the detection of stability, reciprocity, and synchrony of contingencies, is the extent to which

an infant detects that reinforcement is being provided noncontingently. Carefully considered, noncontingent reinforcement goes beyond social reciprocity and synchrony in its implication of Unconditional Positive Regard (Rogers, 1980). While social reciprocity implies mutual care, detecting an environment characterized by mutual care may not convey sufficient support to a human infant. Rather, detecting that one is cared for by individuals who are providing stimulation that is reinforcing even when one doesn't elicit it with any certain constellations of behavior may "reassure" the infant that he or she has been born into an environment in which dependency is reasonably safe. It is possible that noncontingent positive reinforcement shares considerable covariance with the construct of "parental warmth" which has emerged as a significant factor in assessments of perceptions of parental bonding (e.g., using the PBI), but has otherwise been somewhat difficult to operationalize (e.g., MacDonald, 1992). Higher levels of noncontingent reinforcement might be expected from parents who are more psychologically stable, in that these parents may be able to more freely provide for their child's needs, even when the child is engaging in behaviors that either are not particularly reinforcing, or outright upsetting to the parent.

Noncontingent reinforcement is by definition nonintrusive. While acknowledging the circularity of reasoning that characterizes this and other aspects of behavioral theory, the stimulation would not be reinforcing if it were intrusive. Instead, the stimulation would be felt by the child as punitive and thus would decrease the probability of the child behavior that preceded the parental response. Consequently, parents' ability to provide

noncontingent reinforcement is similar to contingent responsiveness in its dependence on some degree of parental sensitivity and attentiveness to the infants' signals. If parents are able to maintain a stance of sufficient sensitivity and protect the infant from harm or excessive aversiveness, the inherently reinforcing qualities of their presence to the infant should be preserved.

This view is consistent with recent literature in the area of applied behavioral analysis which cites evidence that noncontingent reinforcement provides effective treatment for severe behavior disorders, particularly in combination with extinction (Lalli, Casey & Kates, 1997; Marcus & Vollmer, 1996; Sprague, Holland & Thomas, 1997; Vollmer, Iwata, Zarcone, Smith, & Mazaleski, 1996). This treatment is made more effective when controls against the incidental reinforcement of the behaviors targeted for elimination are implemented (Vollmer, Ringdahl, Roane & Marcus, 1997).

In fact, it may be the combination of noncontingent reinforcement (or, minimally, preservation of the unconditionally reinforcing properties of social stimuli), extinction, and predictable contingencies that confer optimal stress resilience. As has been discussed previously, there is evidence that infants who are allowed the opportunity to experience developmentally appropriate levels of stress and frustration in a supportive, but nonintrusive environment emerge with more effective coping skills, higher levels of tolerance for frustration, and abilities to defer gratification, which combine to result in enhanced self-control and generally healthier, more productive interactions with the

physical and social environment.

Effects of Parental Respect for Child: Summary and Conclusions

There is increasing neurobiological evidence for critical periods of neural plasticity in human development, during which neonatal neural development is impacted by interaction with the physical and social environment (e.g., Ellenbroek et al., 1995). One such early critical period may be one during which neural development can be impacted negatively by extreme inconsistency of social contingencies, extremely asynchronous, out of touch with the infant, responses from key attachment figures, or absence of contingency mediated by physical or emotional separation from primary caregivers (Shaw & Vondra, 1995). Early social contingency may be necessary for establishment of the underpinnings of normal attentional processes, as well as for development of the capacity to assess accurately behavior-based contingencies.

Latent Inhibition is a possible example of such an attentional process. LI confers a useful adaptation to an environment characterized by some degree of stability, consistency and security, an environment which presumably is most often achieved for the infant through sensitive caretaking. Detecting what is most salient in a stable environment makes good adaptive sense, as it allows for more systematic interaction with the objects and people in that environment. A neural mechanism may have evolved that provides an alternative attentional strategy in the event that an infant detects through interaction with his or her early social environment that security may best be achieved by a cognitive style

that is less assured of environmental safety and stability.

This alternative style may consist of being attentive to aspects of the environment that previously did not present themselves as important. This style would not favor detecting regularities; rather, it would favor processing stimuli that as yet have no demonstrated relevance: The reason for this is that in this unpredictable environment, these stimuli potentially represent critical and survival-relevant information. Consequently, it is predicted that individuals with this latter attentional style would be reinforced by novelty. This style would include elements of attentional vigilance, but would not consist of a vigilance toward detecting particular targets, but rather a less selective vigilance. For individuals with this processing attribute, the universe of stimuli may be more equisalient, or equipotent (to inspire a response), until they are unequivocally proven relevant through repeated reinforcement, at which point schemata developed in conjunction with relevant stimuli might become excessively rigid and resistant to accommodating new information.

Associated with deficient LI, individuals reared in such a noncontingent environment may be expected to exhibit impaired ability to assess cause and effect in their interactions with the environment. This impaired Contingency Perception might arise from defensive processes that reduce awareness of noncontingency, which has been experienced as aversive because of inadequate levels of early contingent stimulation. Impaired Contingency Perception could also result from overly intrusive or abusive caretaker-child

interactions, which may be sufficiently aversive that they encourage defensive responses in the child, such as dissociation, that operate to reduce awareness of distressing stimuli.

Both impaired LI and impaired Contingency Perception may help to preserve an individual's motivation in the face of a noncontingent or inconsistent environment by insulating him or her from the unpleasant emotions associated with noncontingency, which may at least partially stem from the aversiveness of being in a perpetual state of extinction. In other words, these two phenomena may be components of an evolved mechanism that increases motivation and chance for survival in an unstable environment, combating learned helplessness and depression, which might otherwise ensue.

Because extracting, retaining and retrieving regularities from the universe of stimuli to which one is exposed is at the basis of inductive reasoning and abstraction, an attentional style that renders physical and social stimuli more equisalient or equipotent could hinder conceptual development and facility in both the physical and social realms, despite its advantages in certain environments, mentioned above. The absence of a "secure base" from which to explore would further limit attentional resources to be allocated to experiential learning. The child's reduced ability to selectively attend to more relevant stimuli combined with insecurity could hamper social skill development, communication, and negotiation of tasks in the physical environment.

The child's vigilant, defensive stance would reduce the opportunity for affective alignment with the caregiver due to the vulnerability that this would entail. As described

previously, the deficiencies in regulating emotional processes that insecurely attached children exhibit while engaged in problem-solving, such as poor tolerance for frustration and the associated lack of persistence, would be expected to exacerbate these difficulties. Consequently, this attentional style might be associated with a lessened capacity for empathy, as well as a reduced threshold for the expression of anger and aggression.

An impulsive pattern of responding to stimuli may prevail, both covertly (in thought) and overtly (in action). This could contribute to an individual's becoming increasingly out of synchrony with his or her environment, eventually resulting in diminished acceptance by others and lowered self-esteem. Such a decrement in self-esteem could also be exacerbated by the previously described impairment in conceptual development, which would result in poor achievement and frequent frustration. The individual may respond by developing alternative strategies to achieve social acceptance and instrumental success, such as gaining social attention and a sense of "cause and effect" through capitalizing on impulsive behavior to orchestrate predictable negative contingencies (externalizing behavior pattern), or withdrawing from social and physical challenges (internalizing behavior pattern). Frustration and anger will have a low threshold for expression, due to these children being in a constant state of high Need for Contingency. This may be associated with a pronounced inability to engage in self-soothing, self-guiding, self-controlling behaviors, including controlled modulation and sustaining of attention. These children's ability to defer gratification through covert, interim self-reinforcement to

actualize a plan or goal would be deficient or absent.

In the case of “respectful” early parenting, during critical early periods of neural plasticity, contingency in the form of relatively continuous, sensitive reinforcement for infants’ attachment-related overtures establishes the optimal threshold for accurate assessment of environmental contingencies, setting the stage for effective exploration and learning; sound “Contingency Detection” is established. Relatively continuous, predictable reinforcement in the child’s early environment impacts neural development in a way that prepares him or her to learn optimally about these regularities; an optimal threshold for the detection of irregularities is established. At the most fundamental level, all learning probably can be reduced to a binary process of extinguishing irrelevant alternatives; thus, tolerating the experience of extinction is key to effective problem-solving.

For children reared in a “respectful” environment, extinction in the form of reduced attention to aspects of the environment that are not reinforced may proceed rapidly to facilitate learning about the regularities of the environment, due to the child’s “assumption,” made on the basis of early social interactions, that it is likely that the environment will remain stable. In this context, Latent Inhibition will be more likely to remain intact, representing an “automatic” form of extinction: Those stimuli that are not demonstrated to be significant will lose their power to inspire a response in order to maximize the child’s responsiveness to stimuli that have proven important. This

conservative orienting strategy allows the child's information-processing system effectively to weed out the "chaff" in the environment's stimulus array to maximize the effectiveness of his or her interaction with the environment. Intact LI may allow fine-tuning of the child's already well-orchestrated communication and interaction with key caregivers, which would result in its being increasingly synchronized and reinforcing for both the infants and parents.

Because the interactional style that characterizes the parents' response to the infant's overtures is "respectful" of the child's boundaries, as described above, the infant will not feel threatened, thus will construct and enact fewer psychological defenses as barriers to social perception; he or she will be more able to join affectively with the parent to learn about the physical and social environment and its associated emotional connotations in an efficient way.

This should set the stage for the child to develop accurate empathy and sound emotional regulation. The child will develop a "secure base" (Bowlby, 1988) from which to venture forth in exploration of his or her environment, looking to parent's "mirroring" reaction to stimuli for information and validation (See Kohut, 1968); this will facilitate learning and security with the process of learning. Attention will not be "tied to the base," so to speak, in that psychological defensive strategies and their associated reduction in perception will not consume conscious processing capacity; this will free up working memory capacity to allow for the refinement and fluid interaction of schemata-driven and

data-driven cognitive processing strategies. The development of schemata and concepts, along with an ability to engage effectively in deductive reasoning, will be supported by the child's neurological makeup, which is geared for learning about patterns and regularities in his or her reasonably stable environment. When unfamiliar circumstances present themselves, the child will feel sufficiently secure to pay attention to the novel stimuli to learn about their possible relevance, rather than place too much emphasis on defending against their possible threat.

Frustration that occurs as a consequence of nonreward will occur throughout the learning process if the parental stance is one of "respect" and nonintrusion. This allows the child freedom of exploration and exposure to learning experiences as becomes appropriate with his or her advancing development. Frustration within an environment of respect is viewed as critical for the experience of "coping" to occur and for sound development of the HPA axis and optimal excretion of cortisol. (Schieche & Spangler, 1994; Nachmias, Gunnar, Mangelsdorf, Parritz & Buss, 1996; Flinn & England, 1995). These experiences of frustration within a supportive, respectful context will inoculate the child against the stress of frustrative-nonreward and allow the child to persist in the face of the frustration that is inherent in problem-solving. This will have a profound, positive impact on the child's ability to negotiate tasks in the physical and social environment, and will further buttress his or her ability accurately to assess contingencies. The mechanism for frustration tolerance just described is proposed to be the "glue" that allows the child to

sustain attention to ongoing, goal-directed activities. In processing information about the environment, the child will develop a capacity to fluidly shift between cognitive structures based on previous experiences and the data encountered in the immediate environment.

Viewed from an attachment, object-relations, or neurocognitive information-processing perspective, the child's activity during this period results in the internalization of a benevolent, self-guiding, working model of significant others in his or her environment, something that will increase symbolic representation proficiency in both social and nonsocial information-processing situations and constitute the life-long internal voice that provides commentary, guidance, and support through the challenges he or she encounters in the environment. In this scenario, self-talk and its associated affective tone will be positive, supportive and encouraging. Over time, this will presumably result in confidence, persistence, optimism and decreasing reliance on others for support.

Such fluid interaction with stimuli in the environment will make the child's perspective of himself and the physical and social environment maximally "reality-based." His or her contours, or identity, will become increasingly distinct through these "cause and effect" interactions with the physical and social environment. Clear boundaries between self and others, as well as between self and the environment will be established to allow healthy intimacy and reciprocity in interpersonal relationships, as well as to maximize behavioral effectiveness in the physical and cognitive realms. In terms consistent with Bowenian family systems theory (Bowen, 1974), the respected child will develop a progressively resilient

behavioral “immune system” due to his or her ability to experience healthy intimacy and individuality conjointly in relationships with family and friends:

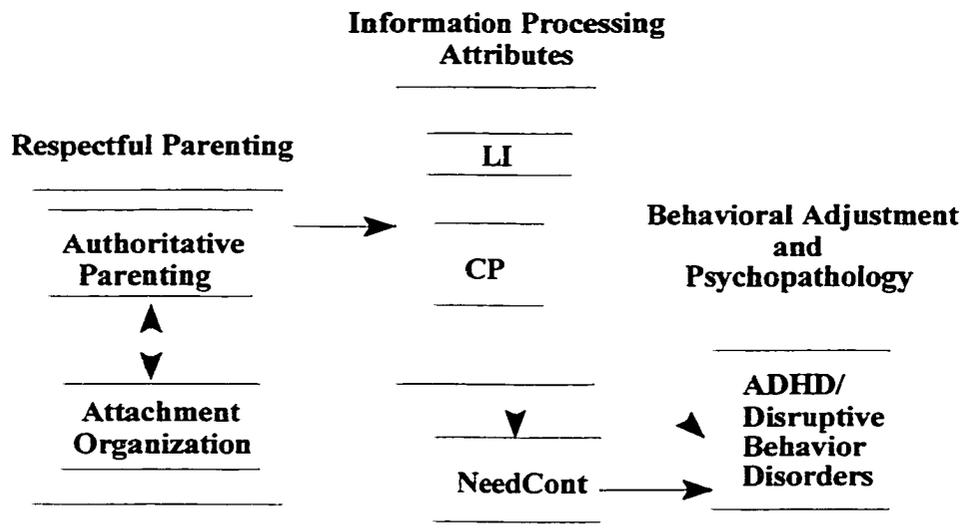
...It was known that creatures of the same species that do not have immune systems will fuse upon contact and become one organism since the immune system is basically the capacity to distinguish self from non-self. Indeed, without immunologic systems, there would be no existential category of self (Thomas, 1974). We need them not only to ward off enemies, but also to love, that is, touch. The other side of transplant rejection is the capacity for self-differentiation. In this experiment, what was observed was that at a certain distance, the smaller organism began to disintegrate and within twenty-four hours had lost the principles of its organization completely. Careful controls proved that the larger one had done nothing to do the other in, either through the secretion of substances or through any form of frontal attack. The disintegration of the smaller organism was purely the result of its own metabolic mechanisms functioning reactively to the proximity of the other. The experimenters had “induced auto-destruction” by moving the creatures closer to a member of their own species. While one might be tempted to blame the larger for not giving its partner enough distance, that misses the most important dimension of this (emotional) phenomenon. Had the disintegrating partner been able to develop more capacity to discriminate self from non-self (worked on its own vulnerability to the other), it might have been able to tolerate more proximity. (Friedman in Gurman, & Kniskern, 1991, p. 156)

This study examines a number of variables in two groups of young adults in an effort to gain evidence regarding whether aspects of information processing, orientation to the environment and certain types of psychopathology may be outgrowths of the level of parental respect subjects experienced in early childhood. Subjects were grouped in accordance with a retrospective self-report of their parents’ style of parenting, as well as their self-reported style of attachment, yielding two groups: 1) high in authoritative parenting and securely attached (“High Respect Group”); and 2) low in authoritative parenting and insecurely attached (“Low Respect Group”). The outcome measures were

administered and analyzed in accordance with group membership to determine the extent to which high versus low levels of retrospectively assessed early parental respect are correlated with differential functioning in these areas when measured in young adulthood.

While an actual path analysis was not conducted, a path diagram follows in Figure 4 to help clarify proposed relationships between key constructs.

Figure 4
Path Diagram Depicting Hypothesized Relationships Between Variables



Synopsis of Research Design and Predictions

Based on the theory and research previously described, individuals reared in environments characterized by high levels of parental respect were predicted to exhibit patterns of LI and CP consistent with a more efficient information processing style, a more internally guided mode of interaction with the environment and better behavioral adjustment than individuals who experienced low levels of early parental respect.

Individuals who experienced low levels of early parental respect were predicted to perform on LI and CP tasks in a manner consistent with less efficient information processing. Individuals who experienced low levels of early respect were predicted to respond to the CP task and the Barkley Adult ADHD scale in a manner that suggested tendencies to preferentially engage in cause and effect seeking behaviors, even in situations where it is not advantageous to do so; this was proposed to function as a defense against feelings of dyscontrol.

The current study gathered preliminary data regarding these predictions. Subjects were administered a retrospective assessment of their perceptions regarding how they were parented and a brief self-endorsement of their attachment security based on the belief that these may be reliable indicators of level of early environmental respect; subjects were assigned to two groups on this basis. Individuals high in authoritative parenting who endorsed secure attachment constituted the “high respect” (HR) group; individuals low in authoritative parenting who endorsed insecure attachment constituted the “low

respect”(LR) group.

All subjects in both groups were administered tests of LI and CP on a computer. To assess behavioral adjustment, the Barkley Adult ADHD Scale was administered during the Screening period.

CHAPTER 3: HYPOTHESES

Labeling Scheme for Hypotheses

Hypotheses are labeled for organizational clarity according to the following scheme: Acronyms are utilized at the beginning of hypothesis labels to indicate within which of the measures the hypothesis is based upon, followed by the hypothesis number. The acronyms are as follows: LI (Latent Inhibition), CP (Contingency Perception), NC (Need for Contingency) and BA (Behavioral Adjustment/ADHD).

A number has been assigned to correspond to each dependent variable (1-10), followed by a lower case letter marking each successive hypothesis regarding that instrument. Subsidiary hypotheses regarding the screening measures can be found at the conclusion of this section. An example of the labeling system follows:

LI1. (Test: Latent Inhibition)

LI1. (Score or measure derived from test)

LI1a. (First subsidiary hypothesis in the series regarding this measure, if there is more than one hypothesis; Otherwise, no lower case number would be indicated.)

Information Processing

General Hypothesis: Overall, superior information processing abilities are predicted in the High Respect (HR) group as compared to the Low Respect group.

Latent Inhibition.

LI1. The HR group is expected to exhibit diminished LI as compared to the LR group.

LI1a. The HR group is predicted to make fewer errors in the masking task phase of the LI task than the LR group.

LI1b. RT's in the masking task phase are expected to be longer for LR subjects as compared to HR subjects.

Contingency Perception.

Accuracy

CP1,CP1a.&1b. Accuracy of Control Estimations on Contiception task (ACE scores) is anticipated to be lower for the LR group than for the HR group. The effect size for this analysis is expected to be small in magnitude.

CP1c.. High causal key contingency judgements (ACE_{high} scores) will be significantly more accurate for LR subjects than low causal key judgements (ACE_{low} scores) for this group.

Mode of Interaction with the Environment

Need for Contingency

NC1. Total number of key presses in the Contingency Perception Test phase will be higher for the LR group than the HR group (as indicated by the Contingency Seeking Preference - CSP Score).

NC1a. The LR group will press more high causal keys than low causal keys as compared to the HR group (as indicated by $CSP_{high/low}$ score).

(It was determined after the study was initiated that this hypotheses actually runs counter

to the research and theory discussed previously, which would predict increased key pressing at lower levels of contingency, due to extinction-induced resurgence in responding; this tendency could be particularly pronounced in the LR group, due to their presumably lower frustration tolerance.)

Behavioral Adjustment.

BA1, 2 & 3. Average scores on the Inattention (BA1) and Hyperactive-Impulsive (BA2) subscales of the Barkley Adult ADHD Scale, as well as the average total score (BA3) will be significantly higher in the LR group than the HR group.

Subsidiary Hypotheses

Screening Data.

Screen₁ Strong correlations between high levels of Authoritative parenting and attachment security are expected, with negative correlations between low Authoritative parenting and attachment insecurity overall, as well as with each of the various subtypes.

Screen_{2, 2a} Similar proportions of the four attachment classifications (2), as well of secure versus insecure subjects (2a) were expected in the present sample.

Screen_{3, 3a, 3b} High levels of authoritarian parenting, particularly reported for mothers are predicted to be significantly positively correlated with attachment insecurity, especially with fearful (3a) and dismissing (3b) subtype measures.

CHAPTER 4: METHODS

Subjects

Subjects in the Screening population were 603 (223 male and 380 female) Introductory Psychology students, ages 18 to 54, participating to obtain required experimental credit. 569 of these subjects (211 male and 358 female) completed all Screening questionnaires administered. Based on a power analysis done prior to data collection, a sample size of 80 or more selected according to screening criteria was targeted as providing sufficient statistical power to test the hypotheses regarding the measures examined in this study. A total of 138 subjects selected from the Screening pool were tested, with 40 subjects lost due to problems with computer hardware and software ($n = 18$), clerical errors ($n = 3$), slight shifts in the Authoritative Parenting total score median over the course of the study ($n = 8$), post-test indications of misunderstanding the task ($n = 2$) and attempts to balance experimental cells ($n = 9$). A final sample size of $N = 88$ was attained with intact data for LI, taking into account the need to balance cells in accordance to test requirements (e.g., PE/NPE condition) and gender; a final sample size of $n = 84$ was attained with intact data for CP. The subjects were systematically eliminated according to the criterion of maximization of level of Authoritative Parenting, that is, in cells requiring reduction, the required number of subjects in the LR group with the highest scores on this measure were eliminated, and for the HR group, the required number of subjects with the lowest scores on this measure were eliminated. A discrepancy of no greater than 60% women to 40% men was achieved in both samples. By testing considerably more than the required number, the experimenter was able to remain blind to

subjects' group membership throughout the period. Please see Appendix A for further information regarding the age and gender composition of the sample.

Measures

Parental Respect: Retrospective Assessment of Parenting Style and Self-Endorsement of Attachment Security

Buri Parental Authority Questionnaire

Subjects completed the Parental Authority Questionnaire (PAQ; Buri, 1991) which consists of two forms, one to describe the subject's perception of the mother's parenting style and a parallel form referring to the fathers. The PAQ is a 30-item self-report questionnaire based on Baumrind's (1971) description of three prototypical parenting styles, permissive, authoritarian, and authoritative; the scale includes ten questions pertaining to each style. Participants respond to each item on a four point Likert-type scale that ranges from *strongly agree* (1) to *strongly disagree* (4). The device yields scores corresponding to each of the three parenting styles.

Scores coded for data analysis in the present study will be Authoritative, Permissive, and Authoritarian Scale Scores from Maternal and Paternal Questionnaires, yielding a total of six scores coded respectively as Maternal Authoritative (MA_t), Maternal Permissive (MPer), Maternal Authoritarian (MA_n), Paternal Authoritative (PA_t), Paternal Permissive (PPer), and Paternal Authoritarian (PA_n).

Norms.

Basic normative information for the PAQ has been gathered by the authors for both groups of both high school ($N=108$; mean age= 17.4) and college students ($N=171$; mean age= 18.8). Both groups were comprised of subjects from intact families.

Reliability.

Test-retest reliability figures for testing that occurred over a two week period ($N=61$; mean age= 19.2 years) are as follows: .81 for mother's permissiveness, .86 for mother's authoritarianism, .78 for mother's authoritativeness, .77 for father's permissiveness, .85 for father's authoritarianism, .92 for father's authoritativeness.

Internal consistency reliability figures ($N=185$; mean age=18.7) based on Cronbach coefficient alpha values for each of the six PAQ scales were as follows: .75 for Mother's Permissiveness, .85 for Mother's Authoritarianism, .82 for Mother's Authoritativeness, .74 for Father's Permissiveness, .87 for Father's Authoritarianism, and .85 for Father's Authoritativeness. Buri (1991) notes that both the test-retest and internal consistency reliability figures are "highly respectable," particularly taking into account that there are only ten items per scale (p. 112).

Validity.

In terms of discriminant validity, the responses of the 127 college student participants in Buri's validation study supported the hypothesized divergence between PAQ scales. Specifically, Mother's authoritarianism was inversely related to mother's

permissiveness ($r = -.38, p < .0005$) and to mother's authoritativeness ($r = -.48, p < .0005$).

Similarly, father's authoritarianism was inversely associated with father's permissiveness ($r = -.50, p < .0005$) and to father's authoritativeness ($r = -.52, p < .0005$). In addition, significant relationships between maternal permissiveness and maternal authoritativeness, or paternal permissiveness and paternal authoritativeness were not found.

With regard to criterion-related validity, consistent with Baumrind's model, it was hypothesized that parental authoritativeness should be positively related to parental nurturance or warmth, authoritarianism should be negatively related to nurturance, and permissiveness should not be significantly associated with nurturance. Consistent with these predictions, when the Buri PAQ was administered along with the 24-item Parental Nurturance Scale (Buri, Misukanis, & Mueller, 1988), the following bivariate correlations between the PAQ scores and the Parental Nurturance Scale scores were obtained: Authoritative parents were found to be highest in parental nurturance for both mothers ($r = .56, p < .0005$) and fathers ($r = .68, p < .0005$); authoritarian parenting was inversely associated with nurturance for both mothers ($r = -.36, p < .0005$) and fathers ($r = -.53, p < .0005$), and parental permissiveness was not related to nurturance for mothers ($r = .04, p < .10$) or fathers ($r = .13, p > .10$). The authors interpreted these results as confirming that "parental warmth is a dimension of parental authority that is inherent in the PAQ measurement" (p. 16).

To check for the possibility that the PAQ may be influenced by a social desirability

bias, the questionnaire was administered in conjunction with the Marlow-Crowne Social Desirability Scale (Crowne & Marlow, 1960). None of the obtained correlations between the PAQ scales and the Marlow-Crowne Scale were statistically significant, suggesting that the PAQ is not vulnerable to social desirability response biases.

Bartholomew and Horowitz Attachment Inventory.

Subjects' attachment style is classified on the basis of Bartholomew and Horowitz's (1991) four category self-report assessment. This assessment of attachment is based on a reformulation of Hazan and Shaver's (1987) attachment measure. Stemming from Bowlby's (1977) suggestion that early attachment experiences are internalized by the child in the form of working models of self and others, Bartholomew (1990) dichotomized the categories of models of self and models of others into a matrix of prototypical adult attachment styles, as discussed in the introduction to this paper. Bartholomew has proposed that working models of self can be classified as either positive or negative (perceived as worthy of support or not), as can their models of the other, seen as trustworthy and available, or unreliable and rejecting. From these two dichotomous classifications, four combinations can be derived: Secure attachment, associated with a positive conception of both self and others; Preoccupied attachment, indicating a sense of unworthiness or unlovability along with a positive evaluation of others; Fearful attachment, a negative self evaluation, coupled with the expectation that others also will be negatively disposed, untrustworthy and rejecting; and Dismissing attachment, a positive

sense of self-worth, coupled with a negative view of others.

Respondents are presented with four statements regarding orientation to interpersonal relationships and asked: “Which of the following best describes your feelings?” Subjects are asked to choose only the best description of their feelings by placing an “x” in the blank before it.

Validity.

Bartholomew and Horowitz (1991) argued for the construct validity of their instrument when the pattern of subjects’ results corresponded to the structure of Bartholomew’s (1990) two-dimensional model of attachment. Subjects classified in this way as fearful or preoccupied, which are predicted to be associated with a negative model of self, scored significantly lower on self-concept measures than individuals classified as secure or dismissing, who are predicted to have more positive self-models. Subjects classified as secure or preoccupied, predicted by the theory to have positive models of others, had significantly higher sociability scores on The Sociability Scale (Cheek & Buss, 1981) and reported lower levels of interpersonal problems than subjects classified as dismissing or fearful, who would be predicted to view others as untrustworthy.

Sex differences emerged on the Bartholomew and Horowitz measure, with more males than females classified as “dismissing,” whereas more females than males were classified as “fearful,” which is consistent with sex role stereotypes that men and women manifest these differing patterns of avoidance (Colin, 1996).

Information Processing Attributes

Latent Inhibition (LI)

Subjects within the HR and LR groups were randomly assigned to either the PE or NPE group. LI was measured for each subject using a computer-administered visual test. The visual LI task utilized was a between-subjects procedure identical to that employed by Braustein-Bercovitz and Lubow (1998). The test was administered to subjects using an IBM-compatible PC. During the preexposure phase, subjects engaged in a masking task, which consists of pairs of green letters (TT, TL, LT, LL) presented in the center of the computer screen in a rotated orientation, which constitutes a masking task with a relatively high processing load. The high load task was used in all conditions so that LI effects in the presence of a demanding processing task during PE can be assessed in both the HR and LR subject groups. Given the sample size, incorporating masking task load as a variable would have reduce the power markedly and may have diminished LI effects. A counter, initialized at 50, but not operative during the preexposure phase, was be displayed at the top center of the screen.

In addition to the masking task, subjects in the stimulus-preexposure group also viewed one of two pairs of irregularly shaped figures. The figure pair flanked the masking task letters (See Appendix B). Figure pairs are composed of two identical six-sided polygons selected by the LI test developers from a library of random shapes developed by Vanderplas and Garvin (1959) on the basis of their low association values, meaning that

there were relatively few meaningful responses elicited by these figures in a free association test. The figures, drawn in green outline, fit within an imaginary frame. Each trial of the PE group consisted of the presentation the figure-pair and the letter-pair, which was initiated and terminated simultaneously. For NPE subjects, the preexposure phase of the experiment was the same as for the PE subjects, except that no figure-pairs were presented. Screen context (i.e., the light gray background display on the screen) was held constant for all subjects and for all phases of the experiment.

Subjects were run individually and were seated approximately 20 inches from the computer monitor. Prior to the preexposure phase, subjects were told that they would see a series of pictures with letters (NPE group) or letters in between shapes (PE group). They were asked to press the key labeled “S” if the two letters are the same and the key labeled “D” if the two letters are different. The corresponding computer keys (“Z” and “/” keys, respectively) had labels of “S” and “D” affixed indicating these two choices. Subjects were told that a pair including two of the same letter in different orientations should be considered to be the same letter. One of the four letter pairs (differently orientated pairs comprised of L’s and T’s) were presented on each trial. After the first pilot subjects were run through the procedure, instructions were added that subjects should expect the first trials to come very quickly and to be prepared to feel as though they have missed the first few, due to several pilot subjects expressing concern about the speed of the presentation initially and presenting indications that they were distracted by

feeling that they were missing the initial items.

The preexposure phase was composed of 256 trials. Each trial began with a 500 millisecond white fixation point centered on the screen, followed by a 300 millisecond blank screen. Trial durations were 150 milliseconds. New trials began immediately after a response or 1.5 seconds after the cessation of the previous trial, whatever comes first. During the intertrial interval, the screen was blank. For each trial, errors in the similar-different judgement task and response time of correct responses were recorded automatically.

During the test phase, which was initiated immediately after the conclusion of the preexposure phase, each subject was given written instructions as follows:

We are now starting a new task. In this task, anything that you see on the screen may be relevant to changes in the counter. During the presentations on the screen, you will see the computer adding points to a counter at the top center of the screen; the counter will start at 50. The addition of points is guided by a rule related directly to the information on the screen.

The rule is an "100% rule," meaning every time the information on the screen that is related to the changes in the counter appears, the counter will change. Look at the screen and observe when the score on the counter rises.

From the moment that you think you understand the rule, press the **space bar** on the computer keyboard. Do this whenever you expect the computer to add a point to the counter.

If your decision is correct, a point will be subtracted from (instead of added to) the counter. If your decision is wrong, the counter will add a point. Your aim is to try to bring the number on the counter as low as possible.

After subjects read the instructions they were asked if they had any questions, and

these were answered before continuing by reiterating the instructions relevant to their question. The test phase consisted of 256 trials which were identical for all four groups. Between-trial sequencing and temporal conditions were the same as in the preexposure phase, except that target display duration was be raised to 1.0 second. The basic configuration of the target display was the same as that of the PE groups in the preexposure phase with the letter pairs of the masking phase remaining on the screen. However, only 48 of the display containing the to-be-target stimuli of the preexposure session, while 208 trials contained a new target figure. The order of presentation of the two types of targets, preexposed and novel was random, with the restriction that 12 preexposed stimulus trials will always appear in each block of 64 trials.

For both groups, the counter was decreased by a point when the subject presses the space bar in the presence of the preexposed stimulus. The counter was incremented by a point when the subject did not press the space bar in the presence of the preexposed stimulus, or when the subject pressed the bar in the presence of the nonpreexposed stimulus. All counter changes occurred at the offset of the display, which coincided with a bar press, or after 1.5 seconds if there was no response.

The dependent variable is the number of trials required to reach a learning criterion of five consecutively correct bar-press responses, if during that time there also were no false alarm responses. Subjects failing to reach this learning criterion are assigned a score of 256 (total possible trials in the test phase).

Number of hits, misses and mean latency of response for hits and misses in both

preexposure and test phases were also computed; at least five recorded latencies for hits or misses were required for computation of a mean, and all subjects in the sample had sufficient data for the computations of these means.

Reliability and Validity.

Data on the psychometric properties of this LI procedure are scant, partially due to the “between-subjects” nature of the paradigm, which makes it difficult to establish the convergent validity of the LI test with other measures, as well as to gain an index of how reliable the procedure is in measuring LI in individual subjects. The construct validity of the current procedure is indirectly attested to by the robustness of the LI paradigm across species, along with the extent to which the procedure adheres to critical aspects of the paradigm that have been discovered and replicated in previous research. These important components include holding the context constant across phases of the experiment, including sufficient a number of preexposure trials to achieve the LI effect in “normal” subjects, utilizing stimuli that have minimal inherent associative value, and incorporating a masking task with established validity (See Braustein-Bercovitz & Lubow, 1998).

Scores Derived from Data

The results of the following aspects of the computerized LI assessment were recorded by the computer for all subjects, coded, and used in subsequent analyses: 1) Trials to criterion for test phase (central variable); 2) Total errors on the masking task; 2a) Nonresponses (within the allotted time) on the masking task; 2b) False Positives

during the test phase (where space bar is pressed other than in the presence of target stimulus); 2c) Misses during test phase (failure to press space bar when target is presented); 3) Mean Reaction Time for masking task hits; 3a) Mean RT for masking task misses; 3b) Mean RT for test phase hits; 3c) Mean RT for test phase misses.

The LI paradigm employed is a between-subjects procedure, meaning that test phase performance (i.e., mean trials to criterion) of PE subjects was compared with that of NPE subjects within both Low Respect (LR) and High Respect (HR) subject groups, yielding a PE-NPE difference score for both the LR and HR groups, which was tested for significance as a function of “Respect” group membership. To reiterate, if LI is intact, PE groups are expected to take longer to learn the task in the test phase than the NPE groups, due to their having been preexposed to the previously inconsequential stimulus during the earlier masking phase. Consequently, according to the hypotheses previously described, in this high load task the HR group is expected to show diminished LI (resulting in a lesser PE-NPE discrepancy), as compared to the LR group.

Contingency Perception (CP)

Contingency Perception was measured using the Contiception computer program designed by Peter McCleod and Arnold Spence (1995). This task was administered by computer, with the order of administration (pre or post-LI) randomly counterbalanced and the order of presentation of contingency levels partially counterbalanced across subjects utilizing a Latin Square procedure.

The CP program allows the researcher to set independent parameters dictating the extent to which subjects' actions are necessary and sufficient (the two components of contingency judgements) to cause a change in an animated display. The display consists of a circle that rotates on an axis around a yellow cross, placed at the center of the display. The circle can change color (from green to red), radius, speed of rotation, and direction, respectively with F1-F4 key presses. Please see Appendix C for a depiction of the Contingency Perception computer display. The program parameters set by the researcher determine the level of responsiveness of the various keys from 0 to 100%.

For the present research, four two minute trial blocks were employed for all subjects. Subjects were told that during each two-minute trial, they were to press the F1 and F2 keys to determine how much control they feel they have over the animated display. They were instructed to mark the response sheet at the conclusion of each trial to indicate the amount of control they felt they had over each key before initiating the subsequent trial. The F1 key affected the radius of the rotation and the F2 key affected the direction of the rotation; each were set to different prespecified levels of contingency, which varied over the four trials. Partial counterbalancing utilizing a Latin Square was employed to control for order effects that might exist in relation to the four contingency level pairings. Contingency levels for F1 and F2 keys respectively were as follows: 15% & 85%; 100% & 15%; 15% & 50%; and 85% and 50%.

Reliability and Validity.

There are few data regarding the reliability and validity of this measure, because it is still in the experimental stages of development. The feasibility of the current procedures was examined through consultation with the program developer and faculty advisors, as well as through administration of the test to pilot subjects to identify and address problems with administration..

Scores Derived from Data.

Variables of interest that have been derived from the Contiception program for the purposes of the present research are 1) Accuracy of Contingency Estimates (ACE); 2) Contingency Seeking Preference (CSP); 3). These scores, which were developed by the present investigator, will be described in the subsequent sections.

Accuracy of Contingency Estimates (ACE) Scores.

ACE scores were derived from accuracy of contingency judgements (computed by calculating the correspondence between the subject's Likert-type assessments of perceived control and actual contingency level), with one point assessed for each degree of inaccuracy away from the actual contingency level. ACE_{high} scores were computed in the same manner to assess the accuracy of judgement of "high causal" keys in the Contingency Judgement task; in contrast, ACE_{low} scores were computed to assess the accuracy of judgements regarding "low causal" keys.

ACE_{mod} scores were computed to assess accuracy of judgements at intermediate levels of

contingency, for examination in post-hoc analyses.

Contingency Seeking Preference (CSP) Scores.

CSP scores were computed as the total number of keys pushed during the CP test.

CSP_{high} scores were the number of “high causal” key presses. CSP_{low} scores indicated the number of “low causal” key presses. $CSP_{high/tot}$ scores are a ratio of “high causal” key presses to the total number of key presses, computed by dividing by the number of “high causal” key presses by total number of key presses during the CP test. $CSP_{low/tot}$ scores indicate the relative number of low causal key presses, computed by dividing the number of low causal key presses by the total number of key presses during the CP test.

$CSP_{high/low}$ scores were computed as the ratio of high vs. low contingency key presses.

Behavioral Adjustment

Barkely Adult ADHD Scale IV

The Barkley Adult ADHD Scale (Barkley, 1996) is a recently developed self-report scale composed of a series of Likert-type items, intended for measuring ADHD in adults. The scale is comprised of the following three subscales: Inattention, Hyperactive-Impulsive, Oppositional Defiant. The psychometric properties of the scale are currently unknown, as the instrument is the early stages of use. There are norms available for ages 17 to 50, collapsed across gender and by age. Norms for age groups 17-29 and 30-49 were based on samples of approximately 300 subjects each from a student population at the University of Massachusetts. Norms for ages 50+ were based on samples of

approximately 90 subjects each from the same population.

Procedures

Overview of Group Identification and Data Collection Procedures

Male and female subjects in Introductory Psychology Pool were prescreened with the Buri Parental Authority Questionnaire (maternal and paternal versions), the Bartholomew and Horowitz Attachment Scale. The Barkley Adult ADHD Scale was also administered at the screening period to reduce the time needed for individual sessions. Total screening session took approximately 20 minutes.

Correlational analyses were performed regarding the relationship between Authoritative Parenting (Summed maternal and paternal score) and Attachment Security. A significant positive correlation was observed, as expected, so groups were constructed on the basis of both Authoritative Parenting levels and Attachment Security (rather than a cross-classification).

Subjects high on Perceived Authoritative Parenting (summed Maternal and Paternal totals) who also endorsed secure attachment were selected on the basis of a median split and constituted the High Respect group. Subjects low on Perceived Authoritative Parenting (summed Maternal and Paternal totals) who also endorsed insecure attachment were selected on the basis of a median split and constituted the Low Respect group.

Individual appointments were scheduled with subjects fitting the screening criteria described above to administer computer assessments of LI and CP. Administration time

was typically 40 minutes to one hour. See Appendix D for the script detailing the procedure employed in the assessment session. In addition to partially counterbalancing the sequence of contingency levels on the CP task, as described previously, order of administration of LI and CP were also randomly varied, as was preexposure condition for the LI task. There was no distractor task interpolated between the LI and CP tasks, as it was deemed unnecessary.

Statistical Analyses

Information Processing

Latent Inhibition

LI1. LI data are analyzed by means of a 2 x 2 x 2 ANOVA, with the factors of Parenting/ Attachment Security Classification, Pre-exposure Condition (NPE, PE) and gender¹, yielding eight groups. LI is indicated by slower learning in the test phase for subjects who have been preexposed to the test stimulus, as compared to those who have not.

LI1a. Difference in mean preexposure phase masking task errors for the LR versus the HR group is assessed for significance utilizing a one-way ANOVA.

LI1b. Differences in mean RT during the masking task phase for the LR versus the HR group are examined using a one-way ANOVA.

Contingency Perception

CP1, 1a, & 1b. Mean differences in Contingency Perception ACE scores are analyzed by one way ANOVA's to compare accuracy measures for the HR and LR groups.

CP1c. A paired-samples *t*-test is used to compare accuracy of LR group subjects at high versus low levels of contingency.

Mode of Interaction with the Environment

Need for Contingency

NC1, 1a. Mean differences in Contingency Seeking Preference (CSP) scores are compared for the HR and LR groups by one way ANOVA's.

Behavioral Adjustment

Barkley Adult ADHD Scale IV

BA1, 2 & 3. Scores on the Inattention (BA1) and Hyperactive-Impulsive (BA2) subscales of the Barkley Adult ADHD Scale, as well as the Total score (BA3) were computed by group and entered into one way ANOVA's by group to determine whether

Subsidiary Analyses

Screening

Screen₁ The correlation between level of authoritative parenting and attachment security is computed and reported. The Pearson Product Moment Correlation procedure is used in this and all correlational analyses reported in the current research.

¹ Please see the "Results" section regarding the rationale for adding "gender" to the planned 2 x 2 ANOVA the average scores are significantly higher in the LR group than the HR group.

Screen₂: A comparison of percentages of subjects endorsing each of the attachment types with those reported in previous literature is reported.

Screen_{2a} Proportions of Secure and Insecure subjects in the current sample is compared with findings from previous research.

Screen₃ The correlation between subject perceptions of high levels of authoritarian parenting for mothers with attachment insecurity (general) is presented.

Screen_{3a & 3b} The association between high levels of authoritarian parenting and fearful (3a) and dismissing (3b) subtypes of insecure attachment is also assessed.

Post-Hoc Exploratory Analyses

A Discriminant Function Analysis is conducted with the Barkley Adult ADHD scale scores and the Contingency Perception scores entered as individual difference variables to assess their relative contribution to predicting Parenting/Attachment group membership, which, for this analysis again is considered as a dependent variable.

A Stepwise Regression Analysis was conducted with Barkley ADHD Total scores as the Dependent variable and Authoritative, Authoritarian and Permissive parenting style total scores as Independent variables.

CHAPTER 5: RESULTS

Information Processing

Latent Inhibition

LII. LI in LR vs. HR groups.

The planned 2 X 2 ANOVA examining HR vs. LR groups with preexposure condition as the second independent variable was modified to a 2 X 2 X 2 ANOVA to include gender¹. The 2 X 2 X 2 ANOVA yields a significant LI main effect for exposure for all subjects ($F [1,80]=6.798, p =.01$); however, no significant main effects or interactions are observed in conjunction with group membership. There was a significant main effect for gender ($F [1,80] = 3.96, p = .05$). In addition, there is a slight trend for the group by exposure by gender interaction ($F [1,80] = 2.649, p = .11$), which is viewed as artifact until, and unless, it is replicated in future studies. Several post-hoc analyses conducted with interesting results will be described later. Preexposed Female subjects in the High Respect uniformly did not learn the rule during the test phase of the LI task as indicated by each subject's score of 256 (maximum trials possible). Means for this analysis are presented in Table 1, on the following page.

¹ This analysis was conducted in this way because an initial analysis including the factors of "order of presentation" (that is, LI first vs. CP first) and gender reveals a main effect for gender that approaches significance ($F [1,72] = 3.036, p = .086$) and a significant interaction between gender and order ($F [1,72]= 4.462, p = .038$), but no main effect for order.

Table 1

Mean LI Test Phase Trials to Criterion by Preexposure
Condition, Group and Gender

Test Phase Trials to Criterion				
Male	PE	High Respect	<u>M</u>	180.9000
			<u>N</u>	10
			<u>SD</u>	92.9019
		Low Respect	<u>M</u>	219.1000
			<u>N</u>	10
			<u>SD</u>	72.2226
	NPE	High Respect	<u>M</u>	189.2222
			<u>N</u>	9
			<u>SD</u>	54.5087
		Low Respect	<u>M</u>	157.4545
			<u>N</u>	11
			<u>SD</u>	78.4555
Female	PE	High Respect	<u>M</u>	256.0000
			<u>N</u>	12
			<u>SD</u>	.0000
		Low Respect	<u>M</u>	228.0000
			<u>N</u>	12
			<u>SD</u>	66.8907
	NPE	High Respect	<u>M</u>	191.1538
			<u>N</u>	13
			<u>SD</u>	78.3282
		Low Respect	<u>M</u>	190.4545
			<u>N</u>	11
			<u>SD</u>	74.2460

LI1a. Masking Task Errors for LR vs. HR groups.

The planned one-way ANOVA yields no significant differences in number of masking task errors between LR and HR groups ($F [1,87] = .146, p = .703$).

LI1b. Differences in mean RT during the masking task phase for LR vs. HR groups.

A one-way ANOVA indicates no significant difference between groups in mean RT during the masking task phase ($F [1,85] = .06; p = .807$).

Contingency PerceptionCP1, CP1a., & 1b. Mean differences in Contingency ACE, ACE_{high} and ACE_{low} scores for LR vs. HR groups.

The one-way ANOVA's comparing the various scores indicative of accuracy of contingency estimates at the various contingency levels yields no significant differences in conjunction with group membership. There was no difference between groups for ACE scores (that is, the score measuring accuracy over all levels of contingency) ($F [1, 83] = .008; p = .929$), ACE_{high} ($F [1, 83] = .072; p = .789$), or ACE_{low} ($F [1, 83] = .178; p = .675$) scores. See Table 2 on the following page for a presentation of the means.

Table 2

Mean Accuracy of Contingency Estimate (ACE) Scores by Respect Group

Parenting/ Attachment Group		ACE Scores - Accuracy of Contingency Estimates	ACE (High Contingency Levels)	ACE (Low Contingency Levels)
High Respect	<u>M</u>	2.4048	.7857	.8333
	<u>N</u>	42	42	42
	<u>SD</u>	2.6232	1.2403	1.1025
Low Respect	<u>M</u>	2.4524	.8571	.7381
	<u>N</u>	42	42	42
	<u>SD</u>	2.2654	1.2010	.9642

CP1c.

A paired samples t -test reveals no significant difference in accuracy for LR subjects at high vs. low levels of contingency ($t [41] = .565, p = .565$).

Mode of Interaction with the EnvironmentNeed for ContingencyNC1. 1a Mean differences in CSP and CSP_{high/low} scores for LR vs. HR groups.

The one-way ANOVA's yield no significant differences in either the CSP ($F [1, 83] = .074; p = .786$) or CSP_{high/low} ($F [1, 83] = .402; p = .528$) scores as a function of Parenting/Attachment group membership. See Table 3 for a presentation of the means and standard deviations. Correlational results regarding CP scores are described in the "Post-hoc" analyses section.

Table 3

**Means for CP Contingency Seeking Preference (CSP)
Scores by Respect Group**

Parenting/ Attachment Group		Contingency Seeking Preference (overall key presses)	Contingency Seeking Preference (HighCont/LowCont)
High Respect	<u>M</u>	715.6429	.9384
	<u>N</u>	42	42
	<u>SD</u>	283.5639	.4521
Low Respect	<u>M</u>	698.0476	.8842
	<u>N</u>	42	42
	<u>SD</u>	308.9099	.3198

Behavioral AdjustmentBarkley Adult ADHD Scale IV

BA1. Scores on the Inattention subscale (BA1), Hyperactive-Impulsive subscale (BA2) and Total Scores (BA3) from the Barkley Adult ADHD Scale for LR vs. HR Groups.

Three one-way ANOVA's yield significant differences in means of each of the scores obtained from the Barkley Adult ADHD Scale for the different groups, with the LR group reporting significantly greater numbers of Hyperactive-Impulsive symptoms ($F(1,87) = 8.606, p = .004$), behaviors associated with Inattention ($F(1,87) = 8.212, p = .005$) and overall level of adult ADHD symptoms ($F(1,87) = 10.298, p = .002$) than the HR group. The means follow in Table 4.

Table 4

**Means and Standard Deviations of Barkley Adult ADHD
Subscale and Total Scores by Respect Group**

Group		Hyperactive-Impulsive	Inattention	Barkley Adult ADHD Scale Total
High Respect	<u>M</u>	4.0909	3.5000	7.5909
	<u>N</u>	44	44	44
	<u>SD</u>	2.2290	2.7066	4.0423
Low Respect	<u>M</u>	5.9545	5.5455	11.5000
	<u>N</u>	44	44	44
	<u>SD</u>	3.5761	3.8847	6.9967

Results of Subsidiary Analyses

Screening

Screen₁: Correlation between Level of Authoritative Parenting and Attachment

Security

A significant positive correlation was found between level of Authoritative Parenting and Attachment Security $r [567] = .204, p < .001$), indicating that higher levels

of Authoritative Parenting are associated with endorsements of secure attachment, while lower levels are associated with insecure attachment. This relationship also holds true when males and females are considered separately, but at a lower level of significance for males ($r [209] = .164, p = .017$), as compared to females ($r [356] = .224, p < .001$). Paternal authoritative parenting shows a similar relationship, exhibiting a significant positive correlation with attachment security for all subjects, with more significant findings for females $r [342] = .216, p < .001$, as compared to males ($r [196] = .160, p = .025$). Maternal authoritative parenting scores provide an exception to this pattern, yielding correlations that are significant for males ($r [200] = .195, p < .005$) and females $r [348] = .151, p < .005$) at essentially the same level.

It should be noted that the relatively smaller sample sizes could have been responsible for a lower level of significance for some of the correlations regarding males as compared to females; however, the last finding cited shows that the discrepancy in sample sizes is not associated with a lower level correlation between maternal authoritarian parenting and attachment security in males, relative to females. It should also be noted that whenever a large number of correlations are reported, the chances of Type I error are increased. The complete results of the gender-specific correlational analyses are presented in Tables 9 through 12, which can be found in Appendix E.

Screen_{2a}: Comparison of Proportions of Secure and Insecure Subjects with Previous Research.

45% of the 569 subjects in the Screening sample are classified as Secure based on their self-report, while 55% are classified as Insecure. These figures are slightly different from those presented in the previously cited large-scale attachment study (Mickelson, Kessler & Shaver, 1997) that found 59% secure and 36% insecure. Considered by gender, 42% of males in the sample are secure as compared with 46% of females. 58% of males are classified as insecure, compared with 54% of females.

Screen_{2b}: Comparison of Percentages of Subjects Endorsing Various Attachment Types with Previous Literature.

The percentages of insecure subtypes found in the present sample roughly parallel those found in Mickelson, Kessler & Shaver (1997), taking into account the additional Dismissing subtype in Bartholomew's classification, which was used in the present study. The current sample was classified as 15% preoccupied as compared with the previous 11% anxious (the analogous category), and 25.5% fearful as compared with the previous research which found 25% avoidant (analogous to fearful). It would appear by the comparisons just presented, considered with the smaller number of secure subjects in the present sample as compared with the previous study, that at least some of the Dismissing subjects as classified by Horowitz' method may be "absorbed" by the Secure and preoccupied classifications in systems that don't include this category. See Table 5, which

follows, for a presentation of the distribution of Attachment Styles in the current sample by gender.

Table 5

Attachment by Gender Cross-tabulation

Attachment Style		Male	Female	Total
<u>Secure</u>	Count	89	166	255
	% within attach	34.9%	65.1%	100.0%
	% within gender	42.2%	46.4%	44.8%
	% of Total	15.6%	29.2%	44.8%
<u>Preoccupied</u>	Count	29	60	89
	% within attach	32.6%	67.4%	100.0%
	% within gender	13.7%	16.8%	15.6%
	% of Total	5.1%	10.5%	15.6%
<u>Fearful</u>	Count	50	95	145
	% within attach	34.5%	65.5%	100.0%
	% within gender	23.7%	26.5%	25.5%
	% of Total	8.8%	16.7%	25.5%
<u>Dismissing</u>	Count	43	37	80
	% within attach	53.8%	46.3%	100.0%
	% within gender	20.4%	10.3%	14.1%
	% of Total	7.6%	6.5%	14.1%

Screen₃ Correlation between High Levels of Reported Authoritarian Parenting for Mothers and Attachment Insecurity.

A significant positive correlation is found between Maternal Authoritarian parenting and attachment insecurity ($r [563]=.113, p=.008$).

Screen_{3a} & _{3b}. Correlation between High levels of Authoritarian Parenting and Fearful (3a) and Dismissing (3b) Attachment.

Subjects reporting higher levels of Authoritarian parenting are more likely to endorse insecure attachment styles ($r [567] = .177, p < .001$), particularly the Fearful subtype ($r [567] = .117, p = .005$). Paternal Authoritarian scores appear predominantly responsible for this relationship, exhibiting a significant correlation with Fearful attachment ($r [541] = .143, p = .001$), while Maternal Authoritarian scores do not ($r [563] = .076, p = .074$). No relationship is found between total scores for Authoritarian parenting and reports of Dismissing ($r [567] = .049, p = .238$), or Preoccupied ($r [567] = .055, p = .189$) attachment styles.

Authoritarian total scores are positively correlated with Dismissing attachment for males ($r [209] = .148, p = .031$), but not for females ($r [356] = -.067, p = .207$). This difference in correlations is significant as tested with Fisher's z (Fisher's $z = 2.465822, p = .0068$). Women subjects who reported a more authoritarian approach by their parents overall ($r [356] = .146, p = .006$), or their mothers specifically ($r [349] = .157, p = .003$) were more likely to endorse a Preoccupied attachment style and *less* likely to report Dismissing attachment ($r [349] = -.150, p = .005$ [correlation with Maternal Authoritarian score]). Male subjects reporting higher levels of paternal authoritarian parenting were more likely to endorse a Fearful attachment style ($r [196] = .192, p = .007$). The same relationship holds true for females ($r [342] = .121, p = .025$). There were no significant

relationships between Maternal Authoritarian scores and male subjects' attachment endorsements.

Results of Post-hoc Exploratory Analyses

A Stepwise Discriminant Function Analysis was conducted with Barkley Adult ADHD scale scores and Contingency Perception scores as the Independent Variables and Parenting/Attachment Group Membership (Dependent Variable). The Barkley ADHD Total Score was the variable best able to predict Parenting/Attachment Group Membership, and in fact was the only variable entered in the analysis with the stepwise procedure (Wilks Lambda [1,82] = .901, $p=.004$). The resulting equation classified only 54.8% of the subjects correctly in the sample used to derive the equation, a number that would shrink with cross validation. To explore this effect further, an additional Discriminant Analysis entering all of the individual ADHD Scale items was conducted, revealing that Barkley ADHD Scale Item number three from the Inattention Subscale is best able to predict Parenting/Attachment group membership (Wilks Lambda [1,82] = .895, $p=.003$), correctly classifying 61.9 % of cases. Item three on the Barkley ADHD Scale asks about the extent to which subjects have "difficulty sustaining (their) attention in tasks or fun activities."

Latent Inhibition

When the current sample is split by "Respect" group membership and separate 2 X 2 factorial ANOVA's, including gender and preexposure conditions as independent

variables, are performed, the LR group exhibits a significant LI effect ($F [1, 40]= 5.064, p =.03$), whereas the HR group does not ($F [1,40] = 1.966, p =.169$). Closer scrutiny of the means suggests that the discrepancy in learning between Low Respect PE and NPE subjects is predominantly due to the NPE subjects learning considerably more rapidly than the PE group (as compared with the HR group. It is important to note that this test is not supported on the basis of the 3-way interaction in the $2 \times 2 \times 2$ ANOVA reported above; it allows no statistical comparison between groups, and that this comparison is nonsignificant as performed previously. Thus, these results must be interpreted with extreme caution. The means for LI Trials to Criterion by group, gender and preexposure condition can be found in Table 1.

Because of the significant difference in Barkley scores in the Low vs. High respect groups, the sample was split at the median of the ADHD scores (median = 8) into high (Barkley Totals > 8) and low scorers (Barkley Totals < 8) for a highly speculative post-hoc analysis of the LI data on this basis. When the sample is classified in this manner, there are significance differences in Latent Inhibition as a function of group membership, as indicated by a significant interaction between pre-exposure condition and group, with trials to criterion as the dependent variable ($F [1, 80]=11.187, p =.001$). Upon closer examination of the means, the High Barkley Scorers learn significantly faster in the PE condition as indicated by fewer trials to achieve the learning criterion. This indicates deficient LI in individuals who report high levels of symptoms of Adult ADHD. Mean

Table 6

**Means for LI Trials to Criterion for Subjects Reporting
Low vs. High Levels of ADHD Symptoms**

Test Phase Trials to Criterion			
Low Reported ADHD Symptoms	PE	<u>M</u>	253.2500
		<u>N</u>	24
		<u>SD</u>	8.3731
	NPE	<u>M</u>	171.6190
		<u>N</u>	21
		<u>SD</u>	82.7106
High Reported ADHD Symptoms	PE	<u>M</u>	186.5000
		<u>N</u>	20
			90.2817
	NPE	<u>M</u>	191.7826
		<u>N</u>	23
		<u>SD</u>	60.9612

Auxiliary LI Measures

Bivariate Pearson correlations between the auxiliary LI measures (Reaction Time [RT]), errors, hits, and trials to criterion, for both the preexposure and test phase], the CP scores, Barkley ADHD scores, Parenting Styles and Attachment classification are calculated and reported.

RT on “hits” in the test phase of the LI task (that is, correctly hitting the key in the presence of the relevant shape) exhibited several significant correlations with the ADHD Scale Scores and parenting measures. Test phase RT for hits was negatively correlated with Barkley Total Scores ($r [77] = -.293, p = .009$) and Inattention subscale scores ($r [77] = -.356, p = .001$), indicating that reports of more symptoms of attentional dysfunction are associated with a faster key pressing response at the appearance of the stimulus that is associated with the counter increments. Gender was significantly correlated with test phase RT for hits as well, with females exhibiting a longer latency to response than males ($r [77] = .364, p = .001$). Test phase RT for hits is also negatively correlated with Maternal Authoritarian parenting ($r [77] = -.266, p = .020$) and positively correlated with Maternal Authoritative parenting ($r [77] = .248, p = .029$), indicating that individuals who respond more quickly in the presence of the relevant shape are more likely to report their mothers as being authoritarian, rather than authoritative.

The Barkley ADHD Total scores ($r [86] = .230, p = .031$) and Inattention ($r [86] = .237, p = .026$) scores were positively correlated with the number of correct

judgements on the masking task. CP Contingency Seeking Preference (CSP) Scores are negatively correlated with both test phase errors ($r [72] = -.301, p = .009$) and hits ($r [72] = -.304, p = .009$).

Parenting Style and Barkley ADHD Scores.

Based upon the significant relationship found between Respect group membership and reported ADHD symptoms, screening data are analyzed by a post-hoc one-way ANOVA (equivalent to a two-sample t -test), with the Barkley High/Low split as the independent variable and Authoritative, Authoritarian and Permissive total scores, as well as maternal and paternal scores for each of these subtypes as independent variables.

This analysis yields results consistent with those presented previously, in that individuals reporting higher levels of Adult ADHD symptoms report significantly less Authoritative parenting ($F [1,564] = 7.54, p = .006$) and significantly more Authoritarian parenting than those who score below the median on the Barkley Scale ($F [1,564] = 11.56, p = .001$). A closer look reveals that these findings are more related to paternal scores. Paternal Authoritative parenting is associated with significantly less reported symptoms ($F [1,564] = 10.803, p = .001$), while Maternal Authoritative parenting did not vary significantly as a function of ADHD scores ($F [1,547] = 1.20, p = .272$). Paternal Authoritarian parenting is significantly related to higher levels of ADHD symptoms ($F [1,536] = 10.80, p = .001$), as is Maternal authoritarian parenting at a lower level of significance ($F [1,550] = 4.73, p = .030$). Neither maternal nor paternal permissiveness

yields significant findings in relation to reported ADHD symptoms. The means are presented in Table 7.

Table 7

Means for Authoritative, Authoritarian and Permissive Total Score by High vs. Low Levels of Reported ADHD Symptoms

Level of Reported ADHD Symptoms		Authoritative Total Score	Authoritarian Total Score	Permissive Total Score
Lower Levels of Reported ADHD Symptoms	<u>M</u>	71.3643	53.4457	50.7054
	<u>N</u>	258	258	258
	<u>SD</u>	13.1021	15.1452	12.3581
Higher Levels of Reported ADHD Symptoms	<u>M</u>	68.2338	57.8084	50.7338
	<u>N</u>	308	308	308
	<u>SD</u>	13.8363	15.2431	11.7787

A stepwise regression analysis was conducted with Barkley ADHD Total Scores as the Dependent variable and Authoritative, Authoritarian and Permissive parenting style totals as Independent variables. The Authoritarian Parenting Total Score emerged as the most significant predictor of Barkley ADHD Total Score (R^2 change = .026, $p < .001$).

Contingency Perception

ACE (Accuracy of Contingency Estimates) and CSP (Contingency Seeking Preference).

Correlational analyses of ACE and CSP scores revealed a significant correlation

between accuracy (ACE) and contingency seeking (CSP) scores overall ($t [82]=.273, p = .012$) and at and high levels of contingency (CSP_{high}), suggesting that more accurate estimators of contingency tend to press the keys at a lower level when the contingency levels are high; however, at a low level of contingency, a higher level of key pressing is not associated with a significantly less accurate estimates of contingency.

A post-hoc split-plot Multivariate ANOVA assessing differences in Accuracy and Contingency Seeking (level of key pressing), Dependent Variables of ACE and CSP at high versus low levels of contingency with the factors of Respect Group membership and Level of Contingency (High vs. Low), reveals significant differences in both Accuracy ($F [3, 82] = 450.085, p < .001$) and Contingency Seeking ($F [3, 82] = 10.451, p = .002$) as a function of contingency level, as well as a significant interaction between Accuracy and Contingency Seeking Preference ($F [3, 82] = 10.447, p = .002$). There are no within-subjects effects for contingency level differences in Accuracy ($F [3, 82] = .209, p = .649$) or Contingency Seeking Preference ($F [3, 82] = .618, p = .434$) by group.

CHAPTER 6 : DISCUSSION

Latent Inhibition

While the central predictions regarding LI differences in the high load task as a function of Respect group membership were not supported, the findings of the present study are nonetheless interesting. A strong LI effect over the whole sample replicates previous findings regarding the robustness of this phenomenon in animal and human research. Although there were no significant interactions between preexposure and Parenting/Attachment Group membership, when each group was considered independently in post-hoc ANOVA's, the High Respect group did not exhibit a significant LI effect, while the Low Respect group did show significant LI, predominantly attributable to faster performance of NPE subjects (relative to the High Respect NPE group, acknowledging that this difference did not reach significance) as compared with PE subjects.

Consequently, the finding that, under conditions of high masking task load attention is rendered more diffuse for LR subjects, allowing for sufficient attention to the PE stimulus to retard learning in the test phase, is not supported upon closer scrutiny of the pattern of results. Relatively slower learning (as compared to the other group) was not observed in the PE group. However, the findings do support a greater vigilance to detail and/or increased awareness of slight changes in stimuli in the LR/NPE group, suggesting that these individuals may be more sensitive to “novel popout” effects (e.g., Johnston, Hawley, Farnham, 1993; Lubow, 1997). When the subtle shift in shapes occurs that is the key to solving the task in the LI test phase, it appears that the nonpreexposed LR subjects are more immediately aware of this change, while subjects less attuned to

slight alterations in stimuli may view the first amorphous shape, classify it as such in the abstract and fail to mobilize their attention to notice the shift to the other amorphous shape that is significant in its association with the increment on the counter. The results support the notion that individuals reared in an environment characterized by less respect as indicated by lower levels of authoritative parenting and associated attachment insecurity may be hypervigilant to detail, possibly particularly when the details are associated with reinforcement (in this case an increment on the computer counter) in an attempt to adapt to environmental unpredictability and/or intrusiveness.

Post-hoc analyses based on an alternative split of the sample, according to high versus low scores on the Barkley ADHD Scale revealed a significant LI effect by group. Closer scrutiny reveals that the pattern of results is different from the one described for LR subjects. In this case, Preexposure condition interacts with group membership; PE High Barkley scorers (who endorse higher levels of Adult ADHD symptoms) learned significantly more quickly in the test phase than PE subjects endorsing a low level of symptoms. This constitutes a classic decrement in LI, similar to that found in high schizotypal and schizophrenic subjects that cannot be attributable to an overall processing or performance decrement, because PE High Barkley Scorers learned the rule more quickly than PE Low Scorers. This suggests that the effect represents these subjects' continued attunement to the PE stimulus despite its history of having not been salient and/or associated with reinforcement.

These post-hoc findings are meaningful in that they link LI, albeit indirectly, to symptoms of attentional deficiencies, something that has not previously been demonstrated. While LI historically has been presumed to be an attentional construct, previous attempts to uncover an association between LI and attentional phenomena in humans have focused on administering neuropsychological tests purportedly measuring attention, along with a test of LI. The lack of success in these endeavors may be attributable to the ambiguity in defining attention and the diversity of attentional processes, which was discussed in the introduction.

These findings also highlight the issues brought to the forefront by Lubow (1997) related to the weaknesses of the between-subjects LI paradigm. In the event that some attentionally impaired subjects are learning more rapidly in the NPE condition due to a tendency toward hypervigilance or enhanced “novel popout” and others who manifest similar attention-related cognitive and behavioral problems are deficient in LI in the traditional sense (i.e., indicated by more rapid learning in PE subjects), it would indeed be equivocal which process was responsible for a diminished discrepancy between PE and NPE groups. It could be argued that these two processes operating simultaneously were responsible for the inconclusive findings in the current study. (In other words, there could be a difference not sufficiently significant to be captured by the planned 2 X 2 X 2 ANOVA.)

Assuming, because of the highly significant difference in mean Barkley Adult ADHD Scale Scores between LR and HR groups, that some subset of the current sample

exhibits both the hypervigilance that may exist in LR subjects overall, as well as the LI decrement seen in high Barkley scorers, higher levels of attentional impairment might be expected in these individuals relative to their less vigilant peers with intact LI, especially in situations characterized by greater stability and moderate to high levels of contingency. They are likely to experience inundation with stimuli, as well as hypersensitivity to multiple aspects and details of stimuli, which theoretically would tax processing resources.

When gender was included in the ANOVA, a significant main effect was found for gender on test phase trials to criterion on the LI task. Given that this effect was neither hypothesized nor found in previous LI research, interpretation will be deferred until and if the finding is replicated. A methodological issue in the present sample that could render this finding an artifact is the imperfect gender balance in the experimental cells.

Auxiliary Measures Derived from Latent Inhibition Test

The RT measure for hits in the test phase of the LI paradigm yields some interesting correlations with other scores. The positive correlation between test phase hit RT and symptoms of ADHD, particularly inattention, supports the notion that individuals with symptoms associated with attentional dysfunction may be more sensitive to reinforcement than individuals with relatively better attentional skills. The finding that individuals who report more authoritarian parenting on the part of their mothers possibly exhibit the same hypersensitivity to reinforcement, as indicated by significantly faster reaction times on test phase hits than individuals who report more authoritative mothers,

provides tentative support for the association between parenting style and level of responsiveness to reinforcement. Females demonstrated a tendency to be slower in correctly pressing the key in the presence of the relevant stimulus, possibly indicating that women are less sensitive to this type of reinforcement than males. The finding that Barkley Inattention and Total scores are positively correlated with the number of correct same-different judgements during the preexposure masking phase suggests that individuals reporting a higher level of attention-related symptoms are actually more vigilant in response to this type of task and more successful as a result, than individuals who report less symptoms of attentional dysfunction.

The negative correlation between CSP scores and numbers of both misses and hits in the test phase of the LI task suggests that individuals who have a tendency to press the computer keys more during the CP task are more conservative in their key pressing during the LI test phase, which could indicate a more cautious approach to this relatively ambiguous task.

Contingency Perception

The failure to find significant differences in CP measures as a function of Respect group membership as hypothesized may have been partially due to the extremely high level of variability associated with these scores (CSP Score: Range = 188 - 1,760; SD = 294.8491). The fact that there were so few significant findings other than the expected intercorrelations within the measures themselves, renders the few post-hoc correlations that *were* significant somewhat more interesting, particularly in that they fit well with the

other findings in this study. (It must be noted that the number of correlations computed does increase the probability of Type I error.)

The finding that a higher Contingency Seeking Preference (a higher level of key pressing) is significantly correlated with less accurate contingency judgements at high levels, but not at low levels, of contingency is consistent with the view that a hypervigilant/ hyperactive mode of interaction with the environment may not be effective when the environment is more predictable, but may be necessary when contingencies are intermittent. The nearly significant correlation between higher scores on the Barkley Adult ADHD Scale and greater contingency seeking preference at low levels of contingency supports the contention that there is a tendency for individuals with an inattentive/hyperactive approach to the environment to test the limits when contingencies are less reliable; this may also reflect a more pronounced reaction to frustration (i.e., extinction induced bursts of key-pressing) than is seen in subjects with less attention-related symptoms.

The results of the post-hoc within-subjects analyses examining Accuracy and Contingency Seeking (key presses) revealed significant differences in both measures at different contingency levels, as well as a significant interaction between Accuracy and Contingency Seeking. This provides support for the connection between the current results and previous research utilizing the Contiception paradigm, which has consistently found that subjects are more accurate at assessing contingencies at higher levels of contingency than at lower levels. The significant interaction between Accuracy and

Contingency Seeking accompanying this effect is probably related to the procedural differences in the current study relative to previous research with Contiception, in which subjects are instructed to press each of the keys they are judging approximately the same number of times.

Parental Respect and Behavioral Adjustment

The finding that Inattention, Hyperactive-Impulsive and Total scores on the Barkley Adult ADHD Scale were significantly higher in the Low Respect group as compared to the High Respect group provides sound support for the hypothesis that factors in the child's early parental environment may be important in the etiology of attentional dysfunction and hyperactivity. Among the alternative explanations for these findings is the possibility that more controlling authoritarian parenting strategies are employed with children who manifest attention-related behavioral problems, implicating the child's behavior as causative in the parents' approach to the child. This view is not inconsistent with the theory presented in this paper, which proposes that as children become more out of touch with their environment, they feel an increasing need to test limits to feel secure. They are thus inclined to alienate peers and adults, as well as to invite more controlling and possibly abusive responses from parents and other caretakers, which would serve further to exacerbate the child's difficulties. In support of the parental influence being more a cause than an effect, there is evidence that parenting strategies are heavily influenced by the style by which one was parented, thus parenting strategies are

behavior patterns that may be predetermined rather than reactive (e.g., Guastello & Pessig, 1998).

Another related explanation of these results is that tendencies toward ADHD have been demonstrated to have a genetic component (e.g., Sherman, Iacono, & McGue, 1997), which could affect parenting style, as well as the child's behavior. Authoritative parenting could indeed easily be characterized as a more thoughtful, less impulsive style of parenting, in which parents exhibit more self-control and consistency in response to their child and more attention to their needs than is seen in Authoritarian parents who are control-oriented, yet may exhibit less self-control in exercising their discipline. While there is no research to evaluate this, on the basis of anecdotal evidence it seems equally plausible that there may be a significant number of parents with ADHD symptoms who would assume a permissive approach to parenting, not having the skills to be systematic enough to maintain a controlling stance in relation to their child.

It is also possible that insecurely attached subjects, who perceive themselves as having been subjected to less healthy styles of parenting, may be inclined to be more self-depreciating and endorse more symptoms, despite being relatively free of the reported difficulties. Also, given that the relatively new Barkley scale has not yet been well-validated, and because some of the included symptoms are also associated with other psychological disorders, it could be argued that subjects are endorsing symptoms that are indicative of ill-defined psychopathology, rather than attentional dysfunction and hyperactivity *per se*. This is essentially a Social Desirability point of view. The current

research cannot eliminate competing explanations; however, the strong correlations between these variables found in the large screening sample seem to provide some additional support for the validity of the findings.

Within the context of this paper, the current findings can be interpreted as providing support for the theory that individuals with attention-related problems are aware of their difficulties concentrating and sitting still, and that this distractibility may be related to a tendency to persist in attending to too many aspects of the stimulus array that surrounds them, as well as a felt need to test the environment to determine the contingencies; this may manifest itself as impulsive behavior and hyperactivity. For some subset of these individuals, environmental factors may be pivotal in shaping attentional style. Specifically, an environment characterized by lower levels of parental respect may result in a defensive stance of hypervigilance, where the child is attuned to changing contingencies. This attentional/information processing style may constitute an effective adaptive to an unstable and/or intrusive environment, but may hamper efficiency when contingencies are more reliable and less invasive, particularly when an ability to preferentially focus on the salient elements of the stimulus array is required to successfully negotiate the intellectual and social tasks at hand.

Parental Respect and Attachment Security

Baumrind's (1971) factor structure for the fundamental dimensions of parenting is

supported by these results, as evidenced in the strong negative correlations between Authoritative and Authoritarian Parenting Styles, which theoretically lie at opposite ends of a continuum. According to the pattern of correlations, the continuum between authoritative and authoritarian parenting appears to run somewhat parallel to a continuum of attachment security and insecurity, although the one-endorsement attachment scale utilized in this study doesn't allow this to be fully evaluated.

Considered as a whole, the results of correlational analyses of the relationships between Baumrind's (1971) Parenting Classifications and Bartholomew's (1991) four attachment orientations indicate that Authoritative Parenting is significantly positively associated with attachment security and negatively related to insecurity, while Authoritarian parenting shows the opposite relationship. This supports the hypotheses that a respectful parenting approach, attentive to and guided by the individual needs of the child, while consistent, developmentally appropriate limits are simultaneously maintained may constitute a protective factor in development. This style of parenting is significantly related to reports of secure attachment and probably with better behavioral and social adjustment. Conversely, these findings support the notion that the more controlling and sometimes intrusive Authoritarian parenting style, which is presumably more driven by parental dynamics than the child's needs, may be an important risk factor for developing less healthy relationship patterns, due to its relationship with several subtypes of insecure attachment, with the strengths of the associations and the attachment categories

themselves varying according to gender. Permissive parenting as measured by Baumrind's assessment appears to be a relatively innocuous element of parenting, which may be slightly beneficial when it is applied by fathers and slightly detrimental when applied by mothers. A number of cautious interpretations are drawn from the results, acknowledging that correlational findings do not indicate cause and effect relationships between variables.

In general terms, the results suggest that females' attachment styles may be somewhat more influenced by their parents' approach than male subjects', evidenced by a larger number of stronger correlations between parenting variables and attachment for females. Both genders exhibit correlations suggesting that negative outcomes are associated with being parented in an Authoritarian manner, with females showing "Preoccupation" in their attachment to others in response to a more intrusive and controlling approach to them by their mothers and "Fearfulness" in response to the same kind of parenting from their fathers. Male subjects show the same, but a slightly stronger, tendency to be Fearful in their approach to relationships when their fathers treat them in an Authoritarian manner.

Mothers' authoritarian behavior appears somewhat inconsequential for males in this sample, exhibiting no significant correlations with attachment endorsements. The results suggest that mothers may influence their sons most in protective ways by assuming an Authoritative stance in their interactions with them; males reporting higher levels of maternal authoritativeness were significantly less likely to endorse a Dismissing attachment style and significantly more likely to report a "Secure" approach to others. Female

subjects were also less likely to report insecure attachment when characterizing their mother as Authoritative, with results that suggest that Maternal Authoritativeness may particularly protect against Fearful attachment in daughters. Females reporting their mothers to be Authoritarian were *less* likely to report a Dismissing style of attachment, but also considerably more likely to report Preoccupied attachment, diluting any potentially protective effects of this style of parenting.

It appears that fathers may exert potentially strong negative effects on their children through the controlling, intrusive, or possibly abusive behaviors that are associated with the Authoritarian subtype. Authoritativeness in a father's approach to parenting appears protective for both genders against Fearfulness and insecurity generally, similar to Maternal Authoritativeness. A Permissive approach by fathers may also have mild to moderate positive effects in protecting against Fearful attachment in males as well as females, who also show reduced instances of preoccupied attachment when their fathers are Permissive. While Permissiveness in mothers' parenting appears quite inconsequential for males, it appears to increase the chance that daughters will be "Dismissing" in their attachments, suggesting that lack of involvement by mothers may inspire women to be less involved with others in their social environment.

In summary, the current correlational findings considered as a whole support the possibility that both fathers and mothers may provide risk and/or resilience to their sons and daughters through their response to them, which may render their children more or less likely to feel secure in important social relationships. The current results leave open

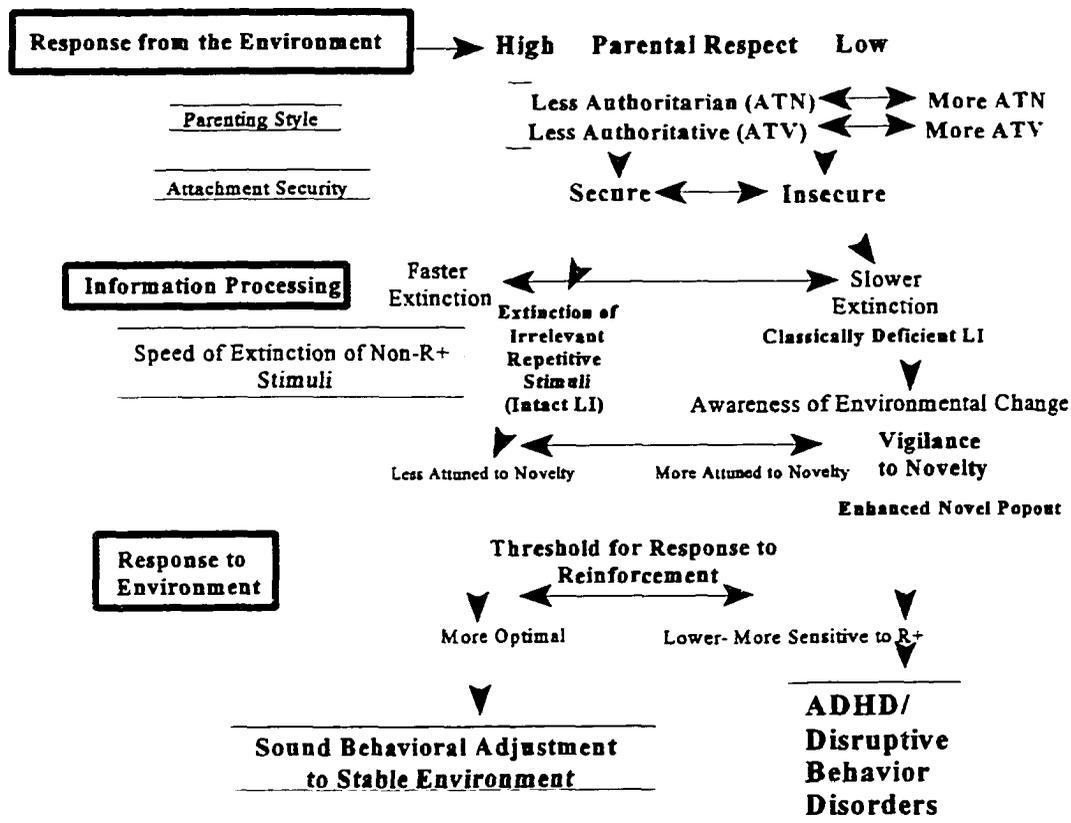
the possibility that the effects of one parent may be ameliorated by the other. The collective impact of various constellations of parenting styles in mothers and fathers, as well as the effect of variable responses within a given parent over time are important issues that remain to be explored. It is worth noting that the interpretations described in the preceding section are drawn from computing a large number of correlations, so should be viewed cautiously until replicated.

Summary and Conclusions

The model (Figure 4) that follows represents the primary elements of a revised theory of parental influence on children's information processing and behavioral adjustment that is proposed on the basis of the current findings. While some of the suggestive results in this study occurred in post-hoc analyses, they are viewed as informative for the purposes of refining the theory and directing further research; the effect sizes on many are of sufficient magnitude and the results are fundamentally consistent with many of the hypotheses that preceded this study.

Figure 5

Revised Model of Proposed Parental Influence on Attachment and Information Processing



The model depicts parental influence as being capable of either magnifying or diminishing genetic diatheses toward psychological or behavioral maladjustment.

Characteristics of information processing style that may be influenced by parental response and attachment security are depicted as factors that may mediate the progression toward sound behavioral adjustment, versus toward developing symptoms of ADHD. Departing somewhat from the model presented in the introduction, the revised model omits CP and Need for Contingency, and elaborates upon the elements of information processing that may be altered by early environmental influences, drawing from the results of the current study. CP and Need for Contingency are not discarded as potentially pivotal elements in the model, however, the current study was unable to substantiate the level or nature of their possible impact.

Baumrind's (1991) concept of Authoritative Parenting appears to subsume the elements of a parental approach that presumably encourages a child's healthy interpersonal attachment and facilitates positive emotional and cognitive development, both of which are associated with enhanced behavioral adjustment. This construct was assessed in this study as level of reported symptoms of inattention, impulsivity and hyperactivity. While this research did not attempt to disentangle the relative impact of Authoritative parenting and attachment security, when considered together these variables are positively associated with less reported difficulties in subjects' maintaining attention and self-control. Authoritarian parenting exhibits a positive association with attachment *in*security and a negative relationship with sound behavioral adjustment, as indicated by more symptoms of

ADHD. Possible mediating variables between the way in which a child is parented, level of attachment security, and his or her level of attentional skill and behavioral adjustment, may include an information processing style arising early in development that results in a child who is more attuned to slight increments in novelty and/or demonstrates a greater degree of failure in extinguishing irrelevant stimuli. It is suggested that individuals are affected to lesser or greater degrees by both of these processes, that there are environmental correlates to each of the processes, and that those who are affected by both are likely to have the highest level of attentional impairment and behavioral maladjustment. The simultaneous operation of both processes may cause individuals to be relatively inundated by stimuli, which would theoretically tax processing resources to the detriment of sustaining attention to well defined, more demanding, and/or less motivating tasks.

A very tentative possibility that receives mild support from the current results is that LI in the traditional sense may be the more “prewired” or inherent element of attentional impairment, given its demonstrated association with schizotypy and schizophrenia, both of which have been demonstrated to have a genetic diathesis. In contrast, enhanced vigilance to slight changes in environmental stimuli may be more related to early learning experiences. The attentional outgrowth of environmental stress in the form of early environmental instability, adversity, the element of which for the purposes of this study is negative and intrusive parenting, may be excessive awareness of novelty (“Novel Popout”), which may serve further to impede information processing and consequent behavioral adjustment. The cognitive, social and emotional weaknesses

conferred by these processes at a molecular and molar level may be a significant source of the “stress” that encourages expression of diatheses toward psychopathological conditions.

Implications of Findings for Further Research, Education and Treatment

Implications for Research

Latent Inhibition.

The current study emphasizes Lubow’s (1997) concerns regarding the construct validity of LI as measured by the classic between-subjects procedure, which has been employed in nearly all studies of LI in human subjects. Several researchers are currently piloting within-subjects procedures to measure LI (e.g., Swerdlow, in press; Lubow & Weiner, in press). The current study provides support for continued refinement of Lubow’s (1997) within-subjects signal detection paradigm, which makes it possible to isolate LI from Novel Popout effects.

Given that the current study was able to demonstrate an association between deficient LI and self-reported symptoms of attentional dysfunction in post-hoc analyses, future attempts to replicate the current findings and clarify the relationship between symptoms of Adult ADHD and LI deficiencies are indicated. It would be helpful to identify and better understand component processes that mediate the relationship between LI alterations and behavioral maladjustment, as well as environmental characteristics and interventions that may moderate their impact. Research examining the etiology and impact of altered patterns of LI and Novel Popout, utilizing a paradigm that is capable of

isolating and assessing each process, could provide information regarding the “nature vs. nurture” questions posed by the current study and increase understanding of their relative impact on information processing style and efficiency. The current study did not provide information regarding whether and how situational frustration and stress (e.g., such as that associated with demanding tasks) may alter information processing approach in a transient or more permanent manner, possibly as a function of certain subject characteristics and/or history. Answers to these questions would help disentangle the extent to which LI and Novel Popout are stable phenomena, or vary in accordance with the environmental context.

Contingency Perception.

While Contingency Perception shows promise as a construct that could increase understanding of attention and information processing as it relates to early environmental variables, less variable, more reliable and valid measures than those employed in the current study are needed. The development of an alternative approach utilizing the Contingency program or another procedure that would reliably assess the accuracy of subjects’ contingency judgements and identify Contingency Seeking tendencies would help to achieve this goal. The current study also points to the need for clarification of the relationship between extinction induced increases in key presses, frustration, and individual difference variables in order to better understand the traits, states, and environmental contexts (historical and current) that relate to the manifestation of increased limit testing behaviors.

Effects of Parenting.

Further research into the effects of parenting on attention and information processing is clearly indicated by the current study. Researchers may overcome the “political correctness” problems associated with this area of study (as discussed in the introduction) by focusing investigations primarily on identifying factors of risk and resilience associated with Authoritative and Authoritarian styles of parenting and their mechanism(s) of impact on children’s information processing efficiency. If the proactive goals of defining discrete parental behaviors that can be altered to increase positive outcomes for children and disseminating knowledge about these in a clear and constructive manner are sustained in this program of research, it should decrease the chances that the results of such studies would either be quelled by controversy or misused to blame or otherwise diminish parents.

Future research should also examine the role of consistency of parental approach both within and between parents to assess the impact of various levels and kinds of variation in parental response on children’s information processing style and behavioral adjustment. It would be helpful to identify whether some, as yet unknown, level and quality of positive parenting by one parent could moderate the negative effects of another parent’s approach, and if so, what are the degrees and types of negative parental influences that can or cannot be effectively ameliorated? The theory presented in the introduction predicts that the impact of a high level of inconsistency within the approach of one parent would not have a buffering effect, but questions regarding both of these

varieties of parental inconsistency are yet to be evaluated.

It would also be helpful to understand better which elements of an Authoritative approach to parenting are associated with attachment security and most beneficial to development, as well as which aspects of Authoritarian parenting are associated with attachment *insecurity* and disruptive to development. It is of more than academic interest whether, for example, the orchestration of contingencies versus the more “nonspecific” aspects of a parents’ approach to their child (e.g., warmth conveyed through vocal tone and nonverbal behaviors) are more likely to be associated with positive developmental outcomes; this information would greatly assist in honing interventions to facilitate the most crucial aspects of positive parenting in the best interests of children’s psychological and behavioral health, which will be discussed in the next section. As is typical with developmental research, longitudinal studies examining these variables in younger children and their parents, rather than retrospective, cross-sectional research would have a greater chance of providing more reliable and complete answers to the questions just described.

Implications for Treatment and Proactive Programming

Facilitating Positive Parenting.

Many proactive programs that are currently in place to facilitate early and sustained positive parenting essentially encourage an approach that could best be described as Authoritative. Because the potential benefits of an Authoritative approach to parenting were supported by the current research, it makes sense to extract and highlight the known elements of this approach and develop better ways to teach parents to employ

these with their children at an early age, while the further research just described is pending. As discussed in the introduction, identification and focus on those aspects of an Authoritative approach that are capable of being taught in treatment programs (e.g., such as, contingency management, consistency, and nonintrusion) may be more helpful and less frustrating to parents, than attempting to encourage behaviors that may not be in their behavioral repertoire, and may never be learned despite the teaching strategy, due to the parent's own parenting history and/or style of attachment. Disentangling whether and how the more "nonspecific" aspects of a parents' approach to their child can be trained could be examined through program evaluation as these interventions are devised and implemented.

Implications for Teachers and Clinicians.

Professionals who design and implement academic and behavioral interventions for children and adults with ADHD may be assisted in their endeavors by understanding aspects of how these individuals may perceive their environment. The current results support interventions that guard against stimulus overload, while increasing the salience of stimuli that require preferential focus; this may require assessing what level of novelty associated with information processing tasks helps versus hinders a given child's ability to learn. The current study also joins previous research to emphasize the importance of approaching children and adults in educational and treatment environments with a stance that is characterized by the essential components of authoritativeness or respect. Intervention approaches that are clear in conveying necessary requirements in a manner

that can be comprehended, while simultaneously taking into account the needs and communications of the individuals served, may increase their trust in the contingencies that prevail in a given setting and free more information processing resources to focus on concerns less fundamental than safety and security, namely attending to the messages conveyed there.

In summary, it appears that the response of key adults may impact important aspects of how children perceive, process, and respond to their environment. The results of the current study suggest that parents and other adults who are important in children's lives may powerfully influence their development, potentially increasing their risk or resilience in the face of the multiple challenges they will inevitably encounter. If, by increasing the level of respect or authoritativeness that is conveyed to children by significant adults, children become sufficiently secure and effective in negotiating environmental demands that they are then capable of extending the same respect to their parents and other adults, siblings, peers, and ultimately their children, a positive domino effect could ensue, markedly different than the escalating trajectory of intrusion, defensiveness and aggression that seems currently to prevail.

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CHAPTER 8: APPENDIXES

Appendix A, Part 1

Gender by Age Group Crosstabulation for Screening Sample

		Age Group						Total	
		18-21	22-25	26-30	31-35	36-40	40 and above		
Gender	Male	Count	168	31	13	3	5	3	223
		% within Gender	75.3%	13.9%	5.8%	1.3%	2.2%	1.3%	100.0%
		% within Age Group	33.5%	62.0%	52.0%	37.5%	45.5%	37.5%	37.0%
		% of Total	27.9%	5.1%	2.2%	5%	8%	5%	37.0%
	Female	Count	333	19	12	5	6	5	380
		% within Gender	87.6%	5.0%	3.2%	1.3%	1.6%	1.3%	100.0%
		% within Age Group	66.5%	38.0%	48.0%	62.5%	54.5%	62.5%	63.0%
		% of Total	55.2%	3.2%	2.0%	.8%	1.0%	.8%	63.0%
	Total	Count	501	50	25	8	11	8	603
% within Gender		83.1%	8.3%	4.1%	1.3%	1.8%	1.3%	100.0%	
% within Age Group		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
% of Total		83.1%	8.3%	4.1%	1.3%	1.8%	1.3%	100.0%	

Appendix A, Part 2

Exposure by Gender by Group Crosstabulation for LI Sample

Group	Exposure	PE	Gender				
			male	female	Total		
High Respect	PE	Count	10	12	22		
			% within Exposure	45.5%	54.5%	100.0%	
				% within Gender	52.6%	48.0%	50.0%
		% of Total			22.7%	27.3%	50.0%
		NPE	Count	9	13	22	
				% within Exposure	40.9%	59.1%	100.0%
	% within Gender				47.4%	52.0%	50.0%
		% of Total	20.5%	29.5%	50.0%		
	Total	Count	19	25	44		
			% within Exposure	43.2%	56.8%	100.0%	
				% within Gender	100.0%	100.0%	100.0%
					% of Total	43.2%	56.8%
Low Respect	PE	Count	10	12	22		
			% within Exposure	45.5%	54.5%	100.0%	
				% within Gender	47.6%	52.2%	50.0%
		% of Total			22.7%	27.3%	50.0%
		NPE	Count	11	11	22	
				% within Exposure	50.0%	50.0%	100.0%
	% within Gender				52.4%	47.8%	50.0%
		% of Total	25.0%	25.0%	50.0%		
	Total	Count	21	23	44		
			% within Exposure	47.7%	52.3%	100.0%	
				% within Gender	100.0%	100.0%	100.0%
					% of Total	47.7%	52.3%

Age Composition of LI Sample				
<u>N</u>	<u>Minimum</u>	<u>Maximum</u>	<u>M</u>	<u>SD</u>
88	18	39	20.01	3.27
88				

Appendix A, Part 3

Parenting/ Attachment Group by gender Crosstabulation for CP Sample

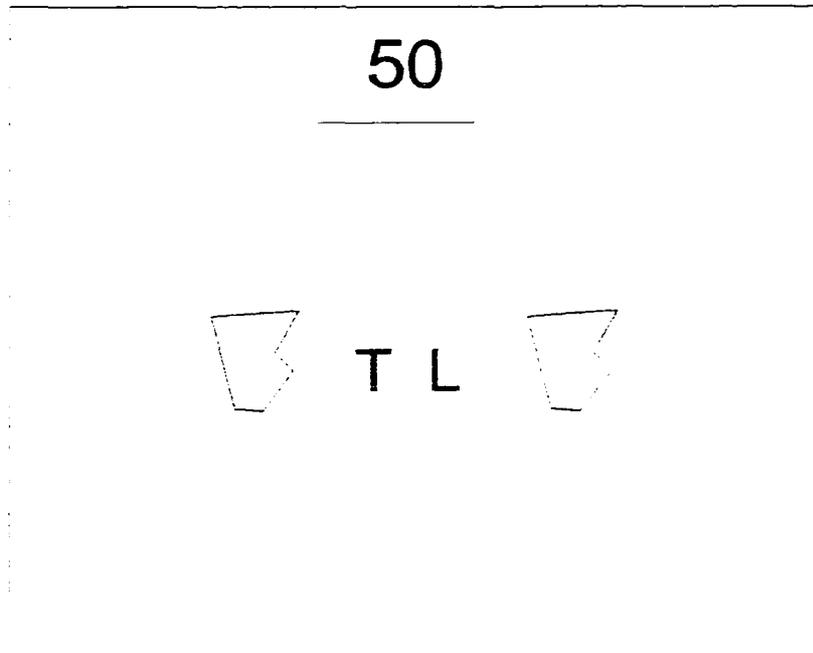
		gender			
			male	female	Total
Parenting/ Attachment Group	High Respect	Count	18	24	42
		% within Parenting/ Attachment Group	42.9%	57.1%	100.0%
		% within gender	48.6%	51.1%	50.0%
		% of Total	21.4%	28.6%	50.0%
	Low Respect	Count	19	23	42
		% within Parenting/ Attachment Group	45.2%	54.8%	100.0%
		% within gender	51.4%	48.9%	50.0%
		% of Total	22.6%	27.4%	50.0%
	Total	Count	37	47	84
		% within Parenting/ Attachment Group	44.0%	56.0%	100.0%
		% within gender	100.0%	100.0%	100.0%
		% of Total	44.0%	56.0%	100.0%

Age Composition of CP Sample

	<u>N</u>	<u>Minimum</u>	<u>Maximum</u>	<u>M</u>	<u>SD</u>
AGE	84	18	39	20.36	3.57

Appendix B

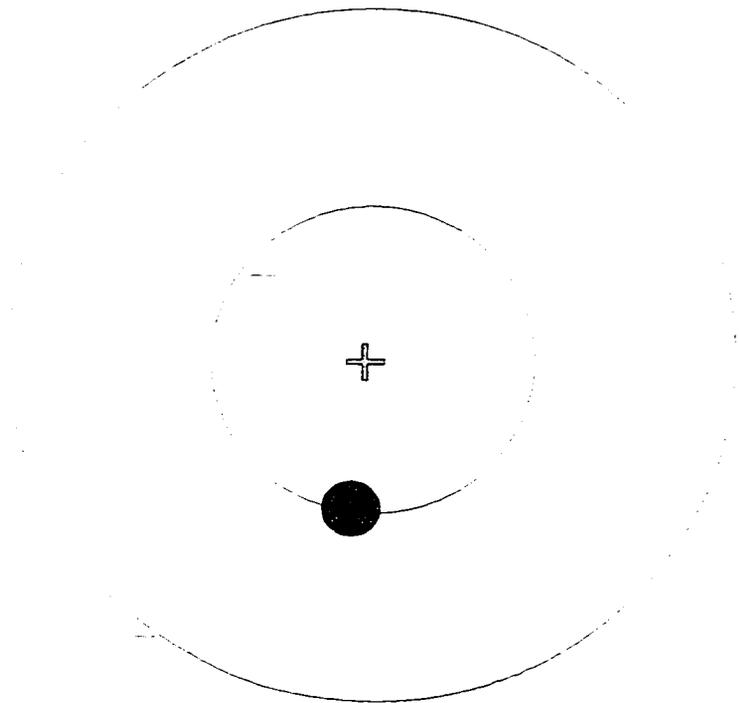
Depiction of the Latent Inhibition Computer Display



Appendix C

Depiction of the Contingency Perception Computer Display

F1: F2: F3: F4:



Appendix D
Script for Experimental Sessions

1) Set out sharpened pencils and experimental packets and key to appropriate sequence for counterbalancing strategy on table.

2) Boot up computers. Consult counterbalancing sheet and start LI or CP, depending on the particular order indicated for that subject.

To Start LI: type cd:\LI; type hedtst; You see, "program starts, pls wait"

IMPORTANT!

Wait until the next screen appears. Press NO keys while waiting. In a moment, a screen appears labeled: HEDVA TEST- START MENU

Type 2 <return> to get the "Initialize User Parameters Screen"

"Initial parameters not changed O.K.?" Type "y"

"User ID" Type "Subject Code [dash] Subject Number" in chronological order for both e.g., If it is subject 117 (code assigned at screening) who is sixty-third subject tested, User ID would be "117-63"

"Formation Type?" Type 1

"Formation Shift?" Type 1

"Formation 1-on; 2-off?" Number entered depends upon whether the subject is assigned to PE or NPE group (consult counterbalancing sheet where 1=PE and 2=NPE)

Type 1 for PE Ss

Type 2 for NPE Ss

"Match?" Type 1

"Phase 2...?" Type 1

"Square...?" Type 0

Main hand is? Type 1 for all subjects.

Sex is? Type 1 for all subjects.

Age is? Type any number in appropriate range.

User o.k.? will appear in the top right column of the computer screen:

Type 1 if the numbers were entered correctly. If not, correct any errors and continue.

Hit return key.

You will see screen labeled HEDVA Start Menu again. Type 3 (Start Test)

A screen will appear that says, "Initial parameters not changed O.K.?" Type "y"

A screen will appear that is labeled "Start Test 1, Please Read Instructions for Part

Appendix D, Part 2, Script for Experimental Sessions, cont'd

1.Type Y when ready to continue. Leave program here in preparation for subject.

To start CP:

Boot up computer. Press F for file menu. Enter subjects code (as above); Press the Session key and the down arrow to highlight the first, second, third and forth trial in the sequence for that particular session according to the counterbalancing sheet. Save the session using the "S" key and hit return to get to the start screen. When ready, press the key to start the test. When the subject is ready, they are asked to hit the return key to begin.

Experimenter greets subjects individually at the door to the classroom and says: *Hello. Thank you for coming to participate in this research. Please come over to this table and we'll fill out a brief form and I'll give you an overview of what you will be doing.*

Experimenter says: Please complete this form and then will talk a little bit about what you will be doing.

Subject completes the form.

Thank you. You will be asked to do some tasks that are presented on a computer. Each task will involve watching the computer screen and pressing keys. Each task will have its own specific instructions that will be provided to you before you start. These will take about 45 minutes to an hour total to complete. You'll have a very short break at the computer after the first set of tasks.

Addressing the first subject, the experimenter leads the subject to the appropriate computer saying: *Please follow me to the computer you'll be using.* Subjects are directed to respective computers in turn following the same format.

Initiate First Computer Task (according to counterbalancing order)

We are going to start the first task. (Hand subject appropriate instruction sheet for LI in accordance with his or her membership in PE or NPE group and say: *Please read these instructions. When your finished, let me know. (When finished:) Do you have any questions. Answer questions by reiterating written instructions.*

Break: subject is given a 2" break.

Appendix D, Part 3, Script for Experimental Sessions, cont'd

Lets get started again. Here are the instructions for the second task that you are going to do. Please read through them and let me know when you are finished. When finished, Do you have any questions? Answer questions by reiterating written instructions.

Goodbye: Say We are now done with the tasks. Do you have any questions or concerns?

Address these. Say, Remember the information that you have provided and the results of these tests will remain confidential, that is it will never be associated with your name or identifying data. You will be contacted after we conclude this study and invited to a presentation regarding the overall aims and outcome of this research. Thank you very much for your participation.

Appendix E

Pearson Product-Moment Correlations for Attachment Variables by Gender

Correlations between Parenting Scores and Attachment Style Endorsements for Males^a

	Authoritative Total Score	Authoritarian Total Score	Permissive Total Score	Secure	Preoccupied	Fearful	Dismissing	Attach Insec
Authoritative Total Score	1.000	-.394**	.319**	.164*	.042	-.087	-.145*	-.164*
Authoritarian Total Score	-.394**	1.000	-.399**	-.178**	-.085	.135	.148*	.178**
Permissive Total Score	.319**	-.399**	1.000	.025	.065	-.088	.006	-.025
Secure	.164*	-.178**	.025	1.000	-.341**	-.476**	-.432**	-1.000**
Preoccupied	.042	-.085	.065	-.341**	1.000	-.222**	-.202**	.341**
Fearful	-.087	.135	-.088	-.476**	-.222**	1.000	-.282**	.476**
Dismissing	-.145*	.148*	.006	-.432**	-.202**	-.282**	1.000	.432**
Attach Insec	-.164*	.178**	-.025	-1.000**	.341**	.476**	.432**	1.000

$n = 211-223$

** Correlation is significant at the .01 level (2-tailed).

* Correlation is significant at the .05 level (2-tailed).

Appendix E, Part 2

Pearson Product-Moment Correlations for Attachment Variables by Gender

Correlations between Maternal and Paternal Parenting Styles and Attachment Style Endorsements for Males^a

	Maternal Authoritative Score	Maternal Authoritarian Score	Maternal Permissive Score	Paternal Authoritarian Score	Paternal Authoritative Score	Paternal Permissive Score
Maternal Authoritative Score	1.000	-.597**	.402**	-.077	.329**	.044
Maternal Authoritarian Score	-.597**	1.000	-.621**	.412**	-.142*	-.246**
Maternal Permissive Score	.402**	-.621**	1.000	-.082	.037	.456**
Paternal Authoritarian Score	-.077	.412**	-.082	1.000	-.472**	-.584**
Paternal Authoritative Score	.329**	-.142*	.037	-.472**	1.000	.257**
Paternal Permissive Score	.044	-.246**	.456**	-.584**	.257**	1.000
Secure	.195**	-.096	.008	-.147*	.160*	.079
Preoccupied	.014	-.049	.028	-.066	.019	.073
Fearful	-.080	.036	.003	.192**	-.151*	-.150*
Dismissing	-.171*	.125	-.039	.039	-.057	-.003
Attach Insec	-.195**	.096	-.008	.147*	-.160*	-.079

	Secure	Preoccupied	Fearful	Dismissing	Attach Insec
Maternal Authoritative Score	.195**	.014	-.080	-.171*	-.195**
Maternal Authoritarian Score	-.096	-.049	.036	.125	.096
Maternal Permissive Score	.008	.028	.003	-.039	-.008
Paternal Authoritarian Score	-.147*	-.066	.192**	.039	.147*
Paternal Authoritative Score	.160*	.019	-.151*	-.057	-.160*
Paternal Permissive Score	.079	.073	-.150*	-.003	-.079
Secure	1.000	-.341**	-.476**	-.432**	-1.000**
Preoccupied	-.341**	1.000	-.222**	-.202**	.341**
Fearful	-.476**	-.222**	1.000	-.282**	.476**
Dismissing	-.432**	-.202**	-.282**	1.000	.432**
Attach Insec	-1.000**	.341**	.476**	.432**	1.000

** Correlation is significant at the .01 level (2-tailed).

* Correlation is significant at the .05 level (2-tailed)

Appendix E, Part 3

Pearson Product-Moment Correlations for Attachment Variables by Gender

Correlations between Parenting Scores and Attachment Style Endorsements for Females^a

	Authoritative Total Score	Authoritarian Total Score	Permissive Total Score		
Authoritative Total Score	1.000	-.393**	.191**		
Authoritarian Total Score	-.393**	1.000	-.488**		
Permissive Total Score	.191**	-.488**	1.000		
Secure	.223**	-.172**	.044		
Preoccupied	-.101	.146**	-.088		
Fearful	-.187**	.116*	-.020		
Dismissing	.030	-.067	.066		
Attach Insec	-.224**	.171**	-.055		

	Secure	Preoccupied	Fearful	Dismissing	Attach Insec
Authoritative Total Score	.223**	-.101	-.187**	.030	-.224**
Authoritarian Total Score	-.172**	.146**	.116*	-.067	.171**
Permissive Total Score	.044	-.088	-.020	.066	-.055
Secure	1.000	-.417**	-.559**	-.316**	-.989**
Preoccupied	-.417**	1.000	-.270**	-.152**	.417**
Fearful	-.559**	-.270**	1.000	-.204**	.546**
Dismissing	-.316**	-.152**	-.204**	1.000	.316**
Attach Insec	-.989**	.417**	.546**	.316**	1.000

$n = 358-380$

** Correlation is significant at the .01 level (2-tailed).

* Correlation is significant at the .05 level (2-tailed).

Appendix E, Part 4

Pearson Product-Moment Correlations for Attachment Variables by Gender

Correlations between Maternal and Paternal Parenting Styles and Attachment Style Endorsements for Females^d

	Maternal Authoritative Score	Maternal Authoritarian Score	Maternal Permissive Score	Paternal Authoritarian Score	Paternal Authoritative Score	Paternal Permissive Score
Maternal Authoritative Score	1.000	-.424**	.250**	-.070	.372**	-.011
Maternal Authoritarian Score	-.424**	1.000	-.576**	.390**	-.203**	-.188**
Maternal Permissive Score	.250**	-.576**	1.000	-.140**	.005	.443**
Paternal Authoritarian Score	-.070	.390**	-.140**	1.000	-.521**	-.622**
Paternal Authoritative Score	.372**	-.203**	.005	-.521**	1.000	.235**
Paternal Permissive Score	-.011	-.188**	.443**	-.622**	.235**	1.000
Secure	.149**	-.115*	.013	-.191**	.215**	.127*
Preoccupied	-.057	.157**	-.047	.094	-.082	-.109*
Fearful	-.168**	.102	-.055	.121*	-.171**	-.042
Dismissing	.067	-.150**	.116*	.023	-.005	-.012
Attach Insec	-.151**	.117*	-.014	.188**	-.216**	-.125*

	Secure	Preoccupied	Fearful	Dismissing	Attach Insec
Maternal Authoritative Score	.149**	-.057	-.168**	.067	-.151**
Maternal Authoritarian Score	-.115*	.157**	.102	-.150**	.117*
Maternal Permissive Score	.013	-.047	-.055	.116*	-.014
Paternal Authoritarian Score	-.191**	.094	.121*	.023	.188**
Paternal Authoritative Score	.215**	-.082	-.171**	-.005	-.216**
Paternal Permissive Score	.127*	-.109*	-.042	-.012	-.125*
Secure	1.000	-.417**	-.559**	-.316**	-.989**
Preoccupied	-.417**	1.000	-.270**	-.152**	.417**
Fearful	-.559**	-.270**	1.000	-.204**	.546**
Dismissing	-.316**	-.152**	-.204**	1.000	.316**
Attach Insec	-.989**	.417**	.546**	.316**	1.000

n = 344-371

** Correlation is significant at the .01 level (2-tailed).

* Correlation is significant at the .05 level (2-tailed).