THE ROLE OF HIGHER-ORDER COGNITION IN PARENTAL REFLECTIVE FUNCTIONING: A CORRELATIONAL STUDY OF EXECUTIVE AND REFLECTIVE CAPACITIES AND THE RELATED CONTRIBUTIONS OF SUBSTANCE ABUSE AND DEPRESSION

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Abstract

THE ROLE OF HIGHER-ORDER COGNITION IN PARENTAL REFLECTIVE FUNCTIONING: A CORRELATIONAL STUDY OF EXECUTIVE AND REFLECTIVE CAPACITIES AND THE RELATED CONTRIBUTIONS OF SUBSTANCE ABUSE AND DEPRESSION

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The purpose of the study was to examine the association between parental reflective function (RF) and executive cognitive function (ECF) in a sample of 29 urban mothers. Higher ECF scores, as measured by the Wisconsin Card Sort Test and Stroop Color-Word Test, were hypothesized to be correlated with parental RF, as assessed by the Parent Development Interview. The effects of depression and substance dependence were further examined, with the expectation that the presence of one or both of these conditions would be associated with worse reflective and executive abilities. The hypotheses were not supported by the data. Participants demonstrated average ECF scores despite below-average RF abilities. Lifetime histories of depression and substance dependence were not linked to worse RF or ECF when compared to controls. One significant finding indicated that mothers in remission from a former depressive episode had higher RF than mothers without a history of depression. The finding that mothers with poor RF have intact capacity for abstraction, cognitive flexibility and other ECF

abilities is discussed as a strength that may be used in treatment to bolster reflective abilities and other skills required for sensitive and effective parenting.

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Table of Contents

List of Tables

The Role Of Higher-Order Cognition in Parental Reflective Functioning: A Correlational Study of Executive and Reflective Capacities and the Related Contributions of Substance Abuse and Depression

CHAPTER ONE

Introduction

A family therapist is struck by an intelligent and caring mother who is significantly impaired in her ability to understand her teenage daughter's behavior. Though well intentioned, the mother perseverates on her daughter's frequent absences from school, her dropping grades, and her "attitude;" she is unable to contemplate the emotional causes of her daughter's desperate acts of opposition. She repeatedly asks the therapist: "Why is she doing this to me?" Although her daughter is the "identified patient," the therapist focuses primarily on the mother, struggling to help her appreciate the developmental context of her daughter's behavior and to recognize the insecurity and sadness that often underlie her daughter's delinquent behavior. The therapist's interventions are unsuccessful. How can we understand this competent and caring mother's inability to reflect on the psychological context of her daughter's behavior?

The mother in this clinical vignette is representative of many caregivers who, despite sufficient intelligence and good intentions, lack a capacity to reflect on the desires, fears, and beliefs that underlie their children's behavior. The capacity to understand behavior in terms of mental states is formally referred to as *reflective*

functioning. Originally conceived by Fonagy and his colleagues (Fonagy, Steele, Moran, Steele & Higgitt, 1991), reflective functioning enables individuals to respond not only to behavior but to the "conception of others' beliefs, feelings, attitudes, desires, hopes, knowledge, imagination, pretense, deceit, intentions, and so on" (Fonagy et al., 2002, p.24). While Fonagy and his colleagues first observed the reflective function in caregivers, Slade and her colleagues (2005) have further developed the conceptualization and measurement of a caregiver's capacity to accurately reflect on her child's inner world of feelings, beliefs and intentions and have referred to this as *parental reflective functioning.* As a parent, this reflective capacity fosters an understanding of the behavior of one's child as related to developmental processes, driven by mental states, and influenced by the thoughts and behaviors of the parent.

As parental reflective functioning becomes increasingly recognized as a capacity which, when fully developed greatly improves caregiving and when stunted significantly undermines it, how it develops (or how it can be fostered when impaired) is of significant importance. Psychoanalytic authors have looked primarily to the caregiver's own relationship with their parents, particularly the degree to which their inner world was sensitively and accurately reflected upon, as related to their reflective ability. However, Fonagy and his colleagues consider failures in empathic parenting as but one of the many contributing factors to impairments in reflective functioning (Fonagy, Gergely, Jurist & Target, 2002). These authors further suggest the influence of cognitive vulnerabilities, such as impulsivity and attentional dyscontrol, as likely to interfere with the development of reflective functioning. Reflective capacity, by definition, involves the capacity for

abstraction, the selective attending to the unobservable causes of behavior, and other cognitive processes and thereby suggests a possible link between reflective functioning and higher-order cognition. To date, the relationship between an individual's neurocognitive abilities and reflective capacity has yet to be studied.

One construct that may help explain a caregiver's reflective deficits is *Executive Cognitive Functioning* (ECF). ECF is higher order cognition involved in goal-oriented thought processes. Selective and sustained attention, capacity for abstraction, inhibitory control, and working memory are abilities subserved by executive function. Executive dysfunction is characterized by context-bound thought processes, cognitive inflexibility, and inhibitory dyscontrol. An individual with compromised executive functions is concrete and rigidly oriented toward behavior, acts before thinking, and often lacks insight. In the context of impaired executive abilities, the capacity to think about the complex and abstract world of mental states is nearly inconceivable.

When a caregiver with reflective impairments presents for treatment, there is significant opportunity to impact the caregiver, her child, and their developing relationship. There is much that can be done to resolve the emotional blocks to her reflective capacity (See Allen & Fonagy, 2006), but if cognitive impairments underlie her reflective limitations, psychotherapeutic interventions may be unsuccessful. Despite attempts to develop her reflective abilities, impairment in executive capacity – namely, an inability to reflect on behavior due to inhibitory dyscontrol, attentional difficulties, and the inability to think abstractly – may undermine any psychotherapeutic efforts. If reflective and executive capacities are linked, an initial or adjunctive intervention that

targets executive dysfunction, such pharmacological treatment or problem solving skills training, may be the most effective means of fostering reflective capacity. Thus, a caregiver's improved capacity for insight, increased inhibitory control permitting reflection before action, and other bolstered executive capacities may provide the cognitive foundation for her to develop the reflective capacities that are critical to intuitive and effective parenting.

A final aspect of the study relates to clinical depression and substance abuse. Both depressive and substance use disorders have been found to impair executive functioning (Baker & Channon, 1995; Grohman & Fals-Stewart, 2004). Neurobiological alterations associated with depression, for example, result in frontal lobe dysfunction and corresponding impairments in executive capacity (Channon & Green, 1999). In keeping with the expectation that executive and reflective capacities are linked, impaired reflective functioning would be expected in the context of depression and/or substance in a way similar to that observed in executive capacity. If related, reflective and executive capacities together represent a critical set of functions for the psychologically minded caregiver. Accordingly, identification of those factors likely to impact the development these abilities are of considerable importance.

The present study examined the link between executive and reflective capacity in mothers of 9-15 year-old children. A semi-structured interview was used to measure reflective functioning and two standard measures to assess executive function. It was hypothesized that inhibitory control, working memory and other executive capacities

would be significantly linked to reflective ability. Mothers with moderate to high executive function were anticipated to evidence commensurate reflective capacity. Conversely, executive deficits are expected to correlate significantly with reflective impairment. It was further hypothesized that the presence of depressive symptomatology or substance abuse will impair both executive and reflective capacities. Mothers who report symptoms of depression or substance abuse will evidence greater impairments in reflective functioning and executive functioning than those without these clinical symptoms.

CHAPTER TWO

Literature Review

The present study investigated the link between executive and reflective capacities in mothers of pre- and early-adolescent children. The influence of depression and substance abuse on these capacities was further examined, with the expectation that one or both of these clinical conditions will be associated with decreased executive and reflective abilities. The supporting literature is divided into three broad sections, beginning with the present conceptualization of the reflective function in the psychoanalytic and related literatures. The historical precursors to reflective capacity are presented, followed by theoretical accounts of its development, both in the context of the infant-caregiver relationship and neurocognitive correlates of perspective taking, an understanding of intentionality and other components of reflective functioning. A close review of executive functions, the hypothesized related construct to reflective functioning, is the second section to follow. The theoretical basis for their supposed relationship is next, followed by the empirical literature that both supports and contradicts the basis for a proposed relationship between executive and reflective capacities.

I. Reflective functioning

In the early 1990s, Peter Fonagy and his colleagues observed that the quality of attachment between infant and caregiver was significantly related to the caregiver's

capacity to think about and reflect upon her child's inner world (Slade, 2005). This capacity became known in the psychoanalytic literature as reflective functioning, defined as the ability to understand one's own and others' behavior in terms of mental states. Reflective capacity requires not simply responding to behavior that has been made understandable in terms of mental states, but to the *conception* of others' mental states (Fonagy, Target, Steele & Steele, 1998). Critical to reflective functioning is reasoning about mental states in the service of increased regulation of behavior. Understanding the underlying mental states of behavior, for example, must not simply be an act of reflection, but reflection as a means of making behavior meaningful and predictable. An intimate knowledge of mental states – their opaqueness, ability to contradict behavior, etc., – is fundamental to the reflective function and further distinguishes it as a unique construct. This repertoire of mental state knowledge additionally serves to make behavior understandable and therefore regulate behavior. Because reflective capacity lies in the ability to appreciate our own complex inner world and that of others, it is furthermore linked to identity and self-conception. In summary, reflective functioning is an emotional and cognitive achievement in which mental states serve to organize one's own and the behavior of others, thereby regulating behavior and consequently affect and emotion. Reflective functioning is measured using a scale developed for use with the Adult Attachment Interview (AAI; George, Kaplan & Main, 1984). Thus, reflective functioning assesses an adult's "capacity to reflect upon *memorialized*, typically past relationships with her parents" (Slade, p.4).

Parental Reflective Functioning

While the reflective function is a broad construct that explains how individuals make behavior understandable through the identification of underlying mental states and intentions, parental reflective functioning refers to this capacity in relation to one's child (Slade, 2005). Parental reflective functioning is a caregiver's capacity to recognize that her child's behavior, such as her child's aggressiveness with a sibling or over compliance with a family member, is linked to his inner world of mental states and intentions. A caregiver with significant parental reflective functioning not only recognizes her child's behavior as caused by inner states, but as influenced by her own mental states. The highly reflective parent can conceive of her daughter's oppositional behavior as belying feelings of sadness or other feelings, beliefs or intentions that are seemingly inconsistent with the behavior. A parent with reflective deficits takes their child's behavior at face value, such as acts of aggression as an indication of the child's badness, and is therefore unable to "hold the inner life of her child" (Slade, p.4). Different from reflective functioning, which is assessed based on representations of past relationships in early childhood, parental reflective functioning specifically measures a parent's capacity to both reflect on her child's internal experiences and her own experiences as a parent (Slade).

An individual's capacity to reflect on the unobservable, emotional context of their interactions with early caregivers and their current ability to similarly reflect on their child's emotional world are probably closely related (Slade, 2005). However, the reflective function is considered to be a capacity operationalized unevenly across

different situations and therefore a rating of reflective functioning may not accurately represent the capacity of the individual to use this capacity in relation to one's child. Therefore, parental reflective functioning is a useful construct not only as a measure of the parent's capacity to accurately perceive and respond to their child, thereby an indication of sensitive and emotionally attentive caregiving, but also as a potential measure of the child's developmental outcome and of the quality of attachment between caregiver and child (Slade).

Historical Context of Reflective Functioning

Critical to reflective capacity is the ability to reflect beyond what is immediately known. This is closely related to Freud's early distinction between primary and secondary processes in which "Bindung" (or linking) marked a qualitative change from an orientation to concrete, physical processes to abstract, psychological processes (Fonagy et. al., 2002). A parallel distinction between physical and psychical phenomenon was elaborated by Dennet (1978, 1987, 1988) in his tri-level theory of behavior attribution. Dennet theorized three "stances" of predicting behavior: 1) physical, 2) design, and 3) intentional. The physical stance is consistent with Freud's notion of attending to immediately known phenomena. In Dennet's example of a chess-playing computer, the predicted behavior of the computer, in the physical stance, is based on the physical properties of the computer. The design stance, a method of predicting behavior more abstract and sophisticated than that used in the physical stance, involves the programming structure of the computer and other aspects of its design to anticipate its

behavior. The third stance, involving intentionality, bases predictions of the computer's behavior on ideas about the computer's beliefs and biases.

In the mid-1980s, cognitive developmentalists further developed the concept of intentionality through the study of perspective-taking, self-monitoring of intentions and other similar processes in young children (Baron-Cohen, 2000). If a child test-subject witnessed a researcher hiding a package of candy in an unlikely place, such as a toolbox, where would they imagine another child would look for the candy if they did not see where the candy was hidden? In this exercise called the False-Belief Task, children with an appreciation of the separate minds of others would suggest that another child would look in a candy jar or another likely place. Those with an impaired or underdeveloped ability to perspective-take would point to the toolbox. Psychoanalytic writers would later identify this capacity to think about the mind of another as a developmental precursor to the reflective function.

Development of Reflective Functioning

The developing ability of young children to contemplate the minds of others and understand the emotional causes of behavior is referred to in the developmental literature as *Theory of Mind*. Theory of mind and reflective functioning are linked developmentally, but were done so following their theoretically disparate beginnings. Fonagy and his colleagues, in the independent area of attachment research, began to observe a form of reflective capacity in mothers of securely attached children; the development of the theory of reflective functioning was not a purposeful elaboration of the extant theory of mind construct. Accordingly, the construction of these related

capacities by two distinct areas of study – psychoanalytically-oriented research and developmental psychology – is reflected in correspondingly distinct accounts of how thinking about mental states, whether evidenced as the fragile and budding false-belief understanding of a five year-old or the highly developed reflective functioning of an adult, develops. Developmentalists have looked primarily to the cognitive underpinnings of perspective-taking while psychoanalytic authors, though observant of the role of cognition, look to the caregiver-infant relationship as equally if not more critical to the development of reflective capacity and subsequent reflective functioning. Shore (2003) has attempted to bridge these two lines of thought by demonstrating that the social environment and early infant-caregiver interactions shape the development of the child's developing orbitofrontal cortex and later capacity to self-regulate emotions and appraise others' emotional states.

In keeping with a theoretical framework that aims to conceptualize pathology in ways amenable to psychotherapeutic intervention, the psychoanalytic theory of reflective functioning attributes the acquisition of metacognitive abilities to the intersubjective process between the infant and caregiver (Fonagy et al., 2002). Consistently reflecting upon the intentions and other mental states of the infant, Fonagy and his colleagues theorize, enables the recognition of his mind in his caregiver's. The authors elaborate further on the relational precursors to metacognition: "In our view, the caregiver facilitates the creation of mentalizing models through complex linguistic and quasi-linguistic processes, primarily by behaving toward the child in such a way that the child is eventually led to postulate that his own behavior may be best understood if he assumes

that he has ideas and beliefs, feelings and wishes, that determine his actions, and the actions of others to him can be generalized to other similar beings" (p.53). Such a view puts metacognitive abilities in putative terms, highly influenced by the external environment (i.e., caregivers). This differs significantly from developmental theory which, according to Fonagy and his colleagues, "portrays the child as an isolated processor of information, who constructs a ToM using biological mechanisms that have an expectable failure rate where the child's endowment is less than optimal" (p.30). Qualifying reflective capacity in neurocognitive terms offers interventions of only the cognitive rehabilitative kind to which there is limited promise for growth. Conversely, the more recent conceptualization of reflective functioning by psychoanalytic authors promises interventions at the level of caregiver and infant and in later adulthood with psychotherapies that involve the modeling of "mentalized affectivity" and other reflective functioning-enhancing techniques (Fonagy et. al., 2002).

According to the developmental literature, the first signs of metacognition emerge in the second-half of the first year of life with the development of expectations about the actions of others (Kain & Perner, 2003; Meltzoff, 1995; Meltzoff, Gopnik & Repacholi, 1999). However, "expectations" about behavior is a nuanced concept in the psychoanalytic literature, representative of both mentalizing and non-mentalizing models of predicting behavior. For example, a model of social contingency in which behavior is anticipated in terms of future goal states is referred to by Gergely and Csibra (1996) as a "teleological" stance. While the developmentalists and psychoanalysts alike see the capacity to anticipate behavior as a precursor to mentalization, it is a later-developing

capacity for "representational mapping," the ability of the child to understand and match his mental state with that of his caregiver between 6 and 18 months of age (Fonagy et al., 2002), that is critical to mentalization, according to psychoanalytic authors.

In an example of representational mapping, a distressed infant may look to his caregiver to calm him and in her expression "find" his own affect, modulated by the caregiver's experience. The caregiver's representation of the infant's affect is then "mapped" onto his own representation (Fonagy et al., 2002). In the complex intersubjectivity of infant and caregiver, Fonagy and his colleagues contend, the infant begins to decipher affects in himself and caregiver. The child's increasing orientation toward the inner world of his own and others contextualizes behavior in mental states, rendering the actions of others understandable not only in terms of future goals but the desires, wishes and other mental states which conceive of those goals. Once behavior becomes understood in terms of wishes and desires, not simply goal states, behavior becomes vulnerable to influence. An appreciation of the mental states that motivate behavior marks the critical transition into mentalization. The developmentalists refer to this achievement as the development of an understanding of intentions acquired at roughly 18 months of age (Kain & Perner, 2003; Meltzoff, 1995; Meltzoff, Gopnik & Repacholi, 1999). Eighteen month-old children additionally evidence early ToM in their capacity to engage in joint attention (Baron-Cohen, 1995). In the two years that follow, the emergence of symbolic play (Bartsch & Wellman, 1989) evidences a furthering capacity for abstract thinking and representational ability. Researchers point to the understanding of desire (i.e., a mental state which drives behavior) acquired in the second

year as further evidence of early ToM as (Wellman & Woolley, 1990). At 4 years of age children demonstrate perhaps the greatest shift toward mentalization as they evidence a capacity to recognize false belief and deception (e.g., Sodian, Taylor, Harris & Perner, 1991).

The reflective function is becoming increasingly recognized as critical to the development of affect regulation, identity and other psychological processes implicated in the development of self. In the early developmental literature, ToM, the precursor to reflective functioning, was seen as a constitutional capacity significantly related to cognition and independent of external influences such as quality of caregiving. The later conceptualization of reflective function differed not only in operational terms but also in etiology, as authors Fonagy and others partly attributed its development or impairment to the nature of the infant-caregiver relationship. Despite the psychoanalytic community's focus on the novel contributions made by Fonagy and his colleagues on the significance of the infant-caregiver relationship to the development of reflective capacity, the authors have identified failures in empathic parenting as "but one route to limitations on reflective function" (p.63). The authors point to cognitive liabilities – hyperactivity, inattentiveness, impulsivity – consistent with executive dysfunction, as further related the development of the reflective function. In consideration of Fonagy and his colleagues' speculation on the role of cognition in reflective functioning and in concert with the longstanding tradition of the developmentalists to consider reflective capacity as intimately related to cognition, we turn to executive functions.

II. Executive Functions

Executive functioning refers to the higher order cognitive processes that allow for future, goal directed behavior (Morgan & Lilienfeld, 2000). Originally documented by the work of Bianchi (1922) and Luria (1966), executive function involves the formulation and direction of goal directed behavior, planning ability, inhibitory control, flexible control of attentional behaviors, working memory and the ability to retain mental representations of a task and desired outcome over time (Pennington & Ozonoff, 1996). Executive function has been referred to as a "macro construct," comprised of multiple subfunctions that work in concert to accomplish higher-order cognitive processes. Extensive, longstanding empirical study of frontal lobe dysfunction has identified the dorsolateral prefrontal cortex, orbitomedial prefrontal cortex and other components of the frontal system to subserve executive abilities (Pennington & Ozonoff). When these brain structures are damaged, patients demonstrate cognitive rigidity, impulsive behavior, and problem-solving impairments. Emerging research however, discussed in detail later, challenges the role of the frontal system and implicates a broader, more complex and variable role of the brain in executive function abilities. Individuals with dysexecutive disorders lack insight and awareness, evidence concrete thought processes, and are inflexibly oriented to the present.

Zelazo, Carter, Reznick and Frye's (1997) framework of executive function is presented in the following section. This organizational framework integrates the

temporally and functionally distinct aspects of executive function into four phases of problem-solving: 1) problem representation; 2) planning; 3) execution; and 4) evaluation.

Problem Representation

Problem representation refers to the capacity to represent and conceptualize the realization of wants and needs (Lezak, 1995). Problem representation is the capacity to conceptualize a problem with enough specificity that allows for a remedy. Lezak has identified this capacity as "volition," broadly defining it as "the capacity for intentional behavior" (p.651) and has related it to both the psychological and physical awareness of oneself. The desire to impact one's surroundings is dependent on a conception of oneself as physically and psychologically distinct from the external world, thereby making self-awareness critical to this executive capacity. Neuropsychological tests of volition require a patient to initiate activities (intent) and demonstrate an appreciation of one's physical relationship to the external environment and of "being a distinctive person in a world which mainly exists outside one's immediate awareness and is inhabited by many other distinctive individuals" (Lezak, p.652).

Planning

While problem representation involves intent, planning is the executive capacity that identifies the steps to be taken to realize one's intentions. Planning involves abstraction, the ability to conceptualize change from one's current circumstances to the intended result, as well as flexibility of thinking in order to weigh various options and outcomes. Impulse control is additionally implicated in this component of EF, allowing for the necessary space before action to reflect on possible ways of realizing the desired

end. The weighing of various options, the means of carrying them out, and conceiving of their respective outcomes further requires sustained attention. By tracking performance on mazes, for example, including the types of errors and time to complete, planning capacity can be assessed. Other tests of this executive capacity include tower tests (i.e., Tower of Hanoi, Tower of London, etc.) requiring the patient to complete a task in the fewest moves and quickest time possible and cognitive planning tasks involving visual searches and pairing of numbers.

Execution

"Execution involves keeping a plan in mind and translating that plan into action" (Zelazo, Carter, Reznick & Frye, 1997, p. 210). Cognitive flexibility and the capacity to shift are related to this ability and required when execution is indicated due to changing situational demands. Korsakoff patients, for example, who demonstrate characteristic impairments in their capacity for execution, often express desires (e.g., to have a sandwich, to go outside) but unable to act on their desire (Lezak, 1995). The "Tinkertoy® Test" (Lezak, 1981, 1982) is a standard constructional test for assessing deficits in execution that involves presenting a subject with 50 pieces of a Tinkertoy set and instructing that they construct whatever design they want. Upon completion, the subject identifies the object and the tester correspondingly evaluates the appropriateness of the figure (i.e., how much it looks like what it is intended to look like). While other aspects of executive capacity are utilized during this task, such as problem representation and planning, execution impairments are demonstrated by the use of very few pieces,

inappropriately named constructions, and random or sorted piles of pieces absent a construction (Lezak, 1995).

Evaluation

Problem-solving does not end with execution: "A performance is as effective as the performer's ability to monitor, self-correct, and regulate the intensity, tempo, and other qualitative aspects of delivery" (Lezak, 1995, p.674). Evaluation, an executive ability referred to by Lezak as "effective performance," involves self-monitoring, recognizing discrepancies between intention and outcome, identifying errors, and strategizing and carrying out a remedy for the error (Zelazo, Carter, Reznick, and Frye, 1997). Evaluation, specifically error correction, is critical to everyday reasoning and action (Zelazo, et al). One of the few neuropsychological examinations of self-monitoring deficits is a paper and pencil test. In this test, cramped writing that leaves no room for complete responses, responses on the wrong lines (e.g., response to question 5 on line 6), and writing that veers off the page and other qualities of the subject's writing are suggestive of evaluative deficits.

Development of Executive Function

The early cognitive markers of childhood are concreteness, impulsivity and an inflexible orientation to the present (Zelazo, Craik & Booth, 2004). These cognitive qualities of young children represent the slowly developing executive capacities that will later enable a conception of one's self in the past and present, reflection beyond immediately observable phenomena and other higher-order cognitive abilities. Executive

capacities are believed to undergo periodic growth spurts starting in the first year of life and extending into late adolescence (Huizinga, Dolan & van der Molen, 2006; Stuss & Anderson, 2004). According to their comprehensive review of studies on the development of executive abilities, Stuss and Anderson report improved inhibitory control resulting from a growth spurt of executive function at roughly 12 months of age, followed by further development of these abilities at 2 years. Rudimentary problem-solving abilities, conceptual and set-shifting skills develop at age 4, followed by a generally increased capacity for abstract reasoning and cognitive flexibility at age 5. Between ages 7 and 9, children demonstrate considerable advances in their planning and strategic behavior as well as a "capacity to understand mutuality underpinning interpersonal interactions" (p.75). Another spurt of rapid growth occurs in early adolescence allowing for higher-level executive capacities consistent with those demonstrated by adults.

Neurocognitive Correlates of Executive and Reflective Capacities

Researchers continue to debate as to whether executive functions are primarily subserved by the frontal lobes (Welsh, 2002) or whether multiple brain areas, of which the frontal lobes are but one part, underlie the complex cognitive processes of the executive function. Early tests of verbal fluency and abstraction came to be known as measures of frontal damage because persons with frontal lesions performed poorly on these tests, lending to the standard practice of linking the frontal region with higher-order cognition (Alvarez & Emory, 2006). Decades of empirical research followed, demonstrating a relationship, if ambiguous, between planning, selective attention and

other executive functions and the dorsolateral prefrontal cortex (DLPFC; Goldman-Rakic, 1987; Milner, 1963). The DLPFC is the "cognitive" component of the frontal cortex involved in spatial and conceptual reasoning processes (Stuss & Levine. 2002). However, recent study has demonstrated an inconsistent and less direct relationship between the executive function and the frontal lobes. Several studies, for example, have demonstrated that subjects with frontal lesions perform within normal limits on tests of executive function (e.g., Ahola, Vilkki & Servo, 1996; Damasio, 1994); other studies have shown persons with non-frontal lesions perform as poorly as subjects with frontal lesions on these measures (e.g., Axelrod, Goldman, Heaton, Curtiss, Thompson, et al.,1996).

A recent, meta-analytic review of lesion and neuroimaging studies did not support a one-to-on relationship between frontal lobe activity and higher-order cognitive processes. Regardless, strong empirical support continues for some kind of relationship between the frontal system and executive functions and future research is likely to support the theory of executive functions as a macro-construct, tapping different underlying cognitive processes and therefore reliant on both frontal and non-frontal regions (Alvarez & Emerson, 2006). In the meantime, some have chosen replace the term "frontal damage" – impaired attention, cognitive inflexibility, impulsivity, etc. – with "dysexecutive syndrome" in an attempt to further divorce executive functions from the frontal lobes and move toward a more behavioral understanding of this neuropsychological construct (Alvarez & Emerson).

In tandem with emerging research that challenges the role of the frontal lobes in executive function abilities, the neurocognitive correlates of pre-reflective functioning (ToM) are now considered to be a more complex system than originally thought. Until as recently as 2005, lesion and neuroimaging studies implicated the medial frontal lobes as critical to our ability to use inference about mental states to predict behavior, a core component of ToM. For example, the right orbitofrontal cortex, for example, was specifically activated when listening to mental words (e.g., "think", "want", "know") in contrast to action words (e.g., "move", "run", "bend") (Baron-Cohen, Ring, Schmitz, Costa, & Ell, 1994). In a study using positron emission tomography (PET), Goel et al. (1995) identified the left medial frontal lobe as responsible for taking the perspective of a person from another century (e.g., if a historical figure would be able to infer the function of a modern object). Consistent with this finding is Fletcher and colleagues' (1995) identification of the left medial frontal cortex as responsible for comprehending mentalizing stories (e.g., involving misunderstandings, etc) in contrast to stories of physical events. However, compelling new research demonstrates the important role of the temporal-parietal junction (TPJ) in ToM abilities, such as the attribution of mental states (Saxe & Wexler, 2005). Samson, Apperly, Kathirgamanathan, and Humphreys (2005) reported evidence that patients with TPJ damage were compromised in their ability to reason about the beliefs of others. In an attempt to reconcile these disparate findings, an emerging theory attempts to distinguish cognitive and emotional components of ToM abilities, of which the underlying brain mechanisms differ. Shamay-Tsoory, Tibi-Elhanany and Aharon-Peretz (2006) administered both cognitive and affective ToM tasks and found that subjects with ventromedial prefrontal damage were able to successfully

attribute cognitions to others but performed poorly when ToM stories required affective reasoning. Performance was further hampered by the affective load of the ToM stories (i.e., errors increased when the characters' emotions were particularly intense or vivid). In summary, ToM ability likely represents the compilation of varied, discrete processes subserved by a similarly complex web of brain structures, of which the prefrontal cortex is only one.

In summary, the brain regions that mediate executive and reflective abilities are not as limited to the frontal system or as domain-specific as once commonly thought. These constructs are not unitary but rather composed of multiple underlying processes, such as the emotional and cognitive components of pre-reflective functioning, influenced by a similarly complex neural basis. Recent studies further show that the brain regions recruited during executive function tasks (e.g., response selection) and ToM tasks (e.g., belief attribution) completed by the same individuals to be distinct and non-overlapping (Saxe, Schulz, & Jiang, 2006). Despite considerable research amassed on the neurocognitive correlates of pre-reflective functioning (e.g., ToM), study of the brain regions implicated during demonstrations of reflective functioning has not yet begun. Therefore, the relationship between these two constructs — reflective functioning and executive functions — on a neurocognitive level is relatively unknown. Further study is needed to isolate brain regions involved during more complex reflective exercises which involve a combination of abilities (e.g., mental state language, abstract thinking, inhibition, representation formation, etc.) that is typical reflective functioning for comparison to brain areas known to subserve executive capacity.

III. Are Executive Functioning and Reflective Functioning Linked?

Reflective functioning refers to the ability to understand behavior in terms of mental states. Executive function is a higher-order cognitive ability to engage in motivated, goal directed behavior. It is the general hypothesis of the present study that these two constructs are linked. In consideration of this hypothesis, a theoretical rationale for the relationship between component executive and reflective abilities is presented next.

Component Processes of Reflective Functioning

The reflective function is a latent construct requiring a closer examination of its component processes to enable its comparison to executive abilities. Reflective capacity has been identified as having two core components: 1) decoding others' mental states based on observable cues, and 2) reasoning about those states in the interest of understanding or predicting behavior (Sabbagh, 2004). Reflective functioning further involves awareness of the nature of mental states, implicating the storage and retrieval aspects of memory processes. Furthermore, envisioning changes to mental states over time and other aspects of reflective functioning that involve the context of the past and the present requires a sense of self in a temporal context. The capacity for abstraction is equally critical, as moving beyond immediately observable phenomenon is involved in most demonstrations of reflective capacity.

Aspects of Reflective Functioning Theorized to be Related to Executive Component Processes

The present paper began with a clinical vignette of a mother seeking family treatment for her problematic relationship with her teenage daughter. The mother struggled with understanding the confusion, insecurity and desire for peer relations that was driving her daughter's oppositional behavior. A closer examination of the mother's specific deficits, however, may have revealed the influence of subtle neurocognitive deficits upon her ability to reflect upon her daughter's inner world. For example, the mother's inability to focus beyond her daughter's behavior (i.e., her "attitude" and academic failures) is perhaps suggestive of executive deficits that render her thought processes stimulus-bound and absent of abstraction; that is, her neurocognitive deficits orient her only to that which is immediate and observable and unable to contemplate the abstract world of feelings. The mother's failure to appreciate the developmental context of her daughter's opposition may have evidenced her inflexible tie to the immediate present and corresponding inability to place her daughter on a developmental trajectory; individuals with dysexecutive disorders evidence a similar present-oriented approach to the world. Finally, her incapacity to consider her daughter's behavior from a different perspective and her repeated use of ineffective parenting strategies are consistent with the type of cognitive inflexibility and compromised problem-solving abilities observed in individuals with executive dysfunction. In summary, the mother in this example lacks the capacity for representation and her compensatory skills for making sense of the world (i.e., the reliance upon observed behavior to guide her understanding of and responses to

others) further suggest a disorder of executive dysfunction. As evidenced in this example, a close and detailed examination of reflective functioning in operational terms theoretically demonstrates the influence of cognition upon reflective capacity. To more closely consider the interrelationship of executive and reflective abilities recruited in demonstrations of reflective functioning, the following section contrasts specific executive abilities, such as attention and self-monitoring, to reflective abilities.

Reflective Functioning Involves Abstraction/Representational Ability

Reflective functioning requires the neurocognitive capacity to form representations and think in abstract terms. The aspect of executive functioning involving abstract thinking has been further described by Hughes, Russell, and Robbins (1994): "[executive functions are] mental operations which enable the individual to disengage from the immediate context in order to guide behavior by reference to mental models or future goals" (p. 477). The capacity for abstraction enables a caregiver to think beyond her child's behavior and to the unobservable mental states that underlie behavior. When impaired, the concrete and stimulus-bound caregiver struggles to contemplate the unobservable influences on her child's behavior. Representational capacities seemingly involve the executive capacity for inhibition. The recruitment of inhibition during representational processes is necessary to filter out contradictory, observable phenomena (behavior). In keeping with this theoretical premise, the higher-order cognitive abilities subserved by executive functioning are fundamental to representational capacity and, therefore, reflective functioning.

RF Involves Attentional Capacity – Selective and Sustained

Reflective functioning frequently involves privileging mental state representations over behavior, a capacity that likely involves attentional processes. For example, a mother who demonstrates reflective abilities by compassionately allowing her five year-old son's regressive thumb-sucking just before she departs for her business trip – their first separation – is selectively attending to his sadness and worry instead of his behavior. Attentional capacities are recruited during her continued orientation to her son's internal experiences, rather than to his behavior, implicating the sustained and selective attentional capacities of executive functioning. Conversely, reflective capacity is impaired in the mother who is unable to filter the more salient, behavioral stimulus (thumb sucking) and accordingly loses sight of the mental states driving her son's regressive behavior. Attentional capacity, subserved by executive functioning, is fundamental to the capacity for reflective functioning.

RF Involves Inhibitory Control

Reflective functioning requires not only the core capacity to form representations, but also the capacity to use these representations to guide responses. When representations are of mental states (e.g., disappointment) that are contradictory to behavior (e.g., yelling), a corresponding executive capacity to inhibit a response to behavior is indicated. For example, while a mother may evidence a reflective capacity in her awareness of the sadness contributing to her daughter's tantrums, she may be unable to act in accordance with this knowledge because she is distracted by her daughter's out-of-control behavior. In the absence of inhibitory control, an individual is unable to make

use of their appreciation of the psychological contributions to behavior; though insightful, they impulsively respond to behavior. Behavior, particularly that which is affectively charged, as would be in the case of the tantruming toddler, is often strongly salient stimuli requiring the capacity for inhibitory control to selectively focus beyond it.

Reflective Capacity Involves Delay of Gratification and Impulse Control

Reflective functioning requires thinking before acting or, in neurocognitive terms, impulse control. The additional cognitive achievement of the capacity for delayed gratification is additionally required for reflective capacity. For example, the mother who hits her misbehaving child and causes her child to stop out of fear is met with immediate gains in the present (i.e., the child stops their behavior). Conversely, the mother who responds to the causes (i.e., mental states) of her child's behavior may forgo immediate rewards in exchange for a more regulated, well-adjusted and likely better-behaved child in the future. In the last description of the distressed toddler struggling to adjust to the addition of his new sister, for example, his mother opted to tolerate his disorganized and distressed behavior in the present, expecting that he would be better as a result of it in the months (or years) to come. While this mother would undoubtedly prefer her son to be on good behavior and could perhaps control his behavior in the immediate present (i.e., by using force or other disciplinary methods) she instead chose what she understood would lead to better behavior in the future. In summary, this mother's reflective capacity is closely related to her executive capacity for delayed gratification.

Reflective Functioning Involves a Sense of Self in the Context of the Past and Present – Consciousness and Self-Awareness

Critical to the reflective function is the ability to see oneself in the context of the past and present. The caregiver unable to contemplate her child in the future will simply respond to his behavior in the present, regardless of its future consequences. Furthermore, when the past is a concept too abstract and correspondingly inaccessible to a caregiver, she is unable to integrate her own childhood experiences into her understanding of her child. The capacity to experience information from the standpoint of one's own personal history is an aspect of self-awareness, an executive process mediated by the frontal lobe and its limbic connections (Stuss & Anderson, 2004). Stuss and Anderson, authors who have differentiated and hierarchically defined different levels of consciousness, write about self-awareness, the highest level of consciousness: "Self-awareness implies a self-reflecting or metacognitive ability to use one's own experience of mental states, beliefs, attitudes, and experiences to understand the mental states of others" (p.72). Thus, the reflective capacity to be self-aware is a function of the highest level of consciousness, a cognitive process of executive functioning.

Reflective Functioning Involves Reasoning and Problem-Solving Abilities

Reflective functioning involves reasoning about underlying mental states, a capacity which is related to problem-solving abilities. Consider, for example, that which prompts a caregiver to reflect on the possible mental states that influence her child's behavior. Perhaps her child continues to cry in response to the caregiver's request that he be quiet or "behave." While her son typically would whine for a minute or two more but

then find something else to do, today he remains distressed. The mother with significant reflective functioning must now wonder what is driving her son's behavior. Is he hungry? How much sleep did he get last night? Does he need a nap? His father left early this morning, before he had risen: maybe he hadn't had enough time with Daddy lately. In the cognitive literature, this is called "problem representation," one of the core aspects of executive functions described above. "Planning," the second phase of executive cognitive problem-solving, is demonstrated when this reflective mother considers giving her son a sandwich and seeing if he calms down or seeing if he is comforted by a quick call to his father. If this mother can stay focused and carryout tests of her ideas (by making that peanut-butter sandwich, for example) she is "executing" her plan. When she thinks to herself that he must not be hungry as he won't even come to the table and she better try giving his father a call, she's engaging in the "evaluation" phase of problem-solving in which she incorporates information errors (e.g., he's not eating the sandwich so he's not hungry) and contemplates other strategies. In summary, a reflective and empathically attuned mother must attend to her child's cues that indicate what their behavior means, which is a form of the executive capacity for problem-solving.

Reflective Functioning Involves Self-Monitoring

Reflective functioning develops, according to Fonagy and his colleagues, in the context of an emotionally attuned infant-caregiver relationship. However, though reflective capacity thrives as a child's intentions are consistently reflected upon by the caregiver, it is self-monitoring (an awareness of one's own thoughts, feelings and behaviors) that furthers conscious awareness of the link between mental states and

behavior. Although the reflective function is an interpersonal construct, an ability that is operationalized as a person thinking about the feelings of another, this capacity is underpinned by the ability to monitor one's own feelings. A caregiver, for example, is exhausted after a long day at work and yells at her 12 year-old son when she sees him watching T.V. instead of doing his homework. Later, at the dinner table, she tells him to "sit up straight" and to bring the fork to his mouth, not his mouth to the fork. When she's bothered by his benign comment about liking the way she cooked the green beans, she notices that she's not been her typical self tonight. In fact, she's been unusually hard on her son. This reflective mother then realizes that she's probably exhausted from her recent 12-hour workdays and her anger and irritability have little to do with him. She conveys this to her son and apologizes. There are multiple functions illustrated in this example, including insight as she locates her irritability in own problems, yet her monitoring of her own reactions is critical to her ability to think about her feelings in relation to her son. In conclusion, self-monitoring involves an awareness of one's own mental states and behaviors that is basic to the capacity for reflective functioning.

Reflective Functioning Involves Working Memory

The case for the relationship between problem-solving, attentional and representational capacities and the reflective function has been outlined above. Closely related to these cognitive abilities is working memory. An individual's attempt to understand the behavior of another in terms of mental states requires not only the capacity to selectively focus on unobservable causes (attention) or the ability to symbolize it in the abstract (representation), but working memory — the capacity to hold

multiple perspectives in mind (Carlson, Moses & Claxton, 2004). Reflective capacity involves not simply an act of reflection, but mentalization in the service of increased self-regulation, comprised of both affective and behavioral components. Therefore, reflective functioning involves not only reflection, but also reflection upon mental states that is accurate enough to predict behavior and consequently foster regulation of affect. Accordingly, working memory enables the holding of multiple psychological perspectives which is likely to assist in the understanding and consequent prediction of behavior.

In summary, a majority of the significant component processes of reflective functioning – representational capacity, abstraction, self-monitoring – theoretically involve the higher-order cognitive capacities that comprise executive functioning. An empirical review follows in consideration of this theoretical premise. However, in the absence of any studies to date that examine the relationship of executive control and reflective functioning, we turn to the empirical study of the relationship of ToM, the developmental precursor to reflective functioning, to executive capacities.

Empirical Evidence Supporting the Relationship of Executive and Reflective Capacities

Executive Function and Pre-Reflective Capacity (Theory of Mind)

The most striking empirical support for the hypothesized relationship between reflective and executive capacities stems from an extensive literature on the latter construct's relationship to theory of mind. Theory of mind (ToM) is the developmental precursor to the reflective function and therefore evidence of its relationship to executive

function provides preliminary information on how reflective functioning and executive functioning may be linked.

The association between the capacity for ToM and executive function is well documented. In typically developing children, specific executive abilities such as inhibitory capacity (Carlson & Moses, 2001; Carlson, Moses & Hix, 1998; Hala et al., 2003; Russell, 1996), working memory (Davis & Pratt, 1996; Gordon & Olson, 1998; Kennan et al., 1998), and planning ability (Bischoff-Köhler, 1998) have been identified as significant predictors for ToM competency. Further study of children with autism, a pervasive developmental disorder with known impairments in executive capacity, has shown these children to evidence corresponding deficits in their ability to attribute intentionality to behavior (Baron-Cohen et al., 1986), to monitor their own intentions (Phillips et al, 1998), and to produce deception or recognize it in others (Baron-Cohen, 1992; Sodian & Frith, 1992; Yirmiya at al., 1996). These studies show that only selective executive abilities, not executive functioning as a macro-construct, correlate with pre-reflective abilities. Similarly, a recent study conducted by Saxe, Schulz and Jiang (2006) found only certain components of ToM capacity to correlate with executive control, while other components, such as the construction of representations of others' thoughts, were dependent on independent domain-specific cognitive and neural substrates. The association between deficits of executive function and ToM have been explained by theories of functional dependency (i.e., executive capacity is required for the development of pre-reflective abilities and vice versa), shared brain regions (i.e., the frontal lobes), shared logical structure (i.e., conditional reasoning), and of executive

components in tests of pre-reflective capacities (Ozonoff et al., 1991; Pennington et al., 1998; Perner & Lang, 2000).

Equally compelling are studies that fail to demonstrate a significant relationship between executive capacity and ToM. For example, in an adult patient with frontal variant dementia, a "profound" impairment in ToM ability was evidenced despite relatively intact executive capacity (Lough, Gregory and Hodges, 2001). A similar unevenness across executive and pre-reflective abilities was reported by Baron-Cohen (1995) in his study of an autistic child who failed several ToM tasks but succeeded on tasks of executive function. Despite the intrigue of the findings that are both in support of and contradictory to a relationship between executive function and pre-reflective capacity, criticism with regard to measurement, control of influential factors, and other aspects of study design render their claims only tentatively supported.

In summary, a substantial number of studies have established a linked executive capacity with ToM, yet the nature of their relationship has not yet been conclusively determined. Findings which demonstrate a weak or inconsistent relationship between these constructs may be a function of global measures which fail to discriminate among the varied processes that underlie executive and ToM capacities, of which may have varying degrees of relatedness to each other. That is, it is possible the some executive abilities may be related to ToM abilities, yet as constructs they are not significantly related. Despite the vast number of questions that remain, the empirical study providing

some basis for a relationship between them warrants justification for the further study of the role of higher-order cognition in reflective functioning.

The Influence of Psychopathology Upon Reflective and Executive Capacities: The Role of Depression and Substance Abuse

A substantial literature documents the corresponding impairment in executive function associated with the abuse of alcohol and other psychoactive substances. The neuroanotomical changes associated with substance use, such as cortical shrinkage (Pferrerbaum et al., 1993) and diffuse brain atrophy (Tumeh et al., 1990; Pascual-Leone et al., 1991) result in discernable neurocognitive deficits. Cognitive impairments known to result from substance abuse include poor attentional control, concentration difficulties, and deficits in new learning, visual and verbal memory, and word production (Grohman & Fals-Stewart, 2004; Verdejo-Garcia, Perales & Perez-Garcia, 2007). In a comparison of the neurocognitive abilities of alcoholics and cocaine abusers in contrast to controls, Beatty et al. (1995) found both alcohol and cocaine abusers to perform more poorly than controls on measures of memory, problem solving, perceptual-motor speed, and executive function.

Executive function has further been documented to be impaired in the presence of depressive symptomatology. In their study of patients with diagnosed major depression (as well as personality disordered patients), Burgess (1991) found symptoms of depression to be significantly correlated with neurocognitive deficit. Impairment on the Trail Making Test (Rush et al., 1983), a test of executive capacity for inhibitory control,

planning and sequencing ability, was demonstrated in the depressed group. Further study has associated impairments in response suppression (Channon & Green, 1999), concept formation (Baker & Channon, 1995) and a number of other executive abilities associated with depressive conditions. In a recent study (Gualtieri, Johnson & Benedict, 2006), global neuropsychological impairment, including processing speed, memory, and reaction time, were observed in untreated depressed patients. Preliminary studies document a significant correlation between reduced hippocampal volumes (resulting from major depression) and executive dysfunction, suggesting a possible explanation for the observed relationship between executive dysfunction and depression (Frodl, Schaub, Banac, et. al., 2006).

Depressive and substance use symptomatology are both well-documented predictors of executive dysfunction. The basic abilities to plan, inhibit inappropriate responses and engage in everyday problem solving are significantly compromised in the context of drug abuse and depression. The degree to which these clinical conditions confer similar impairments upon reflective processes is relatively unknown. Preliminary studies of the effects of substance abuse in mothers have demonstrated corresponding deficits in reflective capacity (Wohlgemuth Levy, 2003; Suchman, et al., 2003, 2004; Truman, Levy & Mayes, 2004). The impact of symptoms of depression upon an individual's reflective function ability, however, has not yet been studied[1]. If a substance-abusing caregiver evidences attentional difficulties, concrete thinking, and other deficits in her executive capacity, is she further compromised in her ability to

[1] Theory of mind abilities, such as mental state decoding, have been found to be limited in depressed patients (Lee, Harkness,Sabbagh & Jacobson, 2005).

intuitively reflect upon the unobservable causes of her child's behavior? Would a depressed caregiver be limited in her capacity for reflective functioning in a way similar to her executive impairment? If executive and reflective capacities are linked, substance abuse and depression would be expected to impair reflective functioning as they do executive capacity. Identification of the substance abuse and depression as risk factors for concreteness and reflective incapacity in caregivers is critical to effective therapeutic intervention. Treatment of executive and reflective impairments, in other words, may depend not only on interventions known to be effective for those respective deficiencies (e.g., pharmacological intervention for dysexecutive disorders) but additionally on adjunctive interventions for the treatment of substance abuse and depression.

Statement of the problem

The strong and consistent association between executive capacity and pre-reflective abilities (i.e., ToM) demonstrated in the empirical literature offers preliminary support for the role of cognition in reflective functioning. Despite some contradictory findings, the majority of studies show associations between specific executive abilities, such as inhibitory control and working memory, and pre-reflective capacities. However, no studies to date have looked specifically at the more developed construct of reflective functioning in relation to executive processes. Theoretical support for the link between executive and reflective capacities is based on the assumption that the core ability to reflect on the underlying mental state contributions to behavior involves the cognitive capacity for abstraction. Inhibitory control, working memory, and attentional capacity are

further executive processes theorized to be involved in demonstrations of the reflective function.

Deficiencies in reflective capacity confer significant negative consequences on caregivers and their children. The inability to reflect on the mental states of one's child negatively impacts the child's developing identity, capacity for self-regulation, and other significant dimensions of selfhood, as well as the quality of attachment between caregiver and child. If executive and reflective capacities are linked, interventions that address the cognitive impairments of dysexecutive disorders may be the most effective means of augmenting reflective capacity. Improving a caregiver's inhibitory control, ability to think abstractly and other executive abilities may provide the necessary cognitive foundation for the development of reflective functioning. Furthermore, if these constructs are related, known risk factors for executive dysfunction may provide additional information on those factors likely to impair reflective capacity. Depression and substance abuse are known to result in executive impairments and therefore may similarly impair reflective capacity.

Hypotheses

It is hypothesized that:

1. Performance on the Wisconsin Card Sort Test *perseverative errors score* and Stroop Color-Word Test *interference score*, reliable measures of executive abilities, will be significantly correlated with reflective capacity measured by the Parent Development Interview.

2. Lifetime depression measured by the Structured Clinical Interview for the DSM-IV (SCID) will be associated with impairments in executive and reflective capacities compared to subjects without a history of depression.
3. Lifetime substance dependence, measured by the SCID, will be associated with impairments in executive and reflective capacities compared to subjects without a history of substance dependence.

CHAPTER THREE

Methods

I. Participants

The present study, in part, involves secondary analysis of data collected from a larger cross-sectional and cross-generational study of maternal difficulties (e.g., drug abuse, general psychopathology) child-rearing deficits and child outcomes designed by Dr. Denise Hien of the Department of Psychiatry at St. Luke's-Roosevelt Hospital Center (SLRHC). The above study measured EF capacity, substance use pathology and depression but did not assess RF. Accordingly, a subgroup of mothers (n=29) of the total sample (n=186) was invited back for the administration of the Parent Development Interview (PDI) to measure reflective functioning. The subgroup was randomly selected from the total sample.

SLRHC is a large, urban hospital serving Morningside Heights and West Harlem, New York. This primarily Latina population is expected comprised of Dominican (80%), Puerto Rican (10%), and of other Hispanic origins, based on previous studies at the same site using similar recruitment methods (Leite, 2000; Leite & Hien, 2000). Prior studies conducted at the SLRHC site located in Harlem have characterized samples of which 75% of residents live at or below the poverty level (Leite, 2000; Leite & Hien, 2000). The inclusion criteria required subjects to be between 18 and 55 years of age. Eligibility additionally required participants to have at least one child between the ages of 9 and 15

who had been living with them for the past six months or more. Subjects with psychotic or bipolar disorders were excluded.

Subjects were recruited from the SLRHC Ob-Gyn clinic through the distribution of flyers and in-person by staff during bi-weekly visits to the clinic. Periodic advertisements were also placed in a New York metro-area newspaper. Potential subjects were required to complete a brief screening to determine eligibility. Mothers with more than one child in the 9-15 age range were instructed to bring in the child randomly selected by staff at the completion of screening. Participation involved both the mother and her 9-15 year-old child. The mother completed an initial three-hour interview and then returned on a different occasion with her pre/early adolescent child. On the second visit, the mother completed a 90-minute interview and her child completed a separate interview of the same duration. Subject reimbursement was $100 ($30 after the first interview and the remaining $70 upon completion of the study) in addition to round-trip travel expenses for both mother and child participants. The subgroup of 29 mother participants who agreed to participate in the present study were paid an additional $25 for completion of the Parent Development Interview (PDI).

II. Setting

The data were collected at the Women's Health Project, a clinic and research program directed by Dr. Hien, located in a suite of annex building to the main SLRHC complex on 114th Street. The suite includes a main waiting area and seven offices, two of which serve as interviewing rooms for the research program.

III. Procedure

Mothers were administered measures of executive function, emotion regulation, crystallized intelligence, psychiatric functioning, substance abuse and other aspects of functioning during their first interview. During the second interview with the child, mothers were administered parenting measures and asked questions about the child's functioning while the child simultaneously met with another interviewer to complete measures of neurocognitive ability and psychiatric functioning. The subgroup of participants of the present study returned for a third visit during which the PDI was administered.

IV. Measures

A. Neurocognitive Measures of EF

The Wisconsin Card Sort Test (WCST)

This widely used test of executive dysfunction measures problem solving, capacity for abstraction, and flexibility of thought. The test consists of four stimulus cards and 128 response cards. The stimulus cards are comprised of one red triangle, two green stars, three yellow crosses and four blue circles. The response cards include a geometric shape (e.g., triangle, star, cross, or circle) of varying color (e.g., red, green, yellow or blue) and number (e.g., one, two, three or four). The four stimulus cards are presented to the subject and response cards are then given one at a time. The subject is instructed to match each response card to one of the four stimulus cards. The current sorting principle (e.g., match according to shape, color or number) must be deduced from

the examiner's responses of "correct" or "incorrect" following each match. After 10 response cards have been presented, the sorting principle changes without notification to the subject; this changing of sorting principle is repeated after every set of 10 response cards. The first sorting principle is color, then number, then form, and then reverting to color. Scores obtained from the WCST include measures of success, perseverative tendencies, non-perseverative errors, and measures of conceptual ability and learning effect. The perseverative errors score, reflective of the subject's tendency to match according to prior sorting principles, is used to identify problems in forming concepts, profiting from correction (evaluation), set-shifting, and conceptual flexibility. The perseverative errors score, the score used in this present study, is reported to be the most useful diagnostic measure of the WCST (Spreen & Strauss, 1991).

The Stroop Color-Word Test (SCWT)

The Golden version of the SCWT (Golden, 1978) assesses simple attention, gross reading speed and divided attentional abilities in individuals ranging from grade 2 to adulthood. The SCWT further tests inhibitory response by requiring the subject to inhibit an overlearned response in favor of an unusual one. This standardized version of the test consists of three parts. The first part, the "word" task (W), measures speed of word reading and requires the subject to read rows containing four different color words (i.e., red, green, yellow and blue) printed in black ink and presented in random order. The "color" task (C) involves naming rows of Xs that are colored either red, green, yellow or blue; this condition measures color-naming speed. In the final "color-word" task (CW), the subject is required to read color words that are printed in mismatched ink. For

example, the word may spell “red” but is printed in yellow ink and therefore causes response conflict (Posner & DiGirolamo, 1998). During each of the three tasks, the subject is timed for 45 seconds and the number of correct responses is counted. The SCWT interference score is calculated by subtracting a predicted CW score (CW = C × W/C + W) score from the raw CW score (interference score = raw CW – predicted CW). A lower score on the color-word card, in the presence of normal scores on the word and color cards, indicates the interference effect (Golden, 1978). The interference score will be used in the present study as a measure of executive function ability. This test effectively differentiates between normals, psychiatric patients and brain-damaged patients. Test retest reliability is .90.

B. Measurement of Parental Reflective Functioning

The Parent Development Interview (PDI)

The PDI (Aber et al., 1985; see Table 1) was originally developed to assess a mother's representation of her child, herself, and of her relationship with her child. The PDI offers an assessment of reflective functioning in the context of current, ongoing relationships and provides a general rating of the reflective function that extends beyond the parent-child relationship.

The PDI is a semi-structured clinical interview containing 45 questions that takes approximately 90 minutes to administer. The interview is comprised of questions asked of the mother about her child's experiences (i.e., times when he or she felt "distressed" or "rejected"), her own experiences as a parent (i.e., of feeling "needy" or "guilty"), and of

her relationship with her child (i.e., times when they "clicked" or when she felt she was losing her child "just a little bit"). Secondary probes are used by the interviewer when necessary to elicit more thorough explorations of the mother and child's emotional responses to events, such as routine separations, as well as the child's experience of his mother's emotional responses. In a question about "stressful separations," for example, the mother is asked to describe the kind of separation that her child might experience as more stressful than a routine separation. The following probes are available to the interviewer: 1) "How do you think your child feels about these more stressful separations?"; 2) What kinds of reports do you get about his or her response while you are away?; and 3) How do you think your child feels when you return? The following guidelines are used to rate RF based on the mother's responses.

Measuring Parental Reflective Functioning

The Addendum to the Reflective Functioning Scoring Manual (Slade, Bernbach, Grienenberger, Wohlgemuth Levy, & Locker, 2001) was be used to score parental reflective functioning. Although the original reflective functioning scoring system was developed for the AAI (Fonagy, Steele, Moran, Steele & Higgitt, 1993), it was developed with the intention of applicability to similar measures, such as the PDI. Furthermore, the conceptualization of parental reflective functioning is consistent with that outlined in Reflective Functioning Manual Version 5.0 for application to the AAI (Fonagy, Target, Steele & Steele, 1998).

Parental reflective functioning on the PDI can be assessed across four broad categories: 1) awareness of the nature of mental states; 2) the explicit effort to tease out mental states underlying behavior; 3) recognizing developmental aspects of mental states; and 4) mental states in relation to the interviewer. An 11-point scale is used, ranging from -1 (negative parental reflective functioning) to 9 (full or exceptional parental reflective functioning). Scoring was based on a reading of verbatim transcripts of audiotaped PDIs. The PDI is comprised of 14 demand questions and 24 permit questions. Demand questions are those items that have been found to directly elicit RF responses. Permit questions are those that may prompt, in a less direct manner, demonstration of the capacity for RF. Individual passage scores are considered in the rating for each PDI question. A cumulative score is additionally obtained, based on the pattern of parental reflective functioning evidenced across different PDI questions. Therefore, to obtain a high overall score, a mother must demonstrate reflective capacities in her understanding of herself, her child, and in her relationship with her child.

C. Measurement of Substance Abuse and Depression

Structured Clinical Interview for DSM-III-R/DSM-IV–SAC Version (SCID-SAC)

The SCID (Spitzer, Williams, Gibbon & First, 1992) is a semi-structured clinical interview designed to identify lifetime and current major axis I DSM-IV diagnoses using a decision-tree approach. The SCID is comprised of diagnostic modules that may be excluded to tailor the instrument to the diagnoses of interest. The SCID-SAC is a modified version of the SCID developed for use with substance-abusing populations that focuses on assessing the primary/secondary relationships between SUD and psychiatric

disorders by obtaining systematic onset and offset time lines and abstinence periods. The "Mood Disorders" and "Alcohol and Psychoactive Substance Use Disorders" modules were used in the present study. The Mood Disorders module yields diagnostic information on lifetime and current major depression and dysthymia. The Alcohol and Psychoactive Substance Use Disorders module determines lifetime and current abuse/dependence diagnoses for alcohol and all major substances. Inter-rater reliability is adequate (K = 0.68 for clinical and K = 0.51 for non-clinical lifetime diagnoses). Test-retest reliability for the SAC-version has been shown in a sample of depressed methadone maintenance patients (Nunes, Goehl, Seracini, Deliyannides, Donovan, Post-Koenig, Quitkin & Williams, 1996). Lifetime diagnoses were used for the present study. Mothers labeled with “Lifetime Depression” met criteria for current and/or past dysthymia and/or major depression. “Lifetime Substance Dependence” referred to current and/or past alcohol and/or drug dependence.

CHAPTER FOUR

Results

I. Descriptive Statistics

Table 1 presents the subjects' demographic characteristics. The sample consisted of 29 women between the ages of 30 and 50 with a mean age of 40.28 years old (sd = 5.52). The sample was primarily African-American (N = 21, 72%), single (N = 13, 44.8%) and employed full-time or part-time (N = 18, 62.1%). Yearly income was notably low, with the highest income at $6000 and a sample mean of $1480 (sd = 1301.77). Mean IQ estimate, based on WAIS Vocabulary and Information subscale scores, was 91 (sd = 13.19), qualifying this sample on the low end of average.

Table 1. Demographic characteristics of participants (N = 29)

Demographic Variables	Proportion of Women
Ethnicity	
African-American	72.4
Hispanic	20.7
White	6.9
Marital Status	
Single	44.8
Married	20.7
Divorced/separated	31.0
Widowed	3.4
Education	
Less than high-school	44.8
High-school graduate	24.1
Some college or higher	31.0
Employment	
Full-time	31.0
Part-time	31.0
Retired/disabled	3.4
Unemployed	20.7
Homemaker	13.8

RF Scores

Three coders trained to rate PDI transcripts for RF coded the 29 interviews in approximately three equal parts. To establish inter-rater reliability, two interviews were rated for overall RF by each coder, once before the start of coding and again at the half-way point. The first jointly-coded interview resulted in RF scores within a two-point range (i.e., two codes 4 and one code of 3), while ratings for the second interview were identical. These findings indicate adequate inter-rater reliability for overall RF scores.

In the present sample, parental reflective functioning scores ranged from 2 to 6 (see Table 2), with a mean score of 4 (sd = 1.09). The scope of these scores represent only part of the full range of -1 (rejection of RF or bizarre/inappropriate) to 9 (exceptional RF). (A score of 5 indicates ordinary reflective functioning.) Therefore, the scores were generally low and the majority of the subjects in this sample failed to consistently demonstrate reflective capacity.

Table 2. Distribution of reflective functioning (RF) scores (N = 29)

RF Code	Frequency	Percent	Cumulative Percent
2	2	6.9	6.9
3	7	24.1	24.1
4	11	37.9	69.0
5	6	20.7	89.7
6	3	10.3	100.0

Note: Reflective functioning codes range from -1 to 9; higher scores indicate better functioning.

ECF Scores

Executive functioning was measured by the WCST perseverative errors (PE) score and Stroop interference (I) score. The mean WCST PE score was 45 (SD = 13.67), which is considered to be on the low end of average according to normative comparisons (Heaton et al., 1993). However, a considerably large gap existed between the minimum score of 24 ("moderately-to-severely impaired") and maximum of 67 ("above-average"). However, this wide range of scores was not the result of outliers, but a fairly even distribution of low and high PE scores. The mean Stroop I score of 47 was just a few points short of the cut-off of 50, which indicates "high resistance to interference" (Golden, 1978). Stroop I scores ranged between 32 and 58, suggesting that nearly all subject scores were within "normal limits," which spans between 35 and 65 (Golden).

Table 3. Means, standard deviations and ranges for executive cognitive functioning measures (N = 29)

	Minimum	Maximum	Mean	Std. Deviation
WCST PE (T) [a]	24.00	67.00	45.31	11.33
Stroop I (T) [b]	32.00	58.00	46.76	6.08

[a] WCST: Higher scores reflect less perseverative errors and better functioning.

[b] Stroop: Higher scores reflect less interference effect and better functioning.

Depression

Close to half of the sample (N = 15, 51.7%) had lifetime depression, defined by DSM-IV criteria for a current and/or past diagnosis of major depression or dysthymia (see Table 4).

Substance Abuse

The majority of the sample had a lifetime history of substance dependence (N = 18, 62.1%), as defined by the DSM-IV current and/or past dependence criteria alcohol or any other illicit substance (with the exception of cannabis) past or present (see Table 4).

Table 4. Rates of lifetime depression and substance dependence (N = 28)*

Measure	Proportion of Women	N
Depression	51.7	15
Substance dependence	62.1	18

* One subject was missing depression and substance dependence diagnosis information.

Racial and Ethnic Differences

Table 5 shows that ethnic groups did not significantly differ in IQ ($p < .52$), or on study variables, such as RF or ECF.

Table 5. Means, standard deviations, and one-way analyses of variances (ANOVA) for effects of ethnicity on the four dependent variables.

	White		Black		Hispanic		ANOVA	
	M	SD	M	SD	M	SD	F	η^2
IQ	101.50	13.44	90.00	14.07	91.50	13.19	.52	.27
RF	3.00	1.41	4.10	1.14	4.17	.75	.99	.98
WCST (T)	48.50	3.54	45.57	12.03	43.33	21.37	.11	.01
Stroop (T)	50.00	2.83	45.71	6.24	49.33	5.75	1.14	1.3

Note. η^2 = effect size; no significant differences found between ethnic groups and study variables.

Relationships Between Study Variables

Apart from a significant positive correlation between reflective functioning scores and IQ, no significant relationships were found between demographic and study variables.

Depression and IQ

Women with a history of depression showed significantly higher IQ (M = 97.00, sd = 14.09) than those with no history of depression (M = 84.62, sd = 9.17), t (24.27) = 2.79, p< .01). Accordingly, maternal IQ was partialled out in analyses of depression variable.

Relationship Between Measures of Executive Functioning: WCST and Stroop

A plain correlation examining the relationship between the two measures of executive functioning — the WCST *perseverative errors* score and the Stroop *interference* score — was non-significant (t (26) = -.253, p<.19).

II. Hypothesis Testing

Hypothesis One

The study's first experimental hypothesis predicted that RF would be positively correlated with ECF. To explore this relationship, correlations were computed (see Table 6) between the reflective functioning scores and the two executive functioning scores, the WCST perseverative errors and Stroop interference scores. No significant relationship was found between ECF and RF scores. Thus, these results do not support the first hypothesis.

Table 6. Partial correlations of reflective functioning and executive cognitive functioning (ECF, N = 29)

	RF	
ECF Measure	r	*p*
Stroop	.300	.137
WCST [a]	.146	.476

[a] WCST: age partialled out.

Hypothesis Two

The second major research question considered the relationships between depression and both reflective and executive functioning. The first part of this hypothesis predicted that depression would be inversely correlated with maternal reflective functioning. Table 7 shows the results of ANOVAs which tested this hypothesis. A significant relationship ($p < .04$) was demonstrated between depression and maternal reflective functioning, yet in an opposite direction to that predicted in the second hypothesis: subjects with a history of depression had higher reflective functioning scores than those without a history of depression. This unexpected finding, though significant, did not support the hypothesis. A current diagnosis of depression, regardless of past diagnosis, was not significantly related to reflective functioning ability ($p < .76$); see Table 9 for secondary analyses of current depression and reflective functioning.

Table 7. Analysis of covariance (ANCOVA) comparing lifetime and current depression and reflective functioning (RF)

	RF				
	Sum of Squares	df	Mean Sq	F	P
Lifetime Depression	4.06	1	4.06	4.88	.04
Current Depression	.10	1	.10	.10	.76

Note: IQ partialled out due to its relationship to RF.

The second part of the hypothesis two predicted that depression would be associated with poorer executive functioning (See Table 8). Results of the ANCOVAs were not significant for the relationship between lifetime depression and the WCST ($p < .74$) nor for the Stroop ($p < .46$), therefore failing to support the hypothesis. Secondary analysis (see Table 9) examined the specific influence of a current depression diagnosis on ECF measures, regardless of the presence or absence of a past diagnosis. These findings were also insignificant.

Table 8. Means, standard deviations and group differences for executive cognitive functioning for those with and without lifetime depression

	Lifetime Depression				
ECF Measure	m	SD	t	df	p
Stroop I	45.73	7.52	-0.75	21.24	.46
WCST PE	45.33	16.41	0.34	26.	.74

Secondary analyses considered the specific contribution of a current diagnosis of depression, for which 8 participants (27.6%) met criteria. While current depressive symptoms were not significantly associated with Stroop I ($p<.13$), they were significantly linked to WCST PE ($p<.02$). The direction of the correlation was unexpected: mothers with a current depression diagnosis had better WCST PE scores (i.e., ECF ability) than mothers without current depression (see Table 9).

Table 9. Means, standard deviations and group differences for executive functioning for those with and without current depression

	Current Depression				
ECF Measure	m	sd	t	df	P
Stroop I	43.75	4.59	-1.57	26	.13
WCST PE	53.75	12.44	2.55	26	.02

Hypothesis Three

The third major research question examined the effect of lifetime substance dependence on RF and ECF. Lifetime substance dependence was predicted to be inversely correlated with RF. In order to test this hypothesis, ANOVAs were conducted (see Table 10) and found to be non-significant ($p < .99$). This analysis does not support the hypothesis that subject's with histories of substance dependence would evidence poorer reflective functioning.

Table 10. Analysis of covariance (ANCOVA) comparing lifetime substance dependence and reflective functioning (RF)

	RF				
	Sum of Squares	Df	Mean Sq	F	P
Substance Dependence	.000	1	.000	.000	.989

Note: IQ partialled out due to its relationship to RF.

An inverse relationship between substance use and executive functioning was further predicted in hypothesis three. Table 11 shows a t-test comparison between substance dependence and maternal reflective functioning and executive functioning. This analysis yielded similar results: a history of substance dependence was not significantly related to either reflective functioning or executive functioning scores.

Table 11. Means, standard deviations and group differences for executive cognitive functioning (ECF) for those with and without lifetime substance dependence

	Lifetime Substance Dependence				
ECF Measure	m	sd	t	df	P
Stroop	46.78	5.62	.32	26	.75
WCST	46.22	8.63	.74	11.04	.48

Further analysis intended to examine the specific contributions of a current substance dependence diagnosis, as opposed to a lifetime diagnosis. However, only one subject met criteria for current substance dependence, thereby precluding a comparative analysis.

CHAPTER FIVE

Discussion

Parental reflective functioning is critical to sensitive parenting as it enables caregivers to reflect on and empathically respond to their children's inner experiences. When RF is limited, parenting becomes frustrating and often ineffective, capable of negatively affecting the parent-child relationship and consequent development of the child. Therapeutic interventions aim to bolster a parent's ability to infer her child's inner world (Slade, Sadler, de Dois-Kenn, Webb, Ezepchick, et al., 2006; Slade, Sadler & Mayes, 2005), yet these abilities seem to rely, in part, on ECF abilities, such as capacity for abstraction. If ECF plays a critical role in a caregiver's ability to understand what is driving her child's behavior, a neurocognitive perspective of mentalization may offer promising alternative interventions. This study attempted to explore this question by examining the relationship between ECF and RF in a sample of urban mothers. Mothers with higher ECF (e.g., those with greater cognitive flexibility and capacity for abstraction) were anticipated to have higher parental RF. The impact of lifetime depression and/or substance dependence on RF was further considered, with an expectation that the presence of either diagnosis would be associated with lower RF scores.

Contrary to expectations, ECF was not significantly related to RF. While most mothers demonstrated below-average RF, ECF scores were average, suggesting poor reflective capacity despite intact higher-order cognitive abilities. Furthermore, lifetime

substance dependence was not significantly correlated with RF ability. Contrary to expectations, a lifetime history of depression (i.e., past and/or present major depression or dysthymia) was associated with significantly higher RF. Interestingly, mothers with current depression, regardless of past depression diagnosis, did not demonstrate higher RF. The discussion addresses these findings.

The relationship between RF and ECF

The first hypothesis addressing the relationship between RF and ECF yielded unexpected findings. Mothers with poor RF exhibited average performance on tests of ECF. While contrary to the expectations of this study, these findings are consistent with an emerging literature that challenges the assumed relationship between ECF and Theory of Mind (ToM), a potentially related construct to RF. Theory of mind — the specific ability to attribute mental states to oneself and others — and its relationship to ECF provided a theoretical premise for the present study: if ECF is related to the metacognitive abilities of ToM, ECF may additionally be associated with RF, a construct similarly based on metacognitive ability. While research continues to support a relationship between ToM and ECF, each has come to be regarded as composed of heterogeneous and discrete abilities, each with equally complex corresponding neural networks (e.g., Huizinga et al., 2006). While ECF abilities are thought to underpin ToM development, recent studies suggest that it is likely that *components* of ToM are related to *components* of ECF, rather than there existing a consistent relationship between these macro-constructs (Saxe, Schulz and Jiang, 2006). Existing literature establishing a link between ToM and ECF has relied primarily on samples of autistic children (Colvert et al.,

2002, Joseph & Tager-Flusberg, 2004). As ToM is increasingly studied in typically developing children, a less robust link between the two constructs has been observed. For example, researchers have found only specific ECF abilities, such as higher-order planning and conflict inhibition — not ECF as a unitary construct — to be associated with ToM (Carlson et al., 2004; Pellicano, 2007). These findings can be extended to the examination of ECF and RF in the present study, in which the lack of a correlation may be the result of examining a relationship between two complex constructs, rather than the pattern of relationships among their sub-abilities. For example, capacity for abstraction, an ECF component, may be critical to RF, while conflict inhibition, another ECF ability, may not. Accordingly, only certain aspects of RF, such as decoding mental states, may be linked to ECF. In the present study, an overall RF code was utilized and therefore specific RF components were not examined in relation to ECF abilities.

ECF: Construct or label?

ECF is a broadly and inconsistently defined construct and this increasing recognition of its limitations may have relevance to this study. Over the course of the past several years, ECF has come to be regarded as less of a unified construct and more as an overarching label representing a number of higher-order cognitive abilities (Stuss et al., 1995). Because the skills that represent ECF are distinct, only moderately correlated (Miyake et al., 2000) and subserved by different brain regions, specific ECF abilities should be examined in relation to RF. As stated earlier, if some ECF abilities are positively correlated with RF, while other abilities are not, or, are even negatively

correlated with RF, then the lack of significant findings in the present study are less compelling as evidence against an RF/ECF link.

ECF assessment measures lack sensitivity and specificity

Another consideration in understanding the lack of association found between RF and ECF in the present study is that ECF measures may have failed to detect subtle neurocognitive impairments. Aharonovich and collegues (2006) have speculated that the WCST, which is one of the most commonly used and highly regarded measures of ECF, detects gross impairment in severely disturbed populations (e.g., patients with dorsolateral lesions), but may lack complex enough tasks to tap into less severe executive deficits. Therefore, in this study's sample — a group of mothers lacking known neurocognitive deficits or serious psychiatric disorders — sub-clinical patterns of executive dyscontrol may not have been detected by the included measures of ECF.

Verbal ability and RF scores

The hypotheses of the present study were tested in a sample of urban mothers with limited educational backgrounds. Approximately half (45%) of the participants had less than a high school education and a mean IQ score of 91 (SD = 13.19). Given these sample characteristics, the role of language in the assessment of RF, specifically the measure's reliance on the articulation of thoughts and feelings, requires closer examination. While controlling for IQ may have helped to mitigate the effects of verbal limitations, it could not rectify inaccurately obtained RF scores resulting from poor verbal skills. Furthermore, IQ estimates were based on both Vocabulary and Information

subtests, of which better performance in the latter could potentially elevate IQ scores in the context of poor vocabulary. In contrast, classifications obtained from the Adult Attachment Interview (AAI), which, like the PDI, is a measure that relies on verbal expression and articulation of psychological experiences, have been found to be independent of verbal intelligence (Bakermans-Kranenburg & Van IJzendoorn, 1993). While it is unclear whether RF scores were vulnerable to educational biases, the findings should be interpreted with caution.

Diverging developmental pathways

The diverging developmental trajectories of ECF and mentalization (ToM and RF) may offer another framework from which this study's findings can be understood. While decoding mental states and other ToM skills reach maturation in early childhood, ECF abilities continue to develop well into adolescence (Huizinga et al., 2006; Stuss & Anderson, 2004). Mentalizing and executive functioning abilities may develop in tandem in the early years, yet diverge as environmental and other factors influence their continuing development, resulting in a decreasing association between ECF and mentalizing abilities. ECF may be vulnerable to substance abuse, depression and other disorders of adolescence and adulthood — as speculated in this study's other hypotheses — that may have significant neurocognitive consequences (Pferrerbaum et al., 1993, Tumeh et al., 1990, and Pascual-Leone et al., 1991). Reflective abilities may additionally be influenced by a number of factors, particularly trauma. Hypervigilance and states of arousal may limit the ability to reflect on mental states in others (Gabbard, et al, in press). In the case of attachment trauma, victims may rely on non-mentalizing modes of

representing reality (Fonagy, 2005), and cope with their experiences by avoiding reflecting on the mental states of their caregiver (Gabbard et al.). These sequelae to trauma may undermine developing RF. A significant number of the participants in the present study had trauma histories, such as experiences of sexual abuse (N = 17, 59%), and met current criteria for PTSD (N = 6, 21%). This may suggest that attachment traumas may have interfered with the mentalizing abilities of these mothers. Executive and mentalizing abilities may begin to disassociate in children as young as five years of age, as speculated by Pellicano (2007), who was unable to replicate the robust associations between ECF and ToM in older children that had been documented in preschoolers.

Understanding the relationship between RF and ToM

A central premise of this study is that RF and ToM are related constructs. The substantial literature supporting a relationship between ECF and ToM, and the latter construct's seeming relation to RF, made the study of the relationship between RF and ECF a natural extension of the literature. However, the lack of findings in the present study may offer important information about the relationship between RF and ToM, or the lack thereof. If ToM is related to ECF, but RF is not, then these two forms of mentalization may represent qualitatively different abilities. Clear and significant differences between the two constructs are evident in their respective literatures. ToM research has focused primarily on belief attribution and understanding behaviors in terms of thoughts and intentions, while RF theory has focused on mentalizing as an interpersonal process and a means of holding and regulating emotional experiences

(Pajulo et al., 2006). Distinctions have further been made with regard to their respective development, in which early mirroring and other experiences with caregivers are considered critical for RF development. ToM has alternatively been portrayed as developing out of an innate set of neurocognitive abilities. Despite these differences, however, both constructs are founded on metacognition and the ability to reflect on the mental states that drive behavior. It would be expected that RF and ToM would overlap in many respects, if not tap the same core mentalizing abilities. However, the findings in the present study may indicate that two qualitatively different forms of mentalizing exist.

Alternatively, the findings may also suggest that ToM and RF are related (e.g., RF is a more developed, inter- and intrapersonal form of ToM), yet that RF assessment measures the emotional, interpersonal aspects of metacognition and ToM the cognitive components. If it is the neurocognitive elements of mentalizing that are linked to ECF, present in both ToM and RF but only specifically measured by ToM tasks, then RF may, in fact, be linked to ECF. Support for this might emerge in future studies of "affective ToM" or "affective mentalizing," which has been found to be functionally and neurocognitively separate from the cognitive dimensions of ToM (Shamay-Tsoory et al., 2007; Shamay-Tsoory & Aharon-Peretz, 2007).

Depression and RF

An unexpected finding in the present study was the association between a history of depression and reflective functioning: mothers with a history of depression — defined as a current and/or past major depressive episode or dysthymia — had higher RF than

mothers without a history of depression. However, current depression, regardless of past history, was not linked to RF ability. Because the lifetime depression and current depression groups were similar in terms of their depressive features, an explanation of the findings is not readily apparent. Why would a past history of depression be linked to a greater reflective capacity? Do the mentalizing and cognitive aspects of RF — a more introspective, insightful cognitive style — put one at risk for depression? Or, conversely, does the experience of depression, and recovery from it, foster reflective ability? Could those in remission from depression be more likely to have had psychotherapy experiences, of which an outcome was a deepened ability to reflect on thoughts, feelings and mental states and consequently improved RF? A closer examination of the different depression groups — lifetime depression and current depression — is required to further explore these questions.

The "current depression" group — the group not significantly associated with RF — was composed of participants with current major depression or dysthymia, regardless of their depression histories; some only had current depression (N = 2), while others had current and past depressive episodes (N = 6). The "lifetime depression" group included participants with current depression (N = 8), past depression (N = 7) or both (N = 6). What differentiated the lifetime from the current depression group — and is therefore presumably responsible for the link between depression and higher RF — were participants who endorsed only past depression. These participants had past episodes of dysthymia or major depression but did not currently endorse symptoms of depression. A close visual examination of this group for variables that could account for higher RF

scores revealed little. Participants with past-only episodes did not differ in terms of demographic variables (i.e., IQ, education, etc.), depression severity, type of depression (i.e., dysthymia or major depressive episode), history of psychiatric hospitalizations, or other potentially related factors. However, more participants with past-only depressive episodes had a history of outpatient psychiatric treatment for depression (N = 7, 86%), than those currently depressed with a history of depression (N = 6, 50%) or those without such a history (N = 2, 50%). While these numbers must be viewed with caution due to the size of these groups, the study of psychotherapy intervention and RF may be a useful dialogue for their interpretation. Increased RF as a psychotherapy outcome is an idea that has been espoused by Fonagy and colleagues (Bateman & Fonagy, 2004; Fonagy, 1999; Fonagy & Target, 1999; Fonagy et al., 2002), who reference the therapist's own ability to mentalize about the patient's internal experience as likely to support developing reflective capacity. Verbalization of internal states, differentiation of feelings, and making anxiety-provoking internal experiences tolerable are among other core components of therapy cited as being critical to RF development. In support of this, a study of 36 patients with cannabis dependency randomized to either a 16-session supportive-expressive psychodynamic psychotherapy or control group conditions (self-help intervention) documented a statistical trend ($p < .07$) for higher RF in the treatment condition when comparing pre- and post-RF assessments (Middleby-Clements, 2002). Other studies, however, with similarly brief (i.e., 30 or fewer sessions) interventions, demonstrated either no RF improvement (see Karlsson & Kermott, 2006 for a review) or, surprisingly, a reduction in RF ability (Bernbach et al., 2000). In their study of RF development in a 30-session Brief Relational Therapy intervention, Bernbach and

colleagues found RF to decline in the group with good outcome and to remain stable in the poor outcome group. The authors attributed the decrease in RF to termination issues. The short-term nature of the interventions cited above may have further precluded the accurate appraisal of RF change in therapy. The slow, painstaking work of mirroring internal experience and use of other aspects of the therapeutic relationship would likely require more than three months of treatment for mentalizing improvements to take hold. Of the participants in the present study with a past history of depression (without current depression), five (72%) had 6 or more months of psychotherapy treatment, and the other two (29%), had five or more years of therapy[2]. Therefore, participants in the present study had markedly longer psychotherapy experiences than those in the above studies, indicating a greater opportunity to benefit from therapists' attempts to increase reflective capacity.

Another consideration relates to the degree to which this study's classification of depression is clinically useful. The SCID Mood Disorders module was used to assess past and present dysthymia and major depression. Subjects were labeled as depressed or not depressed (with some further classification, such as the timing of the depressed episode). No qualitative data regarding the quality and subjective aspects of sadness and depression were collected. Such data would have been useful in assessing a more reflective depression in contrast to a more physiologically-based episodes, and it's relationship to RF. Preliminary support for this comes from the work of Verhaeghen, Joormann and Khan (2005), who have empirically linked self-reflective rumination — a persistent

[2] Numbers represent cumulative time in psychotherapy, which may reflect continuous or multiple discrete treatment episodes.

mental focus on one's inner thoughts and feelings — to depression in a study of 99 graduate students. Accordingly, it is possible that the finding of higher RF in participants with a history of past depression was attributable to this reflective component of depression.

An alternate explanation is that these participants had higher RF from the start and were therefore more likely to seek and benefit from treatment. In other words, participants with higher RF in the past-only depression group may have had more outpatient psychotherapy experience because of core RF components — appreciation of internal experience, understanding behavior in terms of thoughts and feelings — that would make the appreciation and seeking out of psychotherapy more likely. No studies to date examine RF and help-seeking behavior or attitudes.

An important consideration regarding the lack of association found between RF and depression involves a significant limitation of the study design. The SCID and other mood disorder measures were administered earlier, often many months earlier, than when RF ratings were obtained. Information regarding changes in mood or depressive symptoms was not obtained at the time of PDI administration. Accordingly, it is possible that mood status changed by the second phase of the study, thereby decreasing the likelihood of a valid analysis of the association between RF and depression. This aspect of the study's design warrants skepticism about the findings of the relationship of RF to depression.

Depression and ECF

Executive deficits have been extensively documented in depressed patients. Specifically, impairment in inhibitory control and planning (Rush et al., 1983), response suppression (Channon & Green, 1999), and concept formation (Baker & Channon, 1995) have been linked to depressive conditions. In this study's sample of depressed subjects, however, ECF ability did not differ in subjects with lifetime depression diagnoses when compared to controls. This study's use of a non-clinical sample with limited depression severity might partially explain these findings. Additionally, despite a fairly even distribution of depression attributes, the small sample limited representation among different diagnostic groups. This would make it more difficult for influential aspects of depression to emerge as linked to ECF. While lifetime depression was not linked to ECF, secondary analyses examining the specific contributions of current depressive symptoms revealed a significant and positive correlation between current depression (regardless of past history) and ECF. Contrary to expectations, mothers with current depressed mood, anhedonia, poor sleep and other depressive symptoms had higher ECF scores than their non-depressed counterparts. One explanation for this may be that their depressive symptoms were of limited duration and therefore not capable of rendering ECF deficits. While this may explain limited ECF was not observed, as anticipated by the hypotheses, it does not explain why ECF was higher in this group of depressed mothers. One explanation may be that there may have been other correlates in this subgroup responsible for the association with higher ECF abilities. As detailed earlier, depressed mothers in this study showed significantly higher IQ ($M = 97.00$, $sd = 14.09$) than those without a history of depression ($M = 84.62$, $sd = 9.17$), $t(24.27) = 2.79$, $p < .01$).

Accordingly, the depressed group may have had other associated features that could be responsible for better executive capacities.

Substance Dependence and ECF

Analyses revealed no significant correlations between substance dependence and ECF. The executive capacities of mothers with lifetime substance dependence were not worse than those without histories of drug use. The lack of association observed was particularly unexpected due to the strong empirical literature documenting the deleterious effects of substance abuse on attentional control, concentration and other aspects of neurocognitive functioning (Grohman & Fals-Stewart, 2004; Verdejo-Garcia, Perales & Perez-Garcia, 2007). Sample characteristics, however, may offer insight into why ECF was relatively unaffected by histories of substance dependence. First, there was considerable heterogeneity of the sample in terms of the types of drugs used, frequency of use and other factors. For example, the "drug group" — those with current and/or past substance dependence diagnoses — was comprised of participants with markedly different patterns of use, drugs of choice and time periods during which they met dependence criteria. Accordingly, subjects with widely different patterns of use — e.g., an all day, every day crack-cocaine user and a former marijuana user with five years of abstinence — were grouped together. "Lifetime substance dependence" was likely too complex a variable for the potentially influential aspects of substance dependence to emerge in the analyses. Not only might potentially significant aspects of substance dependence have been too underrepresented to exert influence upon ECF, but other, non-significant co-existing factors may have tempered their influence.

Several studies support the above concern regarding sample diversity. Lilliquist and Bigler (1992) found that polysubstance users had impaired performance on ECF tasks while those with single drug dependencies did not. This was explained with a theory of neuropsychological compensation: the brain compensates for areas of impairment caused by single drugs by relying on intact areas of functioning; multiple drugs may incur generalized impairment of the central nervous system, preventing compensatory functions, thereby resulting in ECF impairments. The sample in the present study was widely diverse in terms of the number of substances used by participants — some consistently used single drugs while others maintained multiple drug dependencies — which may have precluded the influence of polysubstance dependence to emerge in the findings. A closer examination of the use patterns of the participants shows that more than half (N = 10) of the drug group met dependence criteria for two or more drugs. However, the two drugs most commonly co-abused were cocaine and crack-cocaine, which have the same fundamental chemical makeup and influence on brain function. Therefore, the majority of the participants in the present study abused single drug classes, which may help to explain the lack association between substance use status and ECF. Because most subjects abused drugs of the same chemical make-up and consequent affect on the CNS, it is possible that ECF was not significantly impacted by substance use due compensatory processes.

A related consideration involves studies documenting the near full cognitive recovery of formerly drug-dependent subjects. In the present study, current and past

substance abusers were grouped together in the "drug group" due to sample characteristics (i.e., few current substance abusers) and the literature indicating persisting neuropsychological deficits in currently abstinent drug users (Beatty, et. al., 1995; Mintzer, Copersino & Stitzer, 2005). Neuropsychological deficits have been documented to continue as long as five months following drug abuse treatment (Grant & Judd, 1976). However, studies of longer abstinence periods (i.e., median duration of 12 months) reported complete recovery of executive functions in former poly-drug users (Stevens et al., 2007). The findings of the latter study has greater application to the present study as the drug group primarily consisted of participants with a month or more, and in some cases many years, of abstinence. Accordingly, the lack of association between substance dependence and ECF may have been the result of significant abstinence periods during which cognitive recovery took place.

Substance Dependence and RF

Several studies have documented substance-abusing mothers to have low RF in relation to their children (Suchman et al., 2003, 2004; Truman, Levy & Mayes, 2004). The present study's inability to replicate these findings may have resulted from the differential timing of the assessment instruments. As detailed earlier, substance dependence and RF assessments took place at different times, often with many months in between, allowing for changes in substance use patterns and diagnostic classification. Due to the possibility that subjects classified as "controls" were later using substances at the time of the RF assessment, the validity of the associations examined between substance dependence and RF was compromised. Additionally, the diversity within the

substance-using group was further capable of influencing the findings. Substance use classifications were general and highly inclusive in order to include enough participants for analysis, lending to a highly heterogeneous group with regard to substance use patterns, thereby compromising the validity of the analyses.

A link between substance dependence and both reflective and executive abilities may have further been the result of response bias with regard to reporting of substance use. Participants in the present study may have denied or minimized drug use, or reported only past use, due to fears of study ineligibility and reports of child neglect. Urine toxicology would have been useful in determining substance use status of participants; substance use and history was based entirely on subject report. Self-report of substance use is significantly less than use corroborated by urine toxicology (Gorelick, 1989), even when substance users are not presented with reasons to distort their use (Lilliquist & Bigler, 1992). Without the verification of substance use, it will remain unclear as to whether ECF and RF were not associated because subjects in the control group (i.e., non-drug users) were current or past substance abusers, or because they are not linked in actuality.

Limitations of the Study

Interpretations should be tempered by an awareness of design and sample limitations. Many of the current study's limitations were mentioned throughout the discussion. Below is a review of these limitations, including additional concerns regarding the study's design, implementation and analysis.

The Sample

Heterogeneity

The heterogeneity of the sample with regard to substance use patterns and depression history was a significant limitation. Subjects were recruited by numerous sources and lacked unifying characteristics, such as similar psychiatric diagnoses or other clinical features. Accordingly, diagnostic groups were highly diverse in nature. The drug group, for example, included subjects with significant periods of abstinence, current use, heavy use, occasional use and intravenous drug use — all markedly different addiction patterns. Combined with the drawbacks of a small sample size, a diverse group of substance users may have presented many significant associated variables capable of decreasing the validity of the analyses.

Age of children and the PDI

The age of the referenced child in the assessment of RF is another possible study limitation. Participants in the present study were mothers of 9 to 15 year-olds. The PDI was designed and intended to assess representations of mothers of infant and young children. No studies to date have used the PDI to examine parental RF in mothers of pre- and early adolescent children. The design of the measure for a younger age group and lack of supporting data for it's applicability to older children raises the question whether the PDI questions effectively elicited material for participants to demonstrate RF. Some PDI questions, such as feelings about routine separations, may not be applicable to adolescents, while other questions may be relevant to their experience but not the most

salient to evoke affect-laden memories in the parent. Additionally, parental RF demands may change as one's child enters adolescence. An increasing need for psychological autonomy and identity exploration requires the parent to respond with flexibility and other changes (Sartor & Youniss, 2002). However, expectations of autonomy in adolescence may vary across ethnic groups. For example, Allen (1985) found African-American males to demonstrate group-centered goals (e.g., cooperation) in contrast to the individual-centered goals (e.g., independence) typical in the group of White males. Understanding ethnic influences upon autonomy, separation and other developmental aspects of adolescence is critical to understanding how corresponding changes in parental RF take place. In summary, possible developmental-specific RF demands for parenting adolescents and the applicability of the PDI questions to older children challenge the validity of RF rating in the present study.

Sample Size

One of the most salient and frequently addressed limitations in the present study was the small sample size. The total number of participants was 29, a small number that, given the heterogeneity of the sample and complicated nature of the constructs examined, likely impeded the validity of the present study's analyses.

Non-Clinical Sample

The use of a non-clinical sample was a further limitation of this study. Study hypotheses were studied in a group of urban mothers recruited from a hospital-based OB-GYN clinic and newspaper advertisements, representing a broad range of psychological

functioning. Additionally, RF varies most widely in psychiatric patients, making the unfortunately narrow range of RF scores in the present study understandable.

Study Design

Assessment of IQ, RF and Substance Dependence

The problem of accurate IQ assessment has been mentioned throughout the discussion. The combination of the WAIS Vocabulary and Information subtests may not have been a valid means of estimating IQ due to educational and cultural biases. Accordingly, verbal IQ may not have been sufficiently controlled for in the analysis of RF ability. A related consideration involves this study's reliance on a verbally-based measure of reflective capacity – the PDI. The PDI requires that subjects use mental state language and articulate thoughts and feelings in a way that may be vulnerable to educational influences. Potential response bias with regard to substance use was an additional limitation. Possible minimization or denial of substance use and lack of corroborating urine toxicology may have allowed for substance abusers to be among control group participants, thereby compromising the validity of the findings.

Clinical Implications

If RF was accurately appraised in the present study, despite the sample's educational and other limitations, then the findings are heartening: ECF abilities are able to develop and thrive in the context of poor RF. This suggests that there may be an intact cognitive framework that can be utilized as a basis for intervention for mothers in RF-focused treatment. For example, the capacity for abstraction may be used to bolster

developing RF, as in Pajulo and colleagues' (2006) treatment protocol for substance-abusing pregnant women. The authors use thinking into future and other seemingly ECF-based exercises, as a means of developing RF. If the findings of the present study are replicated, psychotherapeutic treatments could be further tailored to utilize "cognitive" aspects of mentalizing, such as problem-solving on the causes of behavior. Additionally, RF abilities that are reliant on more developed, psychological intuitiveness (e.g., appreciating ambiguity of feelings, the intra- and inter-relatedness of feelings) could become less of a therapeutic focus. Conceptually, these interventions could be seen as an intermediary step for RF development, a set of cognitive-focused interventions that could bolster fundamental metacognitive abilities.

For severely compromised mothers for whom RF-focused interventions are unsuccessful, adequate ECF abilities may provide an alternative skill-set for understanding behavior in terms of mental states. Problem-solving and other cognition-focused skills could potentially be utilized as a way of identifying the thoughts and feelings that give rise to their child's behavior. While this approach will not offer the emotion regulatory benefits that RF promises, it could help a caregiver to better understand and respond to her child's inner world of thoughts and feelings. Consider a hypothetical interaction between a mother, Nina, and her 8 year-old son, Anthony. Nina's thinking is organized and she demonstrates above-average capacity for attention, abstraction and other executive functions. However, her RF is limited; she lacks the ability to appreciate ambiguity in feeling, to perceive her son's feelings and behavior as related to her own and a metacognitive perspective of other dimensions of their

relationship. Her therapist has recently focused on her difficulty understanding Anthony's verbal outbursts as stemming from her depressed mood over the past few months. Integrating the concept of a cognitive-based means of understanding the psychological context of her son's behavior, she shifts to Nina's sharp ECF skills. When Anthony yells, Nina is encouraged to consider a list of possible causes of her son's behavior. As previously discussed in therapy, she wonders if he is tired, frustrated with school, or hurt by her depressed mood. These ideas don't come out of her emotional attunement with Anthony, or an intimate knowledge of mental states, but rather a cognitive exercise of trial and error that will help her better understand and respond to him. What one hopes is that Nina will learn to develop a substitute for reflective capacity, a cognitive understanding of what others without her limitations will know instinctively.

Suggestions for Further Research

While significant associations between RF and ECF were not found in the present study, further research addressing the limitations above is warranted. Specifically, a larger sample with 100 or more subjects, clearly defined diagnostic groups, and more sensitive and specific ECF measures is recommended. Examination of the relationships among ECF and RF component processes would be helpful in determining the relationship between these two constructs. A sample with established clinical conditions would be additionally worthwhile. Drawing subjects from treatment facilities ensures that subjects are fairly similar in terms of the nature of their condition (i.e., the majority of patients would endorse current depressive or substance dependence symptomatology). To adequately measure the influence of these diagnostic conditions on ECF and RF abilities,

it would be advantageous to have subjects with established diagnoses of a severity considerable enough to warrant treatment.

Conclusions

In a small sample of urban mothers, reflective functioning was not linked to executive functioning capacities. This finding may have been the result of a small, heterogeneous and non-clinical sample or other significant study limitations. Alternatively, the findings may indicate that mothers who struggle with poor RF may have intact higher-order cognitive functions on which alternative psychotherapeutic interventions can be based. The unique contributions of depression and substance dependence on executive and reflective capacities produced similarly unexpected results. Mothers with lifetime substance dependence diagnoses did not demonstrate poorer RF or ECF when compared to controls. A reliance on self-reported, uncorroborated accounts of substance use, as well as the possibility of the recovery of substance-induced neurocognitive deficits, may help to explain these findings. Depression was significantly linked to study variables: past depression was associated with higher RF, while current depression was linked to better ECF abilities. The timing of depressive episodes differentially affected executive and reflective functioning, however, the general association between depression and higher functioning was an unexpected finding that warrants further examination. Although speculative, the generally limited depression severity of the participants and the higher percentage of psychotherapy experiences among the significantly related depression groups are but two possible contributing factors to these results. Future research on the link between specific ECF and RF sub-

processes within a large, clinical sample would be additionally useful. If these constructs can be linked, then their vast respective literatures stand to greatly inform each other. The considerable work regarding the neurocognitive components of mental state attribution in ToM literature may enrich the understanding of a largely socially constructed and nurture-developed RF construct; RF can alternatively offer rich theory on the role of early childhood relationships and emotion in the development of mentalization. For the caregiver deprived of the self-regulatory and attachment-promoting aspects of RF, the preliminary findings of this study and future attempts to link these disciplines may offer hope. Though limited in her metacognitive abilities, a mother who struggles to understand her child may be less rigid and concrete as might be expected, and may have cognitive strengths for RF development or alternative parenting skills. She may not develop an intuitive and intimate knowing of what drives her child's behavior, but instead may develop a knowledge base and trial-and-error approach to understanding behavior as an alternate path to sensitive caregiving. In short, this may suggest that caregivers with poor reflective ability may not be uniformly limited, but rather have significant strengths capable of helping them to feel less overwhelmed, their children better understood, and their caregiver-child relationships enriched by more harmonized interactions.

Appendix: Demand Questions for Scoring Reflective Functioning on the PDI

Question	Probes
1. What gives you the most joy in your relationship with C (child's name)?	None
2. When do you feel most with C?	None
3. Do you ever feel intensely happy as a parent?	What kinds of situations make you feel this way? What kinds of effects do these feelings have of C?
4. Can you describe a time in the last week when you and C really clicked?	How did you feel when that happened? How do you think C feels when the two of you are really clicking?
5. Can you describe a time in the last week when you and C really weren't clicking?	What are those times like for you? How do you think C feels when the two of you are not clicking?
6. What gives you the most pain or difficulty in your relationship with C?	None
7. Do you ever feel really needy as a parent?	What kinds of situations make you feel this way?How do you handle your needy feelings? What kind of effect do these feelings have on C?
8. Do you ever feel really angry as a parent?	What kinds of situations make you feel this way?How do you handle your angry feelings? What kind of effect do these feelings have on C?
9. Do you ever feel really guilty as a parent?	What kinds of situations make you feel this way?How do you handle your guilty feelings? What kind of effect do these feelings have on C?
10. In an average day, what would you say gives C the most pleasure?	None
11. What distresses C or makes him or her unhappy?	None
12. Does C ever have moods or emotions that you sometimes have a hard time making sense of?	None
13. Are there times when you feel	

you don't understand your child?	None
14. Are there times in your relationship with C that you feel he or she has the upper hand?	How do you usually feel during those times?
15. Does C ever feel rejected?	None
16. How do you think C's relationship with you is affecting his or her personality or development?	None
17. Can you describe a routine separation?	How do you think C feels about this type of routine separation? What kind of reports do you get about his or her response while you are away? How do you think C feels when you return?
18. What are these routine separations like for you?	None
19. Could you describe the kind of separation that C might experience as more stressful than a routine separation?	How do you think C feels about these more stressful separations? What kind of reports do you get about his or her response while you are away? How do you think C feels when you return?
20. What are these more stressful situations like for you?	None
21. Has there ever been a time in your child's life when you felt as if you were losing him or her just a little bit?	None

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