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AUTONOMY SUPPORT, CONTROL, AND STRUCTURE AT DINNERTIME:  
CONTRIBUTIONS OF PARENTING AND TEMPERAMENT IN PREDICTING CHILD  
ADJUSTMENT

BY

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DISSERTATION

Submitted in partial fulfillment of the requirements  
for the degree of Doctor of Philosophy in Psychology  
in the Graduate College of the  
University of Illinois at Urbana-Champaign, 2010

Urbana, Illinois

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## Abstract

The current study examined parenting during family dinnertime in families with 5-year-olds and its concurrent and longitudinal associations with child adjustment. Child temperament was also examined as a moderator of these associations. Mothers' and fathers' autonomy support, control, and structure were observed during family dinnertime. Child temperament was assessed via structured observations in the home setting. Children's socioemotional adjustment was assessed via reports by non-parental caregivers at both 5 years and 5.5 years. Results suggested that parenting interacted with child temperament to predict concurrent and follow-up child adjustment as well as change in behavior problems over the 6-month period. Specifically, mothers' control was associated with more behavioral problems among children with high surgency, but fathers' control appeared to be beneficial for children with low surgency. Moreover, mothers' structure and fathers' autonomy support seemed beneficial for children with high negative affectivity, while mothers' control and mothers' and fathers' structure were related to more behavioral problems among children with low negative affectivity.

*For everyone who made this possible*

## Acknowledgements

My dissertation represents the completion of the degree and the end to my long journey in a graduate school. However, to me, it represents far more important things in my life than the completion of the degree. It represents a tremendous amount of help and support that my advisor, committee members, friends, and family have provided me over the past 7 years. It also represents the trust that they have continued to have in me throughout this long journey.

First and foremost, I would like to express my deepest gratitude to my advisor, Sarah Mangelsdorf. She has always been supportive, caring, and patient despite my struggle at the beginning of the graduate career. I would also like to thank Angela Wiley for providing guidance for my research including the master's thesis and continuously encouraging me to keep pursuing research on family functioning. I would also like to thank other committee members – Eva Pomerantz, Peggy Miller, and Connie Shapiro – for their insightful comments, diverse perspectives, and patience.

Many others have also made significant contributions to the conduction of this research project. I would like to give special thanks to my lab members, Maria Wong, Allison Jessee, and Dan Laxman. It has been such a rewarding experience to work with them closely and have conversations about a variety of professional and personal topics. My appreciation also goes to Stevie Schein and Kathy Anderson who regularly called so many families and scheduled home visits. I cannot thank Cindy Neff enough for her continuous moral and intellectual support and guidance especially in times of stress. I cannot forget to thank Eva Chen, one of my few best friends in Champaign, for always being there for me and providing moral support during this long journey. Extended thanks also go to the numerous undergraduate research assistants who helped with the coding and data collection – especially Andrea Gavidia, Ashley Soliday, Lauren Griffin, and Rachel Dickstein. I must also thank the families who participated in this study, who

graciously invited us into their homes and let us observe their dinnertime so we could better understand parental socialization during this special family time.

Last but not least, I would like to express my appreciation for my family and friends for their support and love. I am especially grateful to my husband, Seung-Gwon, for his unconditional support of my career pursuits and a lot of sacrifices he has made to make this happen. My son, Jin, may not even have a clue about what I was doing when I was not home (other than I was “studying”), but he always made everything okay with his big smile at the end of the day! Similarly, my parents in Japan may not fully understand what I have been doing in a foreign country. It was almost 10 years ago that I decided to come to the US and study psychology. Neither my parents nor I would have dreamed of me getting a Ph.D. back then! I have come this far, nonetheless, and the only reason why I came to the US in the first place is because my parents believed in me and encouraged me to explore my potential in a foreign country.

There are so many other people who have touched my life and changed me to be a better researcher, teacher, and person. My dissertation truly symbolizes the wonderful people by whom I have been surrounded.

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## Introduction

Parent socialization is the process through which parents implicitly or explicitly teach their children the values, knowledge, attitudes, and behaviors that are considered appropriate and desirable for their present and future roles in their particular culture (Parke & Buriel, 1998, 2006). Over the past decades, a number of researchers have sought to identify common parenting dimensions that all parents seem to show on certain levels and that can predict children's behavioral and emotional development.

One of the first systematic efforts to study parenting was Baumrind's research (1967, 1971, 1989). She extensively examined parenting behaviors and identified two major parenting dimensions: warmth and control. Based on the levels of these dimensions, Baumrind (1967, 1971, 1989) identified four parenting styles (i.e., authoritative, authoritarian, permissive/indulgent, rejecting/neglecting). Baumrind and other numerous researchers have used this typological approach and advanced our understanding of how parenting is related to child outcomes in different domains (e.g., Darling & Steinberg, 1993; Dornbusch, Ritter, Leiderman, Roberts, & Fraleigh, 1987; Steinberg, Elmen, & Mounts, 1989; Steinberg, Lamborn, Darling, Mounts, & Dornbusch, 1994). However, Baumrind's typological framework has been criticized for not making a distinction between different types of control and therefore failing to examine how they differentially or similarly influence children's development.

Schaefer (1965) was among the first to recognize two different forms of control: psychological control and behavioral control. According to Schaefer (1965), psychological control comprises "covert, psychological methods of controlling the child's activities and behaviors that would not permit the child to develop as an individual apart from the parent" (p. 555). Psychological control can be manifest in such parenting behaviors as constraining verbal

expressions, invalidating feelings, personal attacks, erratic emotional behavior (e.g., showing impatience with the child, changing moods when with the child), love withdrawal (e.g., being unresponsive to the child's psychological and emotional needs), and guilt induction (e.g., making the child feel guilty when disobeying) (e.g., Olsen et al., 2002). Behavioral control, on the other hand, is a type of control by which "the parent makes rules and regulations, sets limits to the child's activities, and enforces these rules and limits" (Schaefer, 1965, p. 555), which has a positive connotation unlike psychological control. Parents may exert this type of control on children's behavior through setting rules and limitations, monitoring (e.g., closely watching over the child's whereabouts), and maturity demands (e.g., verbally or nonverbally expressing expectations for certain behavior) (e.g., Barber, Stolz, & Olsen, 2005).

The distinction between psychological control and behavioral control, though first articulated by Schaefer in the 1960s, received little empirical attention for some time. However, in the past two decades, research on these two constructs of parental control has flourished especially since Steinberg (1990, Steinberg et al., 1989) revived Schaefer's work in 1965. One of the advances in the literature is "specialized" effects of each form of control on children's behavioral and emotional adjustment (Barber et al., 2005). Although some studies have found inconsistent results (e.g., Bean, Bush, McKenry, & Wilson, 2003; Hart, Nelson, Robinson, Olsen, & McNeilly-Choque, 1998), psychological control is generally associated with negative outcomes in *psychosocial* domains such as depression (Barber, 1996; Gerber, Robinson, & Valentiner, 1997), low self-esteem (Bean et al., 2003), and social withdrawal (Mills & Rubin, 1998). On the other hand, behavioral control appears to have a positive impact on *behavioral* domains of child/adolescent adjustment such as low substance use (Dishion & Loeber, 1985), low delinquency (Bean, Barber, & Crane, 2006; Patterson & Stouthamer-Loeber, 1984), and

fewer externalizing problems (Fletcher, Steinberg, & Williams-Wheeler, 2004; Gray & Steinberg, 1999).

Although psychological control and behavioral control appear to be meaningful, distinct constructs of parental control that predict child outcomes in various domains, this line of research has some methodological and conceptual limitations: 1) the limited age range of children studied, 2) narrow definitions of psychological and behavioral control, 3) confusion over the usage of the word “control,” and 4) lack of a theoretical framework. First, most of the studies mentioned above have focused on school-age children and adolescents (e.g., Bean et al., 2003, 2006; Gerber et al., 1997). Although increasing numbers of researchers have started to apply these constructs to the study of younger children (e.g., Dumas, LaFreniere, & Serketich, 1995; Hart et al., 1998; Olsen et al., 2002), applicability of these constructs to younger children remains still challenging, especially because coding systems and questionnaires are not designed for such age groups and therefore their validity is not yet well established for this age group (e.g., Olsen et al., 2002).

Second, psychological control and behavioral control have been conceptualized as relatively specific behaviors, resulting in a narrow definition of each construct. For example, psychological control has been operationalized in terms of psychologically relevant behavior such as love withdrawal and guilt induction. But in relatively well-functioning community samples, these behaviors may not be frequently used or observed (e.g., Mills & Rubin, 1998). Similarly, behavioral control has been commonly operationalized as parenting behavior toward children’s behavior or activities such as parents’ surveillance efforts to monitor their children’s (mostly adolescents’) whereabouts outside the home, which may not be a relevant parental behavior for younger children (e.g., Barber et al., 2005).

Third, the word “control” has been operationalized in so many different ways across studies that it often creates confusion over interpretations of results. Therefore, instead of inclusively using the word “control” and referring to psychological and behavioral control as “multiple forms” of control, Grolnick and Pomerantz (2009) suggest using “control” to exclusively refer to parents’ “pressure” (forcing the child to do things), “intrusiveness” (doing things for the child), and “dominance” (taking an adult-centered perspective) with respect to children’s emotion and behavior. Finally, the fourth limitation is that research on psychological and behavioral control is not guided by a specific theory, making it difficult to better understand underlying mechanisms of parent socialization (Grolnick & Pomerantz, 2009).

*Self-determination theory: Implications for children’s socioemotional development*

Self-determination theory (SDT: Deci & Ryan, 1985) offers a valuable theoretical framework for studying parenting and its implications for young children’s socioemotional development. Self-determination theory suggests that all human beings have three basic psychological needs: autonomy, competence, and relatedness. These three needs underlie intrinsic motivation, motivation to do tasks for sheer enjoyment that comes from within, and they can be fulfilled by different aspects of parenting behavior: autonomy support (versus control), structure, and warmth, respectively. In the current investigation, only autonomy support (versus control) and structure were considered because of its focus on parental control.

*Autonomy and autonomy support.* According to SDT, autonomy supportive behaviors can promote children’s sense of autonomy or “perceived locus of causality” (deCharms, 1968). In other words, autonomy support can help children to feel that they are in charge of regulating their own feelings and actions and making decisions for and by themselves, which in turn leads them to feel more intrinsically motivated to explore the environment. Autonomy supportive

parents are likely to encourage their children to initiate an action and solve problems on their own whenever possible, and give positive feedback and encouragement for their ongoing progress. In contrast, if parents provide an external force for children's behavior by taking a lead during a task, solving problems for children, and frequently giving them directives, children fail to develop organized and coherent sets of strategies to regulate their behavior and consequently become largely extrinsically motivated to pursue activities (Deci & Ryan, 1985).

It has been consistently shown that autonomy supportive parenting is associated with positive child outcomes across various domains of child functioning. In a psychosocial domain, Clark and Ladd (2000), for example, found that when mothers were autonomy supportive during conversations with their kindergarten children, children demonstrated more harmony in closest friendship and received higher peer acceptance. In an academic domain, Roth, Assor, Niemiec, Ryan, and Deci (2009) found that mothers' and fathers' autonomy support were positively associated with adolescents' sense of choice, which was in turn linked to adolescents' integrative regulation of negative emotions and interest-focused engagement in learning.

Controlling parenting, on the other hand, has been found to hinder the development of autonomy and ultimately intrinsic motivation at any developmental stage starting in infancy. For example, Frodi, Brodi, and Grolnick (1985) observed interactions between mothers and their infants playing with toys together at 12 months and again at 20 months. Results showed that infants of mothers who were highly controlling (e.g., taking the infant's arm to a part of a toy, giving many directives) at 12 months gave up more easily when encountered by a challenge and were less successful in manipulating toys or solving problems 8 months later. In a similar vein, Campbell, March, Pierce, Ewing, and Szumowski (1991) reported that mothers' controlling behavior during a clean-up task with their 2.5-4-year-olds was predictive of behavior problems a

year later. In another longitudinal study, Kochanska, Barry, Stellern, and O’Bleness (2009) found that both mothers’ and fathers’ power assertion at 2-3 years in dyadic discipline contexts predicted children’s resentful opposition (i.e., defiance, negative emotional tone, unresponsiveness) at 52 months and antisocial, disruptive behavior at 67 months. Positive effects of autonomy support and negative effects of control have also been demonstrated in China (Wang, Pomerantz, & Chen, 2007).

*Competence and structure.* The second psychological need is a sense of competence. It has been suggested that structure that parents provide for children to complete a task may help children feel competent and therefore enhance intrinsic motivation (Deci & Ryan, 1985; Grolnick, 2003). Maccoby and Martin (1983) also emphasized positive implications of structure for children’s self-regulation abilities. Therefore, structure is likely to help children not only accomplish the task at hand competently but also regulate their behavior and emotion consistently and effectively across situations.

Structure has been defined as “the provision of guidelines and information that children need so they can be self-determining” (Grolnick, 2003, p.17). Parents can provide structure for the child by monitoring the child’s behavior, setting rules and limitations, and following through on them (Grolnick, 2003), which also have been conceptualized as relevant aspects of behavioral control (Barber et al., 2005). Research on parental structure at young ages is strikingly scarce, but findings are consistent with those of behavioral control. For example, Grolnick and Ryan (1989) found that the provision of high structure (e.g., clear provision of rules and expectation and its consistency) assessed through an interview with parents was particularly important for elementary-school children’s better understanding of what controls their success and failure.

As discussed above, compared to the multiple-forms approach to control, self-determination theory provides a useful theoretical framework to study parents' autonomy support, control, and structure in early childhood. Nevertheless, this line of research still has some limitations. Specifically, most studies have primarily focused on mothers (e.g., Campbell et al., 1991; Clark & Ladd, 2000; Frodi et al., 1985) and main effects of parenting on child outcomes (e.g., Clark & Ladd, 2000; Grolnick & Ryan, 1989; Wang et al., 2007). Therefore, the current study included not only mothers but also fathers and considered a goodness-of-fit between parenting and child temperament to predict child adjustment.

#### *Differences between Mothers and Fathers*

Over the last three decades, a growing number of studies have shown that not only mothers but also fathers contribute to children's development. This heightened interest in fathers' roles may be partly a reflection of increases in paternal involvement over the past few decades in terms of time spent with children as well as emotional investment in childrearing (Lamb & Tamis-LeMonda, 2004; Parke, 2002; Pleck & Masciadrelli, 2004).

Much research on fathers has been focused on fathers' involvement in quantitative terms (e.g., *how much time* they spend playing with child or doing necessary childcare such as feeding, diapering) (see Pleck & Masciadrelli, 2004, for a review). Although fathers' *sensitivity* has been examined by an increasing number of researchers (see Lamb, 1997 for a review), other fathers' parenting behaviors that mothers also commonly enact, particularly autonomy support, control, and structure, have been studied by very few researchers. Still limited yet growing research, however, has provided insight into different socialization practices by each parent. For example, Power, McGrath, Hughes, and Manire (1994) visited families when everyone was home and observed them from the beginning of dinner to the target child's (2 to 6 years old) bedtime.

Although it is not clear if both parents were always present whenever one parent made an attempt to control the child's behavior, they found that mothers made more control attempts (similar to structure) than did fathers. Mothers also used more gentle techniques (e.g., affection, justification, minimization), while fathers exerted more direct pressures on the child's compliance (e.g., imperatives). Similarly, Volling, Blandon, and Gorvine (2006) examined how much each parent used gentle guidance (e.g., reasoning, polite requests, positive comments, suggestions) in the other parent's presence and found that mothers used more gentle guidance toward toddlers and preschoolers than did fathers. Power et al. (1994) and Volling et al. (2006) together suggest that in the presence of the other parent, mothers would provide more autonomy support and structure and less control than fathers.

In contrast, Pratt, Kerig, Cowan, and Cowan (1988) and Karreman, van Tuijl, van Aken, and Deković (2009) did not find a significant mean-level difference between mothers and fathers in scaffolding or structuring behavior they provided for preschoolers. Similarly, Barnett, Deng, Mills-Koonce, Willoughby, and Cox (2008) and Karreman et al. (2009) did not find a mean-level difference between parents in control but did find a significant correlation. It should be noted, however, that these studies examined mothers and fathers in the context of *dyadic* parent-child interactions, whereas the aforementioned studies (Power et al., 1994; Volling et al., 2006) that found a difference between mothers and fathers made observations of parenting when both parents were present (most of the time if not always). Therefore, when both parents interact with the child within the same context, a systematic difference between mothers and fathers would be expected such that mothers would exhibit more autonomy support and structure but less control than fathers.

If mothers and fathers are equally capable of socializing their children sensitively and effectively, the next question is, does the same behavior of mothers and fathers have the same implications for children's socioemotional adjustment? Past research seems to suggest otherwise. MacDonald and Parke (1984) examined how mothers and fathers separately interacted with their 3- to 4-year-old child during the 20-minute play session at home. They found that mothers' directiveness (e.g., giving the child commands) was positively associated with teacher ratings of popularity, whereas fathers' directiveness was related to lower popularity in preschools. In a study examining boys who were temperamentally highly negative (e.g., reactive and fearful) as infants, Belsky, Hsieh, and Crnic (1998) observed mothers and fathers in the house around dinnertime (whether mothers' and fathers' behavior were coded in the presence of each other is not clear) at 3 years, and they found a unique contribution of each parent to their son's adjustment. Mothers' negative parenting (i.e., a composite of intrusiveness and negative affect), but not fathers' negative parenting, was predictive of their son's externalizing problems. On the other hand, fathers' more negative parenting, but not mothers', predicted *less* inhibition. Although the authors found the result with fathers counter-intuitive, they reasoned that a little more push, which may appear to be intrusive and insensitive, might be more effective for reactive and fearful children to become less wary.

Given cumulating supportive evidence that both mothers and fathers serve as important socializing agents in different ways, the current study examined mothers' and fathers' specific socialization practices (as opposed to more global parenting behavior such as sensitivity) including autonomy support, control, and structure. Associations between parenting and children's socioemotional adjustment were then examined to explore similarities or differences in patterns of associations across parents.

### *Child temperament as a moderator*

Self-determination theory emphasizes parenting behavior as a supportive or undermining force for the development of autonomy and competence in children. This top-down, unidirectional model has been common in the socialization literature, viewing children as passive recipients of their environmental forces including parenting. Therefore, problems that children show are often viewed as due to “bad” parenting. In contrast with this view, temperament researchers suggest that children’s temperamental characteristics themselves can be risk factors for their later adjustment problems (e.g., Thomas, Chess & Birch, 1968). Thomas and Chess (1977), however, emphasized that an interaction, or a “goodness-of-fit,” between parenting and child temperament is the key to understanding children’s adjustment. Therefore, although controlling parenting can be directly associated with adjustment problems, its negative impact may also depend on children’s temperamental characteristics. Guided by Thomas and Chess’s (1977) goodness-of-fit model, an increasing number of researchers have examined not only direct associations between parenting and child adjustment but also moderating effects of temperament on this relationship (e.g., Belsky et al., 1998; Colder, Lochman, & Wells, 1997; Karreman et al., 2009; Mangelsdorf, Gunnar, Kestenbaum, Lang, & Andreas, 1990; Mangelsdorf & Frosch, 2000; Morris et al., 2002).

Based on Rothbart’s extensive work on the structure of temperament (e.g., Putnam, Gartstein, & Rothbart, 2006; Rothbart & Bates, 1998, 2006; Rothbart & Putnam, 2002), she and her colleagues determined that temperament is generally structured into three broad clusters: Surgency/Extraversion, Negative Affectivity, and Effortful Control.

*Surgency.* Surgency is composed of high impulsivity, high activity level, high high-intensity pleasure, and low shyness (e.g., Rothbart & Putnam, 2002), and it has been directly

linked to externalizing problems from preschool to preadolescent years (e.g., Eisenberg et al., 2009; Gunnar, Sebanc, Tout, DonZella, & van Dulmen, 2003; Mervielde, De Clercq, De Fruyt, & Van Leeuwen, 2005; Oldehinkel, Hartman, De Winter, Veenstra, & Ormel, 2004). Studies looking at moderating effects of surgency are still lacking compared to other temperament characteristics, but one of few studies was done by Colder et al. (1997). They found that 9- to 11-year-old boys high on activity level showed more aggressive behavior when their “primary” caregivers reported that they provided very poor supervision and monitoring. A similar finding was revealed in a recent study by Karreman and her colleagues (Karreman, de Haas, van Tuijl, van Aken, & Deković, 2010). They studied both mothers’ and fathers’ structure (referred to as “positive control” in the article), child temperament, and child adjustment at age 3. Although they found no direct concurrent association between structure and child socioemotional adjustment for either parent, they found a significant interaction between fathers’ structure and child impulsivity such that child impulsivity was positively correlated with externalizing problems only when fathers provided very little structure.

These findings suggest that clear guidelines and rules set by their parents may be particularly beneficial for highly surgent children especially because children who are high on surgency have been reported to exhibit strong approach tendencies (e.g., Derryberry & Reed, 1994; Rothbart, Ahadi, & Hershey, 1994; Rothbart, Derryberry, & Hershey, 2000). On the other hand, because highly surgent children have also been found to show aggression and frustration when their goals are blocked (e.g., Rothbart et al., 2000), controlling parenting behavior that intrudes children’s autonomy may be related to more behavioral problems among those children.

*Negative Affectivity.* Negative affectivity is often characterized by anger, fear, sadness, discomfort, and unsoothability (e.g., Rothbart & Bates, 2006; Rothbart & Putnam, 2002).

Children high on negative affectivity have been generally reported to develop more internalizing problems (Shaw, Keenan, Vondra, Delliquadri, & Giovannelli, 1997; Stifter, Putnam, & Jahromi, 2008), though its link to externalizing problems has also been found (Oldehinkel et al., 2004; Rothbart, Ahadi, Hershey, & Fisher, 2001). Some studies have demonstrated these children's even more heightened vulnerabilities for adjustment problems especially when faced with high levels of parental control. For example, Morris et al. (2002) found that maternal psychological control was concurrently associated with internalizing behavior among 7-year-old children who were high in irritable distress (e.g., easily getting angry when not being able to do or find what he or she wants), but not among less irritable children. Similarly, Belsky et al. (1998) found that mothers' intrusive parenting was more predictive of externalizing problems among 3-year-old boys who were highly reactive and fearful as infants than among those who were not. Karreman et al. (2010) replicated this finding with both mothers' and fathers' controlling behavior concurrently predicting more internalizing problems among 3-year-olds who were highly fearful.

Taken together, these findings suggest that children high on negative affectivity may be particularly reactive to controlling parenting and thus more prone to exhibit adjustment problems, while they may fare better with autonomy supportive parents who emphasize the child's perspective and respect his/her needs and wants.

*Effortful Control.* Effortful control is generally conceptualized as an executive control system that regulates one's attention and suppresses involuntary, reactive responses to complete a task at hand (e.g., Rothbart & Bates, 2006; Rothbart & Putnam, 2002). There is a considerable amount of evidence for effortful control as a protective factor against internalizing problems (Derryberry & Reed, 2002; Derryberry & Rothbart, 1988; Silk, Steinberg, & Morris, 2003) as well as externalizing problems (Eisenberg, Fabes, Guthrie, & Reiser, 2000). Negative

associations between effortful control and adjustment problems can also mean that low effortful control is a risk factor for maladjustment. Rubin, Hastings, Chen, Stewart, and McNichol (1998) indeed found heightened levels of externalizing problems among boys who were emotionally and behaviorally dysregulated (that resembles low effortful control) when their mothers were controlling and hostile. Karreman et al. (2009) also demonstrated that children with low effortful control showed more externalizing problems when given little parental structure compared to those with high effortful control. Therefore, one might hypothesize that children who lack the ability to control their attention would be expected to show more behavioral problems especially when parents are highly controlling and provide very little structure.

A few of the studies discussed earlier examining moderating roles of temperament have incorporated both mothers and fathers (e.g., Belsky et al., 1998; Karreman et al., 2009, 2010), but in general, such studies are still sorely lacking compared to the larger literature focusing exclusively on mothers. Thus, the current study included both mothers and fathers and investigated whether mothers' and fathers' parenting would interact with child temperament similarly or differently to predict child adjustment.

#### *Family dinnertime*

Family systems theory (Cox & Paley, 1997; Minuchin, 1985, 1988) suggests that each relationship and interaction context in the family has its own way of functioning. Therefore, what takes place and can be observed during parent-child relationships (e.g., parenting quality, attachment) is not the same as (though somewhat overlapping with) what can be observed and represented during whole family interaction such as family dinnertime. In fact, it has been documented that parenting changes in quality and quantity with and without the other parent present (e.g., Belsky, 1979; Belsky & Volling, 1987; Clarke-Stewart, 1978; Parke & O'Leary,

1976). Moreover, Craig (2006) found that when fathers spent time with their children, they were more likely to do so with their wives present than alone, making whole family interaction more normative as the context of father-child interactions.

Family dinnertime, for example, is one of the contexts where all family members get together and interact with one another. One of the obvious functions of dinnertime is to have a meal together, but dinnertime has been examined in terms of its variety of elements including communication styles, task accomplishment, and continuity of its practice. For example, families may communicate about what they did that day, the food they are presently eating, and what they are going to do in the future (Bohanek et al., 2009). From parents' perspective, tasks to accomplish at dinner may include serving and eating enough and healthy food, teaching table manners, setting and cleaning the table, and checking up on the child's behavior at school. These verbal and nonverbal behaviors or "routine" elements of dinnertime are all observable to outsiders, but they also carry more implicit and emotional meanings for family life and functioning, which represent "ritual" elements of this family practice (Fiese et al., 2002; Fiese, Foley, & Spagnola, 2006; Larson, Branscomb, & Wiley, 2006). How parents ask children about their day at school or how parents tell children to use manners at a dinner table may communicate respect for autonomy and emphasis on structure and limit setting. Therefore, family dinnertime provides a very unique context to observe mothers' and fathers' support for their children's autonomy and expectations for certain behavior from children.

#### *Current study*

Using self-determination as a theoretical framework, the current study examined mothers' and fathers' parenting practices, namely autonomy support, control, and structure, in the context of family dinnertime and their associations with child adjustment. Interactions

between parenting and child temperament were investigated in the prediction of child adjustment. Specifically, the study sought to answer the following questions: 1) Do mothers and fathers differ in the levels of autonomy support, control, and structure they provide during family dinnertime at 5 years of age? 2) Are mothers' and fathers' parenting similarly or differentially associated with children's emotional and behavioral adjustment concurrently as well as 6 months later? and 3) Does child temperament moderate the relationship between parenting and child adjustment concurrently and 6 months later above and beyond previous adjustment levels?

For the first question with respect to differences between mothers and fathers in their parenting, it was hypothesized that mothers would exhibit more autonomy support and structure but less control than fathers at dinner. This hypothesis was derived based on the findings by Power et al. (1994) and Volling et al. (2006) where mothering and fathering were observed with both parents present. In order to answer the second question, direct associations between parenting and child adjustment were examined at 5 years as well as at the 6-month follow-up. Based on self-determination theory, autonomy support and structure were expected to be concurrently associated with, and predictive of, fewer behavioral problems, whereas control was hypothesized to be associated with more behavioral problems. Studies that incorporated fathers, however, found different contributions of the same behavior by mothers and fathers to child adjustment (e.g., Belsky et al., 1998; MacDonald & Parke, 1984). Similarly, different behavior by mothers and fathers may also be related to the same child outcome.

Finally, the current investigation explored child temperament as a moderator of the association between parenting and child adjustment. Surgency is characterized by high approach and impulsive tendencies (e.g., Rothbart & Putnam, 2002). Thus, we hypothesized that controlling parenting, which blocks children' ongoing behavior, would be associated with more

externalizing problems for highly surgent children, while high levels of structure may help them to develop fewer behavior problems. For children high on negative affectivity, because they appear to be highly reactive to parental control (Belsky et al., 1998; Karreman et al., 2010; Morris et al., 2002), controlling parenting would be especially associated with higher levels of behavior problems for them, while autonomy supportive parenting may be associated with fewer adjustment problems. Based on prior research (Karreman et al., 2009; Rubin et al., 1998), it was hypothesized that high control and low structure would be associated with higher levels of problem behavior.

## Method

### *Participants*

Sixty-six families (34 boys, 32 girls) participated in this study when the target child was approximately 5 years of age ( $M = 4.9$  years,  $SD = 4.8$  months). They were recruited in the central Illinois areas as part of an ongoing longitudinal study through notices posted on campus, in grocery stores, newspapers, restaurants, birth preparation classes, and an electronic newsletter distributed to faculty and staff at the University of Illinois. Some families were recommended by participating couples who were asked to give contact information about other couples who may be interested in participating in the study. Twenty-three families were recruited before their child was born and have participated in previous phases of this project. Seventeen families were recruited when the child was about 1 year old; 3 families at 3 years of age; and 23 families at 5 years of age. Regardless of the timing of participation, when the child was near 5 years of age, the family was contacted to schedule a 2.5-3-hour home visit. In order to meet the criteria of inclusion for the study, couples had to be married or living together.

Mothers' ages ranged from 24.3 to 46.0 years with a mean age of 34.3 years ( $SD = 4.6$  years). Fathers' ages ranged from 26.4 to 54.7 years with a mean age of 37.2 years ( $SD = 6.1$  years). The number of siblings ranged from 0 to 3 ( $M = 1.2$ ,  $SD = .7$ ). Forty-five children were first-borns (8 of them were only children); 18 were second-borns; and 3 were third-borns. The mean family income at the time of our study ranged from \$61,000 to \$80,000 (overall range: less than \$10,000 to over \$100,000). In general, parents were highly educated: 0% of mothers and 5.9% of fathers had not completed high school; 1.5% of mothers and fathers had only completed high school; 4.5% of mothers and 5.9 % of fathers had some college education; 44.8% of mothers and 33.8% of fathers received a college degree; 49.2% of mothers and 53.0% of fathers

had a graduate degree. A majority of parents (80.9% of mothers, 79.4% of fathers) were European-American; 2.9% of mothers and 4.4% of fathers were Latino; 5.9% of mothers and 10.3% of fathers were African-American; and 10.3% of mothers and 5.9% of fathers were Asian or Asian-American.

### *Procedure*

When the target child was approximately five years of age, families were contacted (or recruited) to schedule a home visit conducted by one to two researchers. Approximately two weeks prior to the visit, families received a packet of questionnaires, which mothers and fathers independently completed. All completed questionnaires were collected during the home visit, and unfinished ones were sent back to the laboratory in a stamped return envelope.

During the 2.5-3-hour home visit, research assistants visited the family's home and videotaped various family interactions and child behaviors. In particular, this study focused on family dinnertime where mothers' and fathers' parenting behavior was observed. Based on mothers' reports, 85.7% of families had dinner together 4 days or more per week, and nearly half of the families (44.4%) had dinner together everyday. Overall, families had dinnertime with everyone present more than half of the week ( $M = 5.8$  days,  $SD = 1.6$ ). The duration of observed dinnertime ranged from 6 to 33 minutes ( $M = 18.6$  minutes,  $SD = 7.3$ ). In addition to dinnertime, the current study also focused on videotaped observations of child behavior during structured tasks designed to assess their temperament. All families were compensated for their participation by receiving a \$25 gift certificate to a local store.

During the visit, information of the child's non-parental caregiver (e.g., teacher, babysitter) was obtained in order to have another person's perspective on the child's adjustment. The non-parental caregiver received a \$10 gift certificate as compensation. Children's

adjustment was again obtained from their parents and teachers 6 months later via mail. Parents and teachers each received a \$10 gift certificate upon the arrival of their completed follow-up questionnaires.

### *Questionnaire Measures*

*Demographic information* (presented in Appendix A). Mothers and fathers independently completed a demographic questionnaire developed specifically for the current study. It provides information regarding parental age, education, family annual income, work (e.g., employment status, work hours), childcare arrangements, and family dinnertime arrangement (e.g., how often the whole family has dinner together).

*Child adjustment.* In order to assess non-parental perceptions of children's internalizing and externalizing problems at 5 years, non-parental caregiver/teacher reports were obtained via the Caregiver-Teacher Report Form of the Child Behavior Checklist for 1.5 to 5 years of age (C-TRF; Achenbach & Rescorla, 2000). This questionnaire was completed by a preschool/kindergarten teacher or someone other than parents such as a close family friend or a grandparent who knew the child well enough to report on a wide range of his or her behaviors in various domains. The C-TRF consist of 99 items on 3-point Likert scales (0 = *not true*, 1 = *somewhat or sometimes true*, 2 = *very true or often true*) and yield scores on internalizing problems (emotionally reactive, anxious/depressed, somatic complaints, withdrawn) and externalizing problems (attention problems, aggressive behavior). Raw scores were then converted to T scores based on the conversion table provided by the developers of the questionnaire. The questionnaire was completed by 5 non-parental/non-teacher figures, 52 preschool teachers, and 9 kindergarten teachers. One-way ANOVA revealed no difference among these three sources of reports of child adjustment. At or above the borderline clinical

range (60-63) were 13 children (19.7%; 10 boys, 3 girls) for internalizing problems and 11 children (16.7%; 5 boys, 6 girls) for externalizing problems. Cronbach's alphas for internalizing and externalizing problems were .80 and .67. The correlation between internalizing and externalizing problems were highly correlated,  $r = .61, p < .001$ .

Approximately 6 months after the visit, contact information for teachers was obtained from parents. Teachers received the same questionnaire as 6 months prior (C-TRF; Achenbach & Rescorla, 2000). Total scores for internalizing and externalizing problems were then converted to T scores. Because the data collection is still ongoing, subsequent analyses were conducted based on 52 (26 boys, 26 girls) out of 66 children. The follow-up questionnaire was completed by 1 non-parental/non-teacher figure, 16 preschool teachers, and 35 kindergarten teachers. Child adjustment did not differ by the sources of reports. Twenty-three children had the same teachers as before, and the remaining 29 children had different teachers at the 6-month follow-up. There was no difference in teachers' ratings of child adjustment between the same and different teachers at follow-up. Of 52 children, 6 children (11.5%; 3 boys, 3 girls) were at or above the borderline clinical range for internalizing problems, and 8 children (15.4%; 4 boys, 4 girls) for externalizing problems. Cronbach's alphas for internalizing and externalizing problems were .78 and .73. Internalizing and externalizing problems were moderately correlated,  $r = .52, p < .001$ . Compared to concurrent child adjustment, internalizing problems significantly decreased over the 6-month period,  $t(51) = 2.97, p < .01$ . Externalizing problems did not change over time.

### *Observational Measures*

#### *Child temperament (presented Appendix C)*

In order to obtain observational data on children's temperamental characteristics, we conducted a series of short tasks by using a preschool version of the Laboratory Temperament

Assessment Battery (Lab-TAB; Goldsmith, Reilly, Lemery, Longley, & Prescott, 1995). Five tasks, including *Pop-Up Snake*, *Attractive Toy in a Transparent Box*, *Beads Sorting*, *Snack Delay*, and *Popping Bubbles*, were administered by a trained research assistant in this fixed order to elicit a variety of behaviors and emotions from the child. The child was videotaped during these tasks. Parents were instructed not to be visibly present or actively interact with the child during the tasks. The whole procedure lasted approximately 25 minutes.

*Pop-up snake.* A toy snake was placed in a small box with a cover on top and dried Spanish moss on the bottom. As the experimenter was sliding the cover open, she introduced the snake to the child as friendly and encouraged the child to pet it. As the child reached the snake, the experimenter manipulated a stick attached to the snake so that the snake popped up a little. The experimenter repeated this procedure three times. If the child refused to pet the snake, the experimenter encouraged the child to pet it by ensuring that the snake is friendly and doesn't bite.

*An attractive toy in a transparent box.* The experimenter asked the child to choose one of the two toys (one girl-oriented toy, one boy-oriented toy) to play with. As soon as the child made a choice, the experimenter placed the chosen toy in a transparent box, locked the box with a padlock, asked the child to try a bunch of keys (none of them can actually open the box) to open the lock for 4 minutes, and left the child alone. Then, the experimenter came back and gave the child the right key to open the box, saying that she forgot to give the child that key. The child was let play with the retrieved toy for a few minutes.

*Beads sorting.* The experimenter showed the child a few hundreds of small beads in three different colors all mixed up in a large compartment of a box. Then, the experimenter asked the child to sort them by color into smaller compartments of the box for 3 minutes and left the child alone.

*Snack delay.* The experimenter placed a chocolate candy on a plate and put a transparent cup over it. The experimenter asked the child to wait until the bell rang to remove the cup and eat the candy. This process was repeated 6 times after one practice. The duration of waiting time was 20, 30, 0, 40, 10, and 60 seconds in this order. Whether or not the child ate the candy before the bell rang, the experimenter waited until the time was over to ring the bell and tell the child that she or he did or did not wait for the bell.

*Popping bubbles.* The experimenter started this task by introducing the child to a bubble-shooting toy. First, the experimenter showed how to use the toy and then let the child try it once. Next, the experimenter blew bubbles toward the child and asked the child to pop as many bubbles as possible with his or her elbows, feet, and hands in this order. The child had 3 trials to use each body part. At the end, the child played with the bubble-shooting toy a few times.

*Coding of the Lab-TAB.* For each of the five tasks mentioned above, two trained coders gave global ratings on a 4-point scale (0 = *little*, 1 = *some*, 2 = *moderate to high*, 3 = *very high*) for 4 discrete emotion codes and 6 behavioral codes. This global coding system was adapted from past research by Durbin, Hayden, and others (e.g., Durbin, Klein, Hayden, Buckley, & Moerk, 2005; Durbin, Hayden, Klein, & Olino, 2007; Hayden, Klein, & Durbin, 2005; Hayden, Klein, Durbin, & Olino, 2006). Four emotion codes are positive affect (e.g., laughter, smile, a positive tone of voice), fear, sadness, and anger. Six behavioral codes are interest, activity level, anticipatory positive affect (i.e., positive affect in anticipation of an event) (not coded for a transparent box and beads sorting tasks), involvement (e.g., persistence), compliance, and sociability (e.g., talkativeness, responsiveness to the experimenter).

*Interrater reliability.* Two coders overlapped on 63.8% of the tapes. Interrater reliabilities were established using gamma coefficients, which are considered more appropriate than Cohen's

Kappa for ordinal data (Hays, 1981; Liebetrau, 1983). The average gammas for each code across the 5 tasks were .86 for positive affect, .97 for fear, .88 for sadness, .93 for anger, .80 for interest, .93 for activity level, .82 for anticipatory positive affect, .83 for involvement, .91 for compliance, and .93 for sociability. All discrepancies were resolved through conferencing.

*Data reduction.* In order to reduce the number of codes for subsequent analyses, a principal component analysis was conducted by using the Varimax rotation method. Results revealed two components for children's emotional and behavioral patterns during the Lab-TAB tasks. The first component was comprised of positive affect, interest, activity level, anticipatory positive affect, and sociability. A composite variable was created by summing all these codes ( $\alpha = .87$ ). It explains 34.7% of the variance. It was labeled *Surgency* because it resembles the construct of surgency as defined by Rothbart (e.g., Rothbart & Bates, 2006),

The second component was comprised of fear, sadness, anger, involvement (reversed), and compliance (reversed). Thus, another composite variable was created by summing fear, sadness and anger and subtracting involvement and compliance ( $\alpha = .78$ ). It explains 30.0% of the variance. This variable is labeled as *Negative Affectivity* because of the major three negative emotions loaded on this component. However, it is important to note that when the principle component analysis was forced to extract three factors, the surgency factor remained the same, while the negative affectivity factor separated into two different factors with fear, sadness, and anger loaded on one and involvement and compliance on the other. This result suggests that using the two factor solution, the negative affectivity factor captures some aspects of effortful control, which is characterized by high attentional control and inhibitory control (e.g., Rothbart & Bates, 2006), as well as negative emotionality. Therefore, high negative affectivity represents

high levels of negative affectivity and low levels of effortful control, while low negative affectivity represents low levels of negative affectivity and high levels of effortful control.

*Parental autonomy support and control* (presented in Appendix D)

Each parent's autonomy support and control during family dinnertime was coded by two trained coders. During family dinnertime, the video camera was placed beside the dinner table such that everyone at the table was in the picture. Everyone in the family was at the table and spent as much time as they wanted to finish their dinner. The coding was conducted as long as both parents and the target child were present at the table.

The coding scheme was adapted from Grolnick's past work (Grolnick, Gurland, DeCoursey, & Jacob, 2002; Grolnick, Price, Beiswenger, & Sauck, 2007) with some minor modifications and additions. In every 10 minutes of dinnertime, coders recorded specific content codes (described below) and rated frequencies of these codes (1 = *never*, 2 = *infrequently*, 3 = *sometimes*, 4 = *fairly frequently*, 5 = *very frequently*). Using these ratings across intervals as a guide, coders then gave global ratings for how autonomy supportive and controlling the parent was verbally and nonverbally (1 = *extremely low*, 2 = *somewhat low*, 3 = *moderate*, 4 = *somewhat high*, and 5 = *extremely high*). In other words, each parent received 4 global ratings (verbal and nonverbal autonomy support and control). It should be noted that the distinction between autonomy support and control should be made based on the context where parenting behavior occurs, such as whether parents exert control over the child's behavior with or without the child's request for help (Grolnick et al., 2002). For example, providing help to accomplish the task following the child's request could be autonomy supportive, whereas the same behavior prior to the child's call for help could be controlling and hinder the child's feelings of autonomy and agency.

*Content codes.* For each 10-minute interval of dinnertime, coders recorded instances of 5 *verbal* content codes for autonomy support and 5 *verbal* content codes for control. Verbal content codes for autonomy support included 1) general feedback (e.g., “A great job eating all the vegetables!”) (note that feedback has to be directed at the child’s action initiated by the child her/himself, not at an action prompted by a parent), 2) solicited checking (e.g., helping the child remember a certain event upon his/her request, “I think it happened yesterday”), 3) request of the child’s opinion (e.g., “Do you want more pasta?”), 4) prompting the child for conversation (“How was your day at school?”), and 5) expanding the child’s conversation (e.g., “So, what happened to your friend after that?”). Verbal content codes for control included 1) directives (e.g., “Eat this broccoli.” “Use your spoon.”), 2) prohibitions (e.g., “Don’t eat like that.”), 3) unsolicited checking (e.g., asking whether the child is eating enough food even when the child is making progress), 4) interrupting the child in the middle of him/her telling a story, and 5) changing the child’s topic of conversation or explicitly negating the child (“No, it is not what happened”).

Coders also recorded instances of two *nonverbal* content codes for autonomy support and three *nonverbal* content codes for control for each 10-minute interval. The nonverbal autonomy support content codes included 1) nonverbal feedback (e.g., clapping hands as the child finishes the meal) and 2) solicited checking (e.g., assistance provided upon the child’s request). The nonverbal control content codes included 1) taking over (e.g., spoon-feeding the child, wiping the child’s mouth without the child’s request), 2) behavioral directives (e.g., pointing at the food to eat, placing food on the child’s plate without the child’s request), and 3) unsolicited checking (e.g., cutting food without the child’s request).

*Interrater reliability.* Two coders overlapped on 40.3% of the family dinnertime observations for mothers and 48.4% for fathers. For interrater reliabilities, gamma coefficients ranged from .94 to 1.00 for mothers ( $M = .97$ ) and from .83 to 1.00 for fathers ( $M = .95$ ). Percept agreement within .5 scale point ranged from 92% to 100% for mothers ( $M = 97.0$ ) and from 90% to 100% for fathers ( $M = 95.8$ ). All discrepancies were resolved through conferencing.

*Data reduction.* Nonverbal autonomy support showed a very low variability for both mothers ( $SD = .18$ ) and fathers ( $SD = .15$ ). In addition, verbal and nonverbal autonomy support were not significantly correlated for either parent. Therefore, nonverbal autonomy support was excluded from subsequent analyses, and verbal autonomy support was maintained by itself to represent each parent's overall level of autonomy support at dinnertime. For control, because verbal and nonverbal ratings were moderately correlated for both mothers ( $r = .53, p < .001$ ) and fathers ( $r = .57, p < .001$ ), their average ratings were used for subsequent analyses ( $\alpha = .57$  for mothers,  $\alpha = .71$  for fathers). Autonomy support and control ratings were kept separate because they were not correlated. This is consistent with empirical evidence suggesting that autonomy support and control are distinct constructs of parenting (e.g., Ng, Kenny-Benson, & Pomerantz, 2004; Silk, Morris, Kanaya, & Steinberg, 2003; Wang, Pomerantz, & Chen, 2007).

*Parental structure* (presented in Appendix E)

Another pair of trained coders coded parental structure during family dinnertime where autonomy support and control were also assessed. Mothers' and fathers' structure and limit setting (referred to as structure in short thereafter) was globally coded by using the coding system originally developed by Egeland and Sroufe (1983) and Sroufe, Jacobvitz, Mangelsdorf, DeAngelo, and Ward (1985) (see Frosch & Mangelsdorf, 2001 for their adaptation of the same coding system) on a 7-point scale (1 = *low*, 4 = *moderate*, 7 = *high*). Parental structure reflects

the extent to which parents are willing and able to establish their expectations for the child's behavior and to consistently and firmly follow through on these expectations. Parents who receive a high rating on structure may say to the child, "Can you talk when you finish eating the food in your mouth?" "Why don't you stay with us until everybody is done?" "You need to use your fork properly," or "Eat more vegetables." It is important to note that parents may provide structure and set limits in an autonomy supportive manner (such as the first two sample statements) or a controlling manner (such as the last two sample statements). How structure was provided, however, was not taken into account for structure ratings.

*Interrater reliability.* Two coders overlapped on 25.4% of mothers and 23.9% of fathers. For interrater reliabilities, gamma coefficient for structure was 1.00 for both mothers and fathers. Percent agreement within 1 scale point was 100% for both parents. All discrepancies were resolved through conferencing.

## Results

Analyses were conducted in several steps based on the primary research questions guiding this study. First, preliminary analyses were conducted to examine whether demographic characteristics were significantly related to parenting, child temperament, and child adjustment. Intercorrelations among the three parenting dimensions were also examined for each parent to see whether these dimensions were indeed independent of each other. Differences due to child gender and birth order (i.e., first-borns vs. later borns) were also explored in parenting, child temperament, and child adjustment. Second, correlational analyses were conducted to examine associations between mothers' and fathers' parenting to explore similarities and differences between parents. Mean-level differences between mothers' and fathers' parenting were also examined with *t* tests. For both correlational analyses and *t* tests, differences between mothers and fathers in families of boys versus girls were also explored. The third set of analyses was carried out to explore direct correlations between each parent's parenting and children's concurrent as well as follow-up internalizing and externalizing behavior problems. Finally, multiple hierarchical regression analyses (run separately for mothers and fathers) were conducted to examine whether parenting, temperament, and the interactions between the two would predict concurrent child adjustment at 5 years. Similar analyses were conducted to predict child adjustment 6 months later, and the residualized change in child adjustment over the 6-month period was examined by controlling for 5-year behavior problems.

### *Preliminary Analyses*

Descriptive statistics of all the continuous variables are presented in Table 1. Table 2 shows bivariate correlations between all the continuous variables and demographic variables. As can be seen in the table, mothers' education was positively associated with fathers' autonomy

support at dinner. Fathers' education was also related to higher levels of autonomy support by fathers. Interestingly, the larger number of siblings in the family was associated with lower autonomy support by mothers, and lower structure by mothers, and fathers. Fathers' education was negatively associated with children's negative affectivity. Family income was significantly associated with children's internalizing problems at the 6-month follow-up. Thus, it was controlled for in subsequent analyses. Similarly, fathers' education was also controlled for when predicting externalizing problems at follow-up because of the significant association between fathers' education and externalizing problems. It is important to note that the duration of observed dinnertime was not associated with any other studied variables including child adjustment. Therefore, it was not controlled for in any subsequent analyses.

Next, intercorrelations among autonomy support, control, and structure of each parent were explored (see Table 3). Autonomy support was moderately correlated with structure for both mothers,  $r = .39, p < .01$ , and fathers,  $r = .45, p < .01$ , but autonomy support was not correlated with control for either parent. The correlation between control and structure was marginally significant for both mothers,  $r = .22, p < .10$ , and fathers,  $r = .23, p < .10$ .

Independent-samples  $t$  tests were conducted to examine mean-level differences in parenting, temperament, and child adjustment as a function of child gender (34 boys, 32 girls) and birth order (45 first-borns, 21 later-borns). The analyses of gender differences revealed that boys were found to show higher levels of surgency than girls,  $t(64) = -2.54, p < .05$ . The analyses of birth order revealed that both mothers and fathers of first-borns provided more autonomy support to their children than did parents of later-borns ( $t(64) = 2.39, p < .05$  for mothers,  $t(64) = 2.26, p < .05$  for fathers).

#### *Differences between Mothers' and Fathers' Parenting*

When correlations between mothers' and fathers' parenting behavior were examined, results revealed that mothers' and fathers' autonomy support were not significantly correlated, even when parents of boys versus girls were examined separately. In contrast, mothers' and fathers' scores on control were moderately correlated,  $r = .44, p < .001$ , and mothers' and fathers' scores on structure were modestly correlated,  $r = .28, p < .05$ . When parents of boys and those of girls were examined separately, results revealed the correlation for control was somewhat greater for girls,  $r = .63, p < .001$ , than for boys,  $r = .34, p = .05$ , although a Fisher's  $r$  to  $Z$  transformation indicated that this difference was only marginally significant. The correlation between mothers' and fathers' structure was significant for girls,  $r = .43, p < .05$ , but not for boys,  $r = .14, p = .44$ , but these two correlations did not significantly differ from one another.

When mean-level differences between mothers and fathers were explored by  $t$  tests, only structure differed: Mothers provided more structure than did fathers during dinnertime,  $t(65) = 3.26, p < .01$ . In order to explore child gender effects, parents of boys versus girls were examined separately. Results showed that mothers provided more autonomy to their sons than fathers did,  $t(33) = 2.43, p < .05$ . On the other hand, mothers exhibited higher levels of control,  $t(31) = 2.42, p < .05$ , and structure,  $t(31) = 3.08, p < .01$ , with girls than fathers did.

#### *Analyses Predicting Child Adjustment*

*Correlations between parenting and child adjustment.* Fathers' structure at dinner was concurrently associated with *more* externalizing problems,  $r = .24, p < .05$ . This correlation was not significantly different from the correlation between mothers' structure and concurrent externalizing problems, which was not significant,  $r = .13, ns$ . When this association was examined by gender of the child, it was found to only be true for boys,  $r = .44, p < .01$ , but not for girls,  $r = .03, ns$ . When 6-month follow-up child adjustment was examined (based on 52 out of 66

children), mothers' structure was also associated with *more* externalizing problems 6 months later,  $r = .35, p < .05$ . This correlation did not significantly differ from the one between fathers' structure and follow-up externalizing problems,  $r = .07, ns$ . This correlation was identical for boys and girls, but it became a trend when boys ( $r = .36; p < .10$ ) and girls ( $r = .36; p < .10$ ) were examined separately due to a loss in statistical power. Finally, fathers' autonomy support was associated with fewer internalizing problems,  $r = -.32, p < .05$ . This correlation was marginally significantly different from the correlation between mothers' autonomy support and internalizing problems at follow-up,  $r = .02, ns$ . This finding seemed only applicable for girls,  $r = -.43, p < .05$ , but not for boys,  $r = -.09, ns$ .

*Regression analyses predicting concurrent child adjustment.* Next, hierarchical regression analyses were conducted to investigate direct and interacting contributions of parenting and child temperament to predict concurrent child adjustment. All independent variables were first centered (using deviation scores) to reduce multicollinearity. Mothers' and fathers' autonomy support, control, and structure were entered one at a time in the first step of a regression equation predicting concurrent internalizing and externalizing problems. Child temperament was entered in the second step. An interaction term between parenting and child temperament was entered in the final step. If an interaction term was significant, post-hoc plotting was conducted based on procedures outlined by Aiken and West (1991).

Results revealed no main effect of parenting or temperament in any regression model predicting concurrent child adjustment. However, there were three significant interactions, and all of them involved negative affectivity. One interaction emerged between mothers' structure and negative affectivity predicting internalizing problems,  $\beta = -.26, p < .05$ . The overall model was also significant,  $F(3, 62) = 2.92, p < .05, R^2 = .12$  (see Table 4). In addition, fathers'

autonomy support interacted with negative affectivity in the prediction of concurrent internalizing problems,  $\beta = -.26, p < .05$ , in the context of a significant overall model,  $F(3, 62) = 2.92, p < .05, R^2 = .12$  (see Table 5). When both interactions were plotted for further interpretations, a similar pattern of interaction emerged: A slope of the regression line representing high negative affectivity was significantly (or marginally significantly) different from zero, but not a slope of the regression line representing low negative affectivity. This suggests that mothers' structure and fathers' autonomy support at dinnertime were concurrently associated with fewer internalizing problems only for children high on negative affectivity (see Figure 1 and 2).

Mothers' structure also interacted with negative affectivity, but in this interaction, it predicted *externalizing* problems,  $\beta = -.31, p < .05$ , in the context of a significant overall model,  $F(3, 62) = 2.97, p < .05, R^2 = .13$  (see Table 6). As Figure 3 shows, a significant association between mothers' structure and externalizing problems was only present when children were low on negative affectivity, such that mothers' structure was associated with *more* externalizing problems of children low on negative affectivity. In order to better understand this interaction, each one of the temperament codes that comprised negative affectivity (i.e., fear, sadness, anger, involvement, compliance) was examined separately. Results suggested that a positive association between mothers' structure and externalizing problems was primarily driven by children who scored low on sadness ( $\beta = -.33, p < .01$ ) and high on compliance ( $\beta = .34, p < .01$ ).

*Regression analyses predicting follow-up child adjustment.* The second set of regression analyses was conducted to investigate whether parenting, child temperament, and an interaction between the two would predict child adjustment 6 months later. Analyses were conducted on the data of 52 out of 66 children that had been collected at the time of the analyses. Family income

was entered first as a covariate in a regression model predicting internalizing problems. Similarly, fathers' education was entered first as a covariate when predicting externalizing problems. One of the parenting variables (i.e., autonomy support, control, and structure) was entered in the second step, followed by temperament. In the final step, a parenting  $\times$  temperament interaction term was entered.

Some of the parenting variables and both temperament variables emerged as main effects on child adjustment at the 6-month follow-up (note that these regression tables were not put into tables unless an interaction was significant). For mothers' parenting, mothers' structure was significant,  $\beta = .32, p < .05$ , in a regression model with surgency predicting externalizing problems,  $F(4, 47) = 3.51, p < .05, R^2 = .23$ . Mothers' structure was also significant,  $\beta = .33, p < .01$ , in a regression model with negative affectivity predicting externalizing problems,  $F(4, 47) = 6.09, p < .001, R^2 = .34$ . Fathers' control was significant,  $\beta = -.30, p < .05$ , in the regression model with surgency predicting internalizing problems,  $F(4, 47) = 5.11, p < .01, R^2 = .30$ . In addition, negative affectivity was significant in all the models predicting internalizing problems: Beta ranged from .31 to .44;  $p$ 's ranged from .05 to .01. Overall models were also significant:  $F(4, 47)$  ranged from 3.64 to 4.17;  $p$ 's ranged from .05 to .01;  $R^2$  ranged from .24 to .26.

When interactions terms were explored, results revealed four significant interactions. Two of the interactions involved parental control and children's surgency. One interaction was between mothers' control and surgency in the prediction of externalizing problems,  $\beta = .30, p < .05$ , in the context of a significant overall model,  $F(4, 47) = 3.77, p < .05, R^2 = .25$  (see Table 7). As can be seen in Figure 4, a slope of the regression line representing high surgency was significantly different from zero, but not the one representing low surgency, indicating that a

positive association between mothers' control and externalizing problems at 5.5 years was only significant when children were highly surgent.

In addition, another significant interaction with surgency emerged. Fathers' control interacted with surgency when predicting internalizing problems,  $\beta = .50, p < .01$ . The overall model was also significant,  $F(4, 47) = 5.11, p < .01, R^2 = .31$  (see Table 8). In contrast with the previous interaction with mothers' control interacting with surgency, not only was fathers' control predictive of more internalizing problems for highly surgent children, but it was also predictive of *fewer* internalizing problems for children with low surgency (see Figure 5).

An interaction between mothers' control and negative affectivity was significant,  $\beta = -.30, p < .05$ , in a significant overall model,  $F(4, 47) = 4.49, p < .01, R^2 = .29$  (see Table 9). A similar moderating effect of negative affectivity was also found on the association between fathers' structure and externalizing problems,  $\beta = -.28, p < .05$ , in the context of a significant model,  $F(4, 47) = 4.07, p < .01, R^2 = .26$  (see Table 10). Plotted graphs of both interactions showed the presence of a significant, positive association between mothers' control or fathers' structure and externalizing problems only when children were low on negative affectivity (see Figure 6 and 7). In other words, mothers' control and fathers' structure predicted more externalizing problems 6 months later only when children exhibited low levels of negative affectivity. When each temperament variable that comprised negative affectivity was examined separately, results suggested that the positive association between mothers' control and externalizing problems at follow-up was primarily driven by children who scored high on involvement ( $\beta = .30, p < .05$ ) and compliance ( $\beta = .27, p < .05$ ). Similarly, the positive association between fathers' structure and externalizing problems at follow-up was only present when children were high on compliance ( $\beta = .27, p < .05$ ).

*Regression analyses predicting change in behavioral problems from 5 to 5.5 years.* The final set of regression analyses was performed to examine whether parenting, temperament, and an interaction between the two would predict child adjustment 6 months later above and beyond the previous adjustment, or in other words, a residualized change in child adjustment from 5 to 5.5 years. The order of the variables entered in a regression model was exactly the same as described earlier, except that prior child adjustment at age 5 was also entered along with the covariate.

Two regression models revealed main effects. Surgency was significant,  $\beta = -.24, p < .05$ , in a regression model with mothers' structure predicting internalizing problems,  $F(5, 46) = 10.06, p < .001, R^2 = .52$ . Negative affectivity was significant,  $\beta = .25, p < .05$ , in a regression model with mothers' autonomy support predicting internalizing problems,  $F(5, 46) = 10.06, p < .001, R^2 = .52$ .

The significant interactions that emerged were with controlling behavior. One interaction was between mothers' control and children's surgency in the prediction of *externalizing* problems above and beyond the prior levels of adjustment,  $\beta = .23, p < .05$ . The overall model was also significant,  $F(5, 46) = 10.36, p < .001, R^2 = .53$  (See Table 11). As shown in Figure 8, mothers' control was only predictive of an increase in externalizing problems for highly surgent children. Fathers' control also interacted with surgency, but in the prediction of a residualized change in *internalizing* problems (as opposed to externalizing problems with mothers' control),  $\beta = .30, p < .05$ , in the context of a significant overall model,  $F(5, 46) = 11.78, p < .001, R^2 = .56$  (See Table 12). Unlike the previous interaction with mothers' control, Figure 9 indicates that fathers' control only predicted a decrease in internalizing problems for children who were *low* on surgency.

An additional significant interaction emerged between mothers' control and negative affectivity when predicting externalizing problems,  $\beta = -.28, p < .01$ , with a significant overall model,  $F(5, 46) = 11.55, p < .001, R^2 = .56$  (See Table 13). Figure 10 indicates that when mothers were highly controlling during dinnertime, only children low on negative affectivity developed more externalizing problems above and beyond their previous levels of behavior problems 6 months earlier. A follow-up analysis was conducted by decomposing the composite variable of negative emotionality. Results revealed that the positive association between mothers' control and externalizing problems was only true for children who were high on involvement ( $\beta = .28, p < .01$ ) and those who were high on compliance ( $\beta = .23, p < .05$ ).

## Discussion

Using the framework of self-determination theory, the current study contributes to the socialization literature by examining both mothers' and fathers' autonomy support, control, and structure during dinnertime in families with 5-year-old children. Specifically, it explored differences between mothers and fathers in their socialization practices, concurrent and 6-month longitudinal associations between parenting and child adjustment, and temperament as a moderator of these associations.

### *Distinct versus Overlapping Constructs of Parenting Behavior*

Although exploring similarities and differences among autonomy support, control, and structure was not the focus of this study, it should be noted that the current study found that autonomy support and control were distinct constructs for both mothers and fathers. This finding indicates that the presence of autonomy support does not mean the absence of control, and vice versa. Although the distinction between autonomy support and control has been reported elsewhere (e.g., Ng et al., 2004; Silk et al., 2003; Wang et al., 2007), the current study extends this finding to younger ages, fathers, and a non-dyadic interaction context.

Interestingly, structure and autonomy support were moderately correlated for mothers and fathers, whereas structure and control were only marginally correlated for both parents. This is unlikely to be an artifact of the coders' bias or tendency to group positive (or negative) things together because structure was coded by different coders from those who coded autonomy support and control. Instead, it appeared that the parents in the current study might have provided structure in a manner that was more autonomy supportive than it was controlling.

### *Differences between Mothers and Fathers*

One of the main goals of this study was to explore differences between mothers and fathers in autonomy support, control, and structure. Results revealed a mean-level difference only in structure: Mothers provided more structure than did fathers for their 5-year-old children. Studies that examined mothers and fathers separately in dyadic parent-child relationships found no mean-level difference between parents in structure (Karreman et al., 2009; Pratt et al., 1988). However, our findings in the current study are consistent with the work by Power et al. (1994) and Volling et al. (2006) that examined mothers' and fathers' structuring behavior when both parents were present. One of possible reasons why mothers may have provided higher levels of structure than fathers is that as fathers watched their wives providing and enforcing rules and limitations during dinner, they may have felt it less necessary to do the same. Indeed, second-order effects are a well known phenomenon in the developmental literature: When both parents are present interacting with the child within the same context, the amount of interaction each parent exhibits tends to decrease in quantity and quality (e.g., Belsky, 1979; Belsky & Volling, 1987; Clarke-Stewart, 1978; Parke & O'Leary, 1976). In addition, there is empirical evidence suggesting that fathers are more likely to be affected by the presence of the other parent. For example, Gjerde (1986) found that the presence of fathers improved the quality of mother-child relationship, whereas the presence of mothers hindered the quality of father-child relationships. Leaper, Anderson, and Sanders (1998) also found that mothers consistently exhibited more verbal communication than did fathers in both dyadic and triadic contexts.

Interestingly, mothers' and fathers' control were moderately correlated, and there was no mean-level difference between the two, suggesting that mothers and fathers exhibited comparable levels of control during family dinnertime. This finding is *inconsistent* with the findings of the investigations by Power et al. (1994) and Volling et al. (2006), in which fathers

exhibited higher levels of control than mothers when both parents were present. However, our findings were consistent with those of Barnett et al. (2008) and Karreman et al. (2009), who found comparable levels of control by mothers and fathers in the context of dyadic parent-child interactions. It was somewhat puzzling why in the current study we did not obtain similar findings to the other studies that have focused on parenting behavior during family interaction. However, these differing patterns of results could simply be due to a different operational definition of parental “control.” For example, Power et al. (1994) focused on directiveness, which was one of the several other aspects of controlling parenting in the current study. Similarly, Volling et al. (2006) investigated general discipline, in which autonomy support is embedded in structure (i.e., structure delivered in an autonomy supportive manner). On the other hand, controlling parenting in the current study was fairly similar to “negative parenting” in Barnett et al. (2008) and “negative control” Karreman et al. (2009).

Another possible explanation for cross-parent consistency in control is that mothers and fathers might have modeled each other’s controlling behavior. Support for this explanation can be obtained from the findings by Barnett et al. (2008). They did not find a significant correlation between mothers’ and fathers’ sensitivity, while they did find a significant correlation between mothers’ and fathers’ control. Moreover, they found that mothers’ and fathers’ intrusive parenting were equally likely to influence the other parent’s intrusive behavior, suggesting the more contagious nature of controlling behavior across relationships compared to other parenting dimensions such as sensitivity. Strong cross-situational consistency and developmental continuity of controlling behavior have also been demonstrated by other studies (Holden & Miller, 1999; Roberts, Block, & Block, 1984). Future research should further explore the extent to which one parent’s controlling behavior influences the other parent’s.

### *Main Effects of Parenting on Child Adjustment*

Another important goal of the current investigation was to examine main effects of parenting behavior on child adjustment. Specifically, parental structure was expected to be associated with fewer adjustment problems (particularly behavioral problems). Instead, fathers' structure was concurrently associated with *more* externalizing problems particularly among boys. Although this finding was somewhat surprising given past findings (Grolnick & Ryan, 1989), it is possible that fathers in the current study may have simply responded to the child's current problem behavior by enforcing more structure during dinnertime. However, the positive association between mothers' structure and externalizing problems 6 months later ran counter to our hypotheses.

Future research should explore whether this finding regarding parental structure and behavioral problems replicates, and also whether it is specific to children of this age. Perhaps, there is something particularly challenging about parental structure for children as they transition to kindergarten, as many of the children in this study were doing. In fact, a follow-up analysis indicated that the positive association between mothers' structure and externalizing problems at follow-up was only significant for children who were in kindergarten at follow-up ( $N = 35$  out of 52),  $r = .50, p < .01$ . On the other hand, it was not significant for those who were not in kindergarten yet,  $r = .01, p = .97$ . It has been well-documented that the transition to kindergarten entails a variety of challenges for children such as an increased focus on academic success and independence (e.g., Rimm-Kaufman, Pianta, & Cox, 2000) and therefore brings about a great amount of stress (e.g., Burts, Hart, & Kirk, 1990). Therefore, parents' well-intended structuring behavior might become too much for children to process on top of everything else going on at school. More research is needed to examine parents' structuring behavior over a longer period of

time and explore how the magnitude and direction of the impact of parental structure on child adjustment may change at different developmental periods.

As expected, the current study revealed a negative association between fathers' autonomy support and internalizing problems at the 6-month follow-up, particularly among girls. This finding is consistent with the findings from previous studies suggesting positive effects of autonomy support on children's socioemotional functioning (e.g., Clark & Ladd, 2000; Grolnick et al., 2002; Roth et al., 2009; Wang et al., 2007). Moreover, as Barber et al. (2005) suggested with respect to "specialized" effects of psychological and behavioral control, autonomy support appeared to be particularly relevant for children's emotional adjustment. Surprisingly, the main effect of fathers' autonomy did not emerge as significant in regression models predicting either follow-up child adjustment or a residualized change but was only significantly related to concurrent levels of behavior problems at 5 years of age.

It is interesting to note that in the current investigation, fathers' autonomy support and structure appeared to have differential effects on boys and girls, whereas mothers' structure appeared to have a similar impact on boys and girls. Although the current study did not find any difference between fathers' parenting of boys and girls, boys and girls may have responded to the same fathering behavior differently. It would be interesting to explore further these different effects of fathers' socialization practices on boys versus girls.

#### *Child Temperament as a Moderator*

The third major goal of the current study was to explore whether and how child temperament would serve as a moderator of the association between parenting and child adjustment. Regression analyses were conducted to predict concurrent child adjustment, 6-month follow-up child adjustment, and the residual change in child adjustment from 5 to 5.5 years of

age. Results seem to suggest that regardless of the outcome variable being examined, there are three general patterns of interactive effects of temperament: 1) Mothers' control was particularly relevant for the development of behavior problems among children with high surgency (Figure 4 and 8), but fathers' control appeared to be related to fewer internalizing problems for children who were low on surgency (Figure 5 and 9); 2) Mothers' structure and fathers' autonomy support were particularly beneficial for the emotional adjustment of children with high negative affectivity (Figure 1 and 2); and 3) Mothers' and fathers' structure and mothers' control were associated with higher levels of behavior problems for children who were low on negative affectivity (Figure 3, 6, 7, and 10).

Based on studies by Colder et al. (1997) and Karreman et al. (2010), it was expected that *low* levels of parental structure would be particularly related to more behavioral problems among children high on surgency. Although the results did not reveal such an interaction, highly surgent children still exhibited more externalizing problems at the 6-month follow-up when receiving high levels of *control* from either parent during dinnertime. We also found an increase in externalizing problems among children with high surgency when their mothers were highly controlling 6 months earlier. The presence of a positive association between controlling parenting and externalizing problems only for highly surgent children is in line with temperament research indicating that children with high activity level and strong approach tendencies are more prone to externalize their frustration and aggression when they cannot attain their goals (Rothbart et al., 2000; Rothbart & Putnam, 2002). Controlling parents are likely to tell the child what to do or not to do rather than praising the child's ongoing progress. Thus, it is possible that children who are highly active and exploratory may become more rebellious in the face of high control.

In contrast with mothers' control, fathers' control was *negatively* associated with *internalizing* problems of children with low surgency. The protective role of fathers' control for children with low surgency may be somewhat surprising, but findings by Belsky et al. (1998) reveal similar patterns. They found that fathers' intrusive parenting behavior was predictive of *less* inhibition among 3-year-old boys who were highly fearful and reactive in infancy. They reasoned that fathers' negative parenting may have encouraged these children to more actively interact with their environment and thus helped to reduce inhibition. Although low surgency is not equivalent to negative affect (e.g., Rothbart & Putnam, 2002), controlling behavior exhibited by fathers might have played a similar role for low-surgency children in the current study as it did for children with high negative affect in Belsky et al.' (1998) study. In other words, because children low on surgency in the current study were characterized by low approach to novel stimuli and minimum expressions of positive emotions during novel tasks, controlling behavior exhibited by fathers might have served as an extra "push" for these children to initiate more active exploration and draw a pleasure from it. Moreover, low surgency (or low positive emotionality) has been associated with depressive symptoms or cognitive styles indicative of depression in early childhood (Dougherty, Klein, Durbin, Hayden, & Olino, 2010; Hayden et al., 2006), which was also evidenced in the current study in that low surgency was associated with higher levels of internalizing problems 6 months later (although this was only a trend). Therefore, fathers' control may have played a protective role against internalizing problems for children low on surgency as well.

The second pattern of interactions that emerged in this study was that mothers' structure and fathers' autonomy support were concurrently associated with fewer internalizing problems only when children exhibited high levels of negative affectivity. The association between

mothers' structure and fewer internalizing problems is in line with the findings by Grolnick and Ryan (1989). They found that parents' structure was associated with children's better understanding of what controls their success and failure. They suggested that this finding was partly because parental structure may have protected children from developing a sense of helplessness. In a similar vein, mothers' clear and consistent guidance in the current study may have helped children with high levels of negative affectivity to better regulate their negative emotions, and thus they developed fewer internalizing problems. Similarly, the interaction between fathers' autonomy support and negative affectivity is also consistent with the finding of previous studies that have found heightened vulnerabilities of children with high negative affectivity in the face of high control (Belsky et al., 1998; Karreman et al., 2010; Morris et al., 2002). In the current study, children high on negative affectivity may have benefited from fathers' autonomy supportive behavior that did not elicit negative reactivity, as high levels of parental control have been shown to do, but instead demonstrated respect for the children's individual feelings and actions.

The third pattern of interactions emerged when children exhibited low levels of negative affectivity, i.e., Mothers' control and mothers' and fathers' structure appeared to have negative impacts on behavioral adjustment of these children. This pattern of interaction was somewhat puzzling. However, when the composite variable of negative affectivity was decomposed, and the individual temperament variables that comprised negative affectivity (i.e., fear, sadness, anger, involvement, compliance) were examined separately, these findings made a bit more sense. Recall that the follow-up analyses suggested that the positive association between parental control and structure and externalizing problems was primarily driven by children who scored high on involvement and compliance, which are both key characteristics of effortful control (e.g.,

Kochanska, Murray, Jacques, Koenig, & Vandegest, 1996). Therefore, parental control and structure might have actually interfered with the behavior of these children who are high on effortful control, perhaps by providing more structure and control than they actually needed, resulting in greater behavioral problems.

### *Limitations and Future Directions*

The current investigation contributes to the socialization literature by examining both mothers' and fathers' autonomy support, control, and structure during dinnertime, their links to child adjustment, and a moderating role of child temperament. However, the present study has some limitations that can be addressed in future research. First, the current sample was relatively homogeneous: It consisted of predominantly European American, middle-class families. Past research has demonstrated that families of lower socioeconomic status tend to use more controlling and punitive techniques to regulate their children's behavior (e.g., Hart & Risley, 1995; Hoff-Ginsberg & Tardif, 1995; Kelley, Sanchez-Hucies, & Walker, 1993) than more highly educated and affluent families.. Moreover, growing research on parenting behavior across diverse ethnic groups indicate that African American and Hispanic parents tend to be more controlling than European American counterparts (e.g., Dornbusch et al., 1987). However, as Bronfenbrenner (1979) proposed decades ago, cultures play an important role in determining how parenting impacts children's adjustment (e.g., Chao, 1994; Wang, Wiley, & Chiu, 2008; Wang, Wiley, & Zhou 2007). In addition, compared to European American families, African American families tend to be more egalitarian (see Taylor, Chatters, Tucker, & Lewis, 1990 for a review), while Hispanic families are traditionally more patriarchal (see Vazquez-Nuttall, Romero-Garcia, & De Leon, 1987; Vega, 1990 for reviews). Therefore, different gender roles and family structures associated with ethnicity may also influence how parent socialization is

practiced in the family and how it affects children's functioning. Future research should investigate mothers' and fathers' socialization practices with more economically and ethnically diverse samples and explore how their roles may differ across socioeconomic and ethnic groups in guiding children's development.

Another limitation of the current study is a small sample size, making it difficult to perform more comprehensive statistical analyses (e.g., structural equation modeling) to more fully investigate how different dimensions of parenting and children's temperamental characteristics make relative contributions to predicting child adjustment. In addition, some statistical analyses that did not reach significance in the current study might have been significant with a larger sample, thus providing more insight into how mothers' and fathers' socialization practices similarly or differentially impact child outcomes. It is also important to note that analyses predicting children's adjustment at the 6-month follow-up were based on incomplete data. Future analyses of the complete sample will allow us to more clearly understand how parenting and temperament at age 5 independently and jointly explain child adjustment 6 months later.

### *Implications*

The current study also provides valuable implications for practice. Although other studies have demonstrated main effects of parent socialization practices on children's functioning in academic, behavioral, and emotional domains (e.g., Baumrind, 1967, 1971, 1989; Clark & Ladd, 2000; Frodi et al., 1985; Roth et al., 2009), the current study did not find strong main effects of parenting. Instead, the current study provided additional support for the goodness-of-fit model, suggesting that the interaction between parenting and child temperament is the key determinant of child adjustment (e.g., Crockenberg & Leerkes, 2003; Maccoby, 1992; Thomas & Chess,

1977). For example, although self-determination theory suggests a universal benefit of structure for children's adjustment, the current study found that structure seemed to be less helpful for children low on negative affectivity. Temperament also appeared to have somewhat different moderating effects depending on mothers' and fathers' parenting. Specifically, in the current study, mothers' and fathers' controlling behavior had a different impact on children depending on the child's level of surgency. As Belsky et al. (1998) and MacDonald and Parke (1984) demonstrated, the same behavior by mothers and fathers may predict different child outcomes. In a similar vein, it is also possible that different parenting behaviors by mothers and fathers may predict the same child outcome. Bohanek et al. (2009), for example, found that the different ways in which mothers and fathers participated in narratives during dinnertime were related to the same child outcomes.

Some caution is needed when generalizing the findings of the current study because they may be specifically tied to the context of parent socialization practices examined in this study (i.e., dinnertime). For example, there may have been fewer opportunities for parents to exhibit autonomy support during dinnertime, compared to other contexts such as academically relevant activities that may elicit more diverse verbal and nonverbal responses from parents (e.g., Grolnick et al., 2002). In addition, as discussed in the introduction, most of the research that examined parental socialization using the framework of self-determination theory have largely focused on children in middle childhood and adolescence (e.g., Bean et al., 2003, 2006; Gerber et al., 1997). Therefore, some of the findings in the current study that appear inconsistent with the findings of past research (e.g., the positive association between structure and adjustment problem) may be unique to the age or developmental stage of the children studied in the current investigation. Indeed, parental structure was only associated with more externalizing problems

for children who had already experienced the transition to kindergarten. More research is clearly needed to replicate these findings with young children across time and contexts. Nevertheless, it is still important for families, researchers, and those who work directly with families, to be aware of the potential influence of children's age and developmental stage and socialization contexts when interpreting findings about how certain socialization practices affect child adjustment.

In conclusion, this study sheds light on mothers' and fathers' socialization practices and their associations with children's socioemotional adjustment at 5 years of age and 6 months later. Specifically, the current study made contributions to the socialization literature in three different ways: by examining fathers' roles as socialization agents, by exploring child temperament as a moderator of parenting, and by exploring parent socialization practices during dinnertime. As family systems theory suggests (e.g., Cox & Paley, 1997), research that focuses exclusively on mothers, main effects of parenting on child adjustment, and dyadic parent-child relationships can never give us a complete picture of how parent socialization works in the family. Future research must further explore mothers' and fathers' socialization practices across different phases of family development as well as across interactional contexts in the family to help further illuminate the complexity of parent socialization practices within the family system.

Tables

Table 1. Means and Standard Deviations for All the Continuous Variables

		Means	Standard Deviations
<i>Parenting</i>			
Autonomy support	Mothers	2.49	1.07
	Fathers	2.24	.86
Control	Mothers	1.58	.58
	Fathers	1.47	.65
Structure	Mothers	4.36	1.36
	Fathers	3.71	1.34
<i>Temperament</i>			
Surgency		9.48	1.99
Negative Affectivity		-4.09	1.11
<i>Child Adjustment at 5 years</i>			
Internalizing Problems		48.96	10.18
Externalizing Problems		48.24	10.36
<i>Child Adjustment at 5.5 years</i>			
Internalizing Problems		46.12	10.44
Externalizing Problems		46.09	9.93

Table 2. Correlations between All the Continuous Variables and Demographic Characteristics

	Age		Education		Income	Number of siblings	Duration of dinnertime
	Mothers	Fathers	Mothers	Fathers			
Autonomy Support – Mothers	-.12	-.16	.08	.13	-.02	-.28*	-.15
Autonomy Support – Fathers	.08	-.02	.32*	.40***	.15	-.22^	.07
Control – Mothers	.05	.06	-.07	.11	-.13	-.19	.01
Control – Fathers	-.03	.02	-.22^	-.16	.01	-.06	.06
Structure – Mothers	-.13	-.21	-.01	-.11	-.10	-.30*	-.06
Structure – Fathers	-.19	-.18	.11	.10	-.12	-.28*	.05
Surgency	.04	.04	-.10	.00	.00	-.10	.07
Negative Affectivity	.01	-.15	-.02	-.31*	.05	.17	.05
Internalizing Problems at 5 Years	.15	.12	.20	-.09	-.02	-.10	-.01
Externalizing Problems at 5 Years	.03	-.04	.08	-.09	-.15	-.03	.09
Internalizing Problems at 5.5 Years	.16	.03	.02	-.23	-.28*	.00	-.08
Externalizing Problems at 5.5 Years	-.02	-.01	-.05	-.36**	-.23^	-.10	.07

Note. ^ $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$ , \*\*\* $p < .001$  (2-tailed).

Table 3. Correlations among All the Continuous Variables

	1	2	3	4	5	6	7	8	9	10	11	12
1. Autonomy Support – Mothers		.07	.03	-.22 <sup>^</sup>	.39**	.13	-.17	-.11	-.08	-.05	.02	-.05
2. Autonomy Support – Fathers			.01	.01	.04	.45***	.05	-.25*	-.14	-.05	-.32*	-.15
3. Control – Mothers				.44***	.22 <sup>^</sup>	.01	.05	.08	-.05	-.02	.06	.13
4. Control – Fathers					-.09	.23 <sup>^</sup>	.12	.14	-.03	-.01	-.10	.01
5. Structure – Mothers						.28*	.09	.03	-.05	.13	.14	.35*
6. Structure – Fathers							.11	-.05	.13	.24*	-.05	.07
7. Surgency								-.16	-.05	.08	-.23 <sup>^</sup>	.01
8. Negative Affectivity									.23 <sup>^</sup>	.15	.35*	.26 <sup>^</sup>
9. Internalizing Problems at 5 Years										.62***	.63***	.34*
10. Externalizing Problems at 5 Years											.51***	.63***
11. Internalizing Problems at 5.5 Years												.52***
12. Externalizing Problems at 5.5 Years												

Note. <sup>^</sup> $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$ , \*\*\* $p < .001$  (2-tailed).

Table 4. A Regression Model Predicting Internalizing Problems at 5 Years by Mothers' Structure and Children's Negative Affectivity

Variables	<i>B</i>	<i>SE B</i>	$\beta$	$\Delta R^2$	<i>F</i>	<i>df</i>
Step 1						
Mothers' Structure – A	-.40	.95	-.05	.00	.18	1,64
Step 1						
Negative Affectivity – B	2.17	1.13	.24 <sup>^</sup>	.06 <sup>^</sup>	1.94	2,63
Step 3						
A	-.46	.90	-.06			
B	1.60	1.13	.17			
A × B	-1.74	.80	-.26*	.07*	2.92*	3,62

Note. <sup>^</sup> $p < .10$ ; \* $p < .05$  (2-tailed).

Table 5. A Regression Model Predicting Internalizing Problems at 5 Years by Fathers' Autonomy Support and Children's Negative Affectivity

Variables	<i>B</i>	<i>SE B</i>	$\beta$	$\Delta R^2$	<i>F</i>	<i>df</i>
Step 1						
Fathers' Autonomy Support – A	-1.72	1.49	-.14	.02	1.34	1,64
Step 2						
Negative Affectivity – B	1.94	1.17	.21	.04	2.08	2,63
Step 3						
A	-1.74	1.51	-.14			
B	1.46	1.16	.16			
A × B	-2.97	1.42	-.26*	.06*	2.92*	3,62

Note. \* $p < .05$  (2-tailed).

Table 6. A Regression Model Predicting Externalizing Problems at 5 Years by Mothers' Structure and Children's Negative Affectivity

Variables	<i>B</i>	<i>SE B</i>	$\beta$	$\Delta R^2$	<i>F</i>	<i>df</i>
Step 1						
Mothers' Structure – A	.99	.96	.13	.02	1.05	1,64
Step 2						
Negative Affectivity – B	1.37	1.17	.15	.02	1.21	2,63
Step 3						
A	.95	.92	.12			
B	.68	1.16	.07			
A × B	-2.06	.82	-.31*	.09*	2.97*	3,62

Note. \* $p < .05$  (2-tailed).

Table 7. A Regression Model Predicting Externalizing Problems at 5.5 Years by Mothers' Control and Children's Surgency without Controlling for Previous Adjustment Levels

Variables	<i>B</i>	<i>SE B</i>	$\beta$	$\Delta R^2$	<i>F</i>	<i>df</i>
Step 1						
Fathers' Education	-3.21	1.17	-.36**	.13**	7.49**	1,50
Step 2						
Mothers' Control – A	2.77	2.30	.16	.03	4.50*	2,49
Step 3						
Surgency – B	.05	.62	.01	.00	2.94*	3,48
Step 4						
A	2.72	2.23	.16			
B	-.14	.59	-.03			
A × B	2.49	1.07	.30*	.09*	3.77*	4,47

Note. \* $p < .05$ ; \*\* $p < .01$  (2-tailed).

Table 8. A Regression Model Predicting Internalizing Problems at 5.5 Years by Fathers' Control and Children's Surgency without Controlling for Previous Adjustment Levels

Variables	<i>B</i>	<i>SE B</i>	$\beta$	$\Delta R^2$	<i>F</i>	<i>df</i>
Step 1						
Family Income	-1.00	.48	-.28*	.08*	4.27*	1,50
Step 2						
Fathers' Control – A	-1.47	2.23	-.09	.01	2.33	2,49
Step 3						
Surgency – B	-1.07	.66	-.22	.05	2.50 <sup>^</sup>	3,48
Step 4						
A	-4.96	2.30	-.30*			
B	-.38	.63	-.08			
A × B	5.65	1.68	.50**	.17**	5.11**	4,47

Note. \* $p < .05$ ; \*\* $p < .01$  (2-tailed).

Table 9. A Regression Model Predicting Externalizing Problems at 5.5 Years by Mothers' Control and Children's Negative Affectivity without Controlling for Previous Adjustment Levels

Variables	<i>B</i>	<i>SE B</i>	$\beta$	$\Delta R^2$	<i>F</i>	<i>df</i>
Step 1						
Fathers' Education	-3.21	1.17	-.36**	.13**	7.49**	1,50
Step 2						
Mothers' Control – A	2.77	2.30	.16	.03	4.50*	2,49
Step 3						
Negative Affectivity – B	1.86	1.28	.19	.04	3.78*	3,48
Step 4						
A	2.44	2.18	.14			
B	1.53	1.23	.16			
A × B	-6.18	2.62	-.30*	.09*	4.49**	4,47

Note. \* $p < .05$ ; \*\* $p < .01$  (2-tailed).

Table 10. A Regression Model Predicting Externalizing Problems at 5.5 Years by Fathers' Structure and Children's Negative Affectivity without Controlling for Previous Adjustment Levels

Variables	<i>B</i>	<i>SE B</i>	$\beta$	$\Delta R^2$	<i>F</i>	<i>df</i>
<b>Step 1</b>						
Fathers' Education	-3.21	1.17	-.36**	.13**	7.49**	1,50
<b>Step 2</b>						
Fathers' Structure – A	.64	.99	.09	.01	3.90*	2,49
<b>Step 3</b>						
Negative Affectivity – B	2.19	1.31	.23	.05	3.63*	3,48
<b>Step 4</b>						
A	1.03	.96	.14			
B	1.45	1.31	.15			
A × B	-2.19	1.02	-.28*	.07*	4.07**	4,47

Note. \* $p < .05$ ; \*\* $p < .01$  (2-tailed).

Table 11. A Regression Model Predicting Externalizing Problems at 5.5 Years by Mothers' Control and Children's Surgency After Controlling for Previous Adjustment Levels

Variables	<i>B</i>	<i>SE B</i>	$\beta$	$\Delta R^2$	<i>F</i>	<i>df</i>
Step 1						
Fathers' Education	-2.44	.94	-.28*			
Externalizing Problems at 5 Years	.55	.10	.59***	.47***	21.60***	2,49
Step 2						
Mothers' Control – A	1.83	1.84	.11	.01	14.73***	3,48
Step 3						
Surgency – B	-.10	.49	-.02	.00	10.84***	4,47
Step 4						
A	1.87	1.78	.11			
B	-.24	.47	-.05			
A × B	1.90	.86	.23*	.05*	10.36***	5,46

Note. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$  (2-tailed).

Table 12. A Regression Model Predicting Internalizing Problems at 5.5 Years by Fathers' Control and Children's Surgency After Controlling for Previous Adjustment Levels

Variables	<i>B</i>	<i>SE B</i>	$\beta$	$\Delta R^2$	<i>F</i>	<i>df</i>
Step 1						
Family Income	-.96	.37	-.27*			
Internalizing Problems at 5 Years	.63	.10	.63***	.47***	21.93***	2,49
Step 2						
Fathers' Control – A	-1.54	1.70	-.09	.01	14.84***	3,48
Step 3						
Surgency – B	-.79	.50	-.16	.03	12.08***	4,47
Step 4						
A	-3.57	1.87	-.22^			
B	-.41	.51	-.08			
A × B	3.38	1.41	.30*	.06*	11.78***	5,46

Note. ^ $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$  (2-tailed).

Table 13. A Regression Model Predicting Externalizing Problems at 5.5 Years by Mothers' Control and Children's Negative Affectivity After Controlling for Previous Adjustment Levels

Variables	<i>B</i>	<i>SE B</i>	$\beta$	$\Delta R^2$	<i>F</i>	<i>df</i>
Step 1						
Fathers' Education	-2.44	.94	-.28*			
Externalizing Problems at 5 Years	.55	.10	.59***	.47***	21.60***	2,49
Step 2						
Mothers' Control – A	1.83	1.84	.11	.01	14.73***	3,48
Step 3						
Negative Affectivity – B	.27	1.08	.03	.00	10.85***	4,47
Step 4						
A	1.63	1.73	.09			
B	-.02	1.01	-.00			
A × B	-5.84	2.07	-.28**	.08**	11.55***	5,46

Note. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$  (2-tailed).

## Figures

Figure 1.

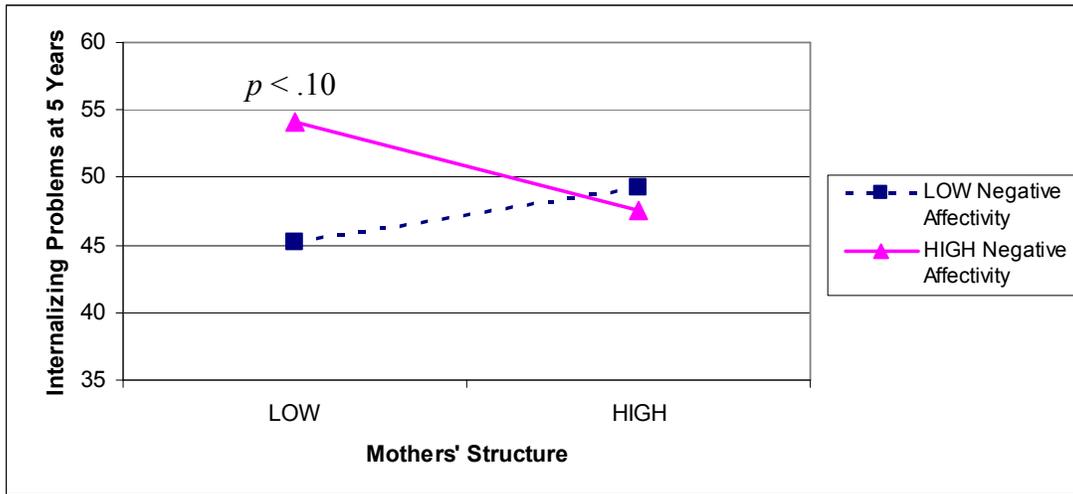


Figure 2.

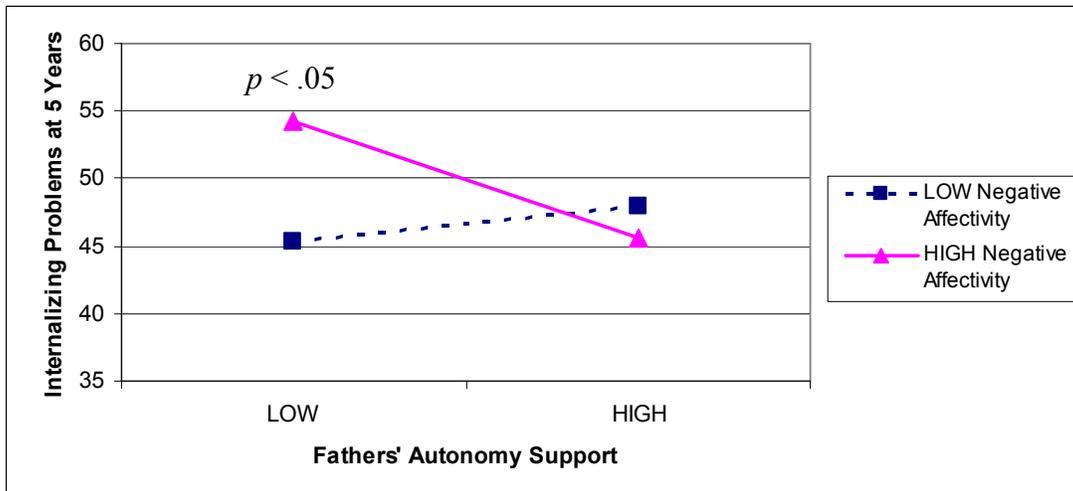


Figure 3.

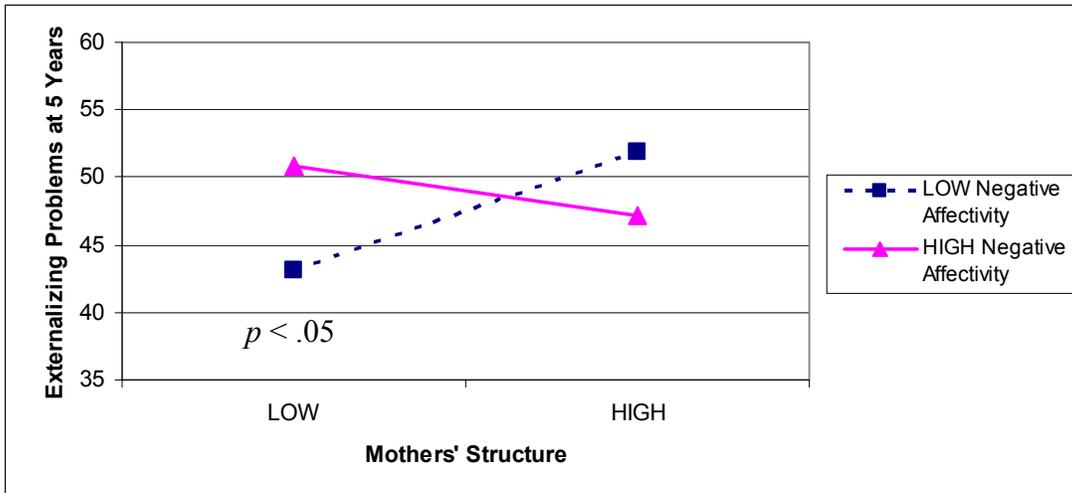


Figure 4.

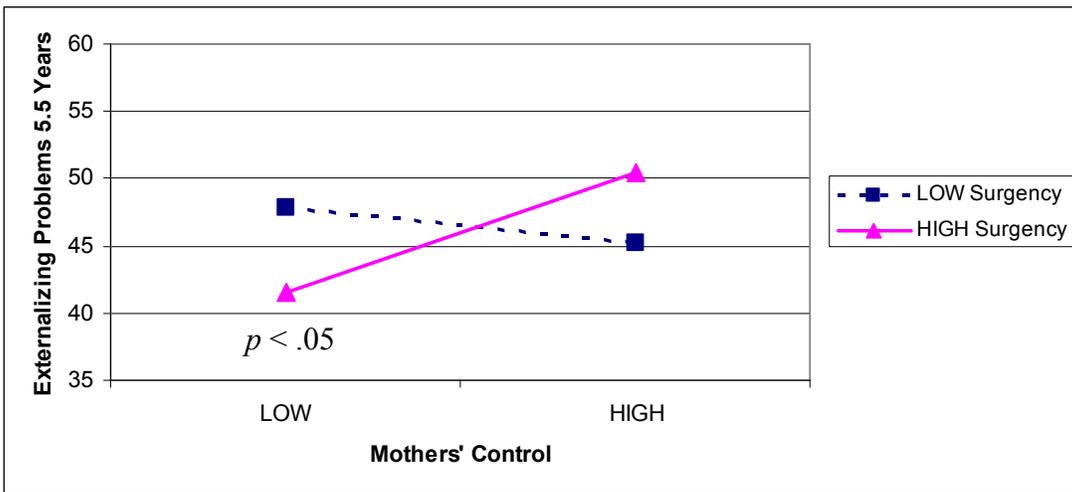


Figure 5.

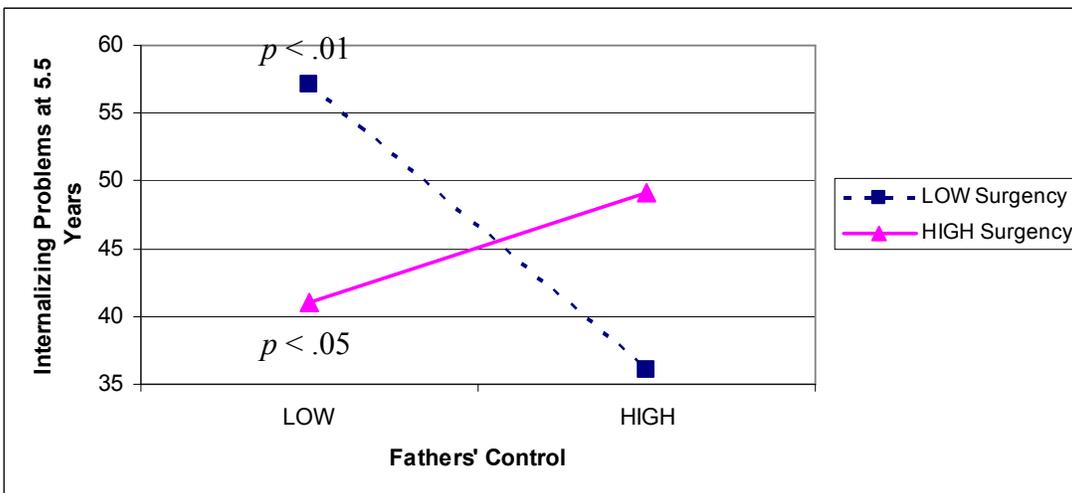


Figure 6.

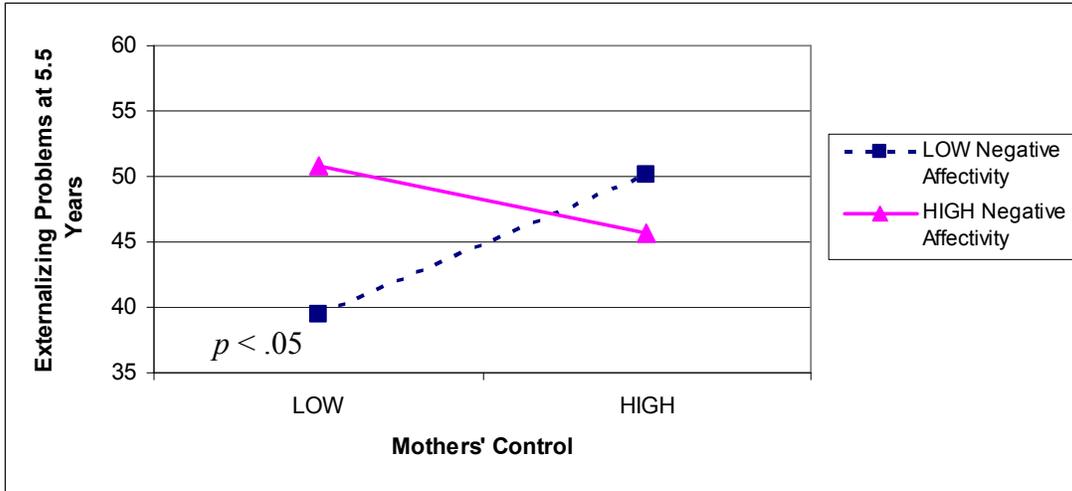


Figure 7.

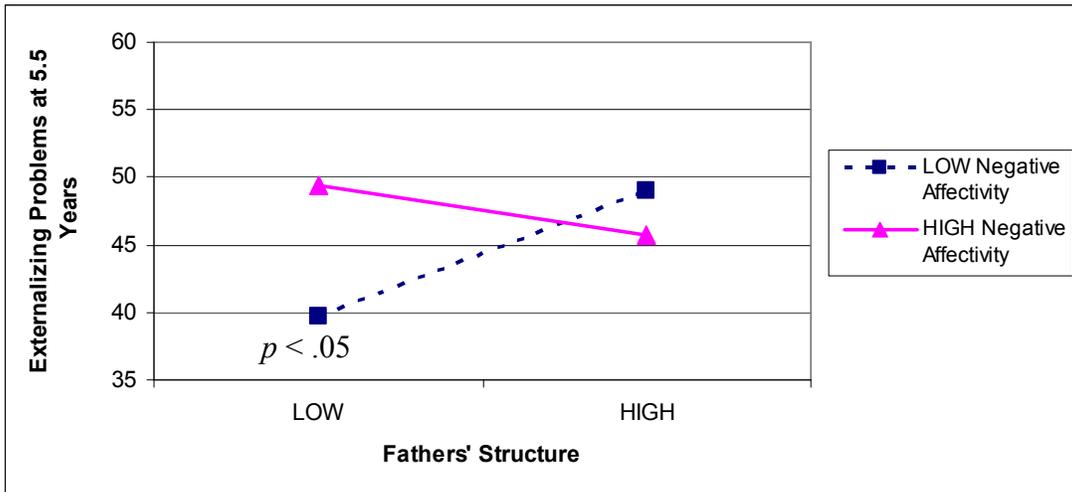


Figure 8.

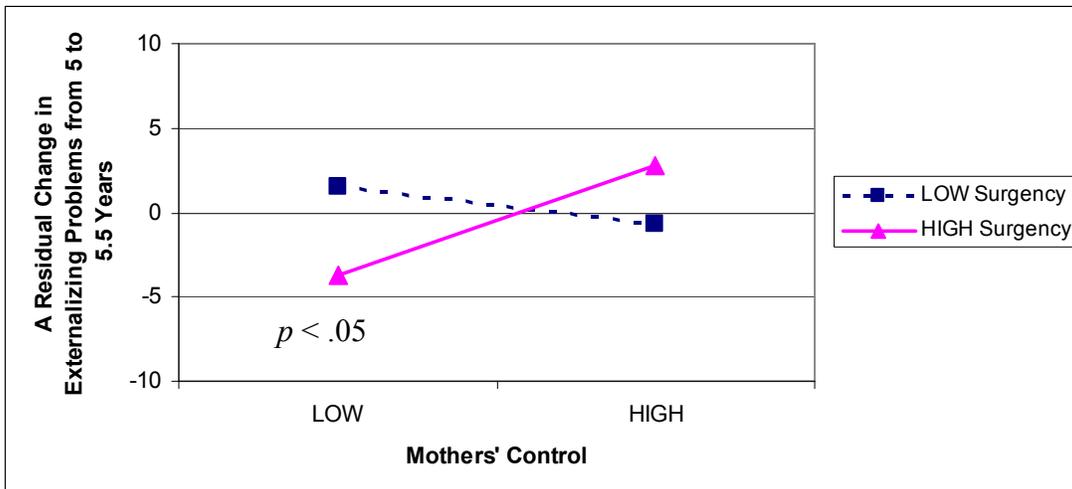


Figure 9.

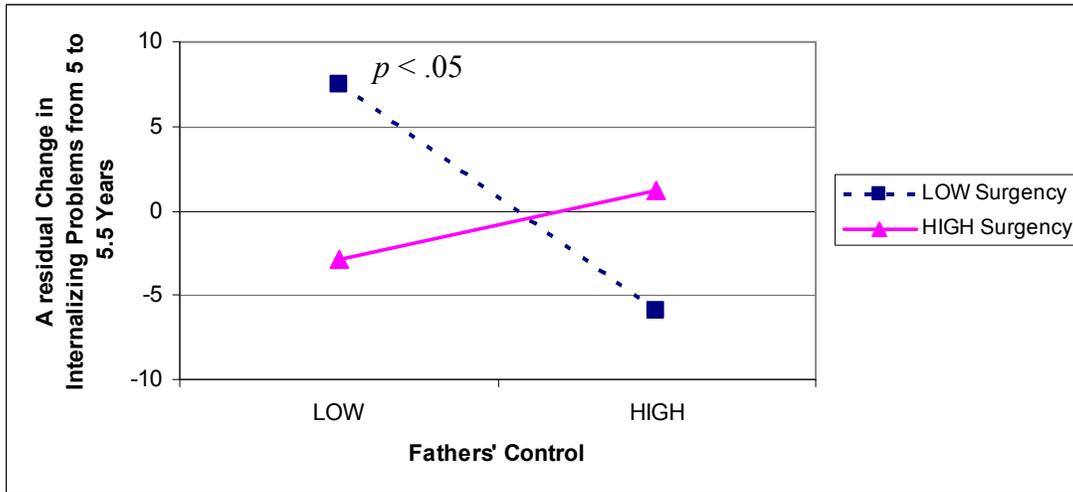
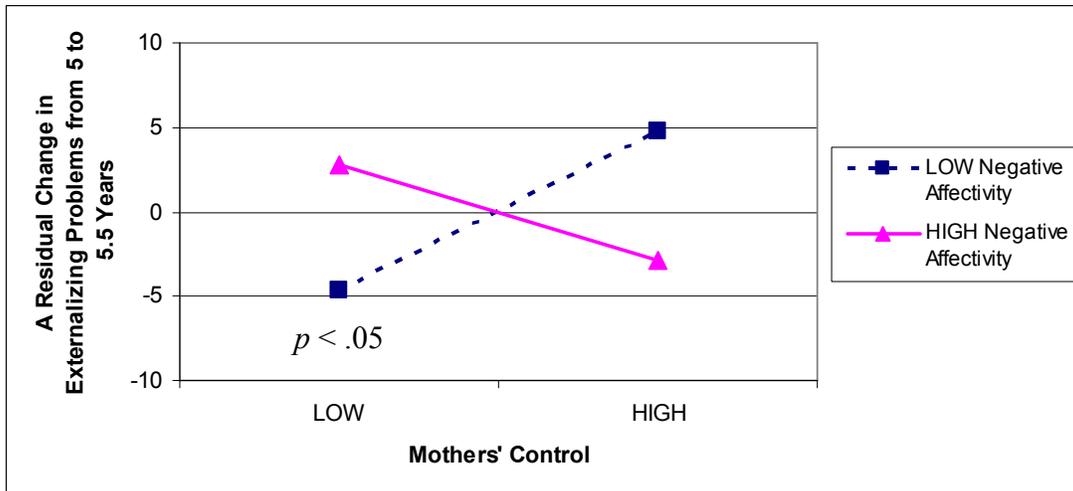


Figure 10.



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Appendix A: Demographic questionnaires

**Mother's Demographic Questionnaire**

General Questions:

Participant #: \_\_\_\_\_ Today's date: \_\_\_\_\_  
Your birthdate: \_\_\_\_\_ Child's birthdate: \_\_\_\_\_  
Your race/ethnicity: \_\_\_\_\_ Gender of child (circle): Male Female  
Marriage date (if married): \_\_\_\_\_ Birth order of child: \_\_\_\_\_  
If living with partner, what was the approximate date you moved in together? \_\_\_\_\_

Siblings Name	Birthdate	Siblings Name	Birthdate
1		4	
2		5	
3		6	

Family dinner time

How many days a week do you have dinner with all family members present? \_\_\_\_\_ day(s)  
How many days a week do you think are ideal to have dinner together as a family? \_\_\_\_\_ day(s)  
Does everybody eat the same dinner? YES NO  
If NO, whom do you prepare a different dinner for? \_\_\_\_\_ (age(s) of the child(ren))

What is the most *challenging* thing(s) about family dinner time?

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What is the most *enjoyable* thing(s) about family dinner time?

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Education:

Which best describes your current level of education?

Some High School    High School Degree    Some College    College Degree    Masters Degree    Ph.D. Degree    Other

If other, please describe: \_\_\_\_\_

If education is not yet completed:

A. Which best describes your desired level of education?

Some High School	High School Degree	Some College	College Degree	Masters Degree	Ph.D. Degree	Other
---------------------	--------------------------	-----------------	-------------------	-------------------	-----------------	-------

If other, please describe: \_\_\_\_\_

B. When do you expect to complete your educational goals? \_\_\_\_\_

Employment Status:

Are you currently working outside the home? YES NO

IF YES, please answer the questions in Section I; IF NO, please go to section II.

Section I

A. How many hours per week do you work outside the home?

0-10 hrs.    11-20 hrs.    21-30 hrs.    31-40 hrs.    41-50 hrs.    Over 50 hrs.

B. How old was your child when you returned to work? \_\_\_\_ years \_\_\_\_ months \_\_\_\_ weeks

C. How do you feel about your work outside the home?

Very Positive    Positive    Mixed    Negative    Very Negative

Could you briefly describe why you feel this way? \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

D. How does your partner feel about your work outside the home?

Very Positive    Positive    Mixed    Negative    Very Negative

Could you briefly describe why you think your spouse feels this way?

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**Section II**

**IF NO**, do you plan to return to work? YES NO UNSURE

A. How old will your child be when you plan to return to work outside the home?

\_\_\_\_\_years \_\_\_\_\_months

B. How many hours per week do you plan to work outside the home?

0-10 hrs    11-20 hrs    21-30 hrs    31-40 hrs    41-50 hrs    Over 50 hrs

C. How do you feel about (not) returning to work outside the home?

Very Positive    Mixed    Negative    Very  
Positive    Negative

Could you briefly describe why you feel this way? \_\_\_\_\_

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D. How does your spouse feel about your plans to (not) return to work outside the home?

Very Positive    Mixed    Negative    Very  
Positive    Negative

Could you briefly describe why you think your spouse feels this way?

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**Section III**

**Financial Information:**

Please indicate which best describes your family's total annual income (circle one):

less than \$10,000	\$11,000- 20,000	\$21,000- 30,000	\$31,000- 40,000	\$41,000- 50,000	\$51,000- 60,000
\$61,000 70,000	\$71,000 80,000	\$81,000 90,000	\$91,000 100,000	over \$100,000	

Is your partner currently employed? YES NO

How do you feel about your partner's current employment status?

Very Positive                  Positive                  Mixed                  Negative                  Very Negative

Could you briefly describe why you feel this way? \_\_\_\_\_

\_\_\_\_\_

Childcare:

Is your child currently attending preschool, kindergarten, or other child care arrangements on a regular basis? Please circle one.

- a. Preschool
- b. Kindergarten
- c. Other regular childcare arrangements
- d. Combinations of a/b and c
- f. not applicable

**A.** If your child currently attends PRESCHOOL/KINDERGARTEN:

- At what age did your child start attending school? \_\_\_\_\_ years \_\_\_\_\_ months
- How many days per week does your child attend school? \_\_\_\_\_ days
- How many hours per day (on average if it varies daily)? \_\_\_\_\_ hours
- How many children are in your child's class? \_\_\_\_\_
- How many teachers are in your child's class? \_\_\_\_\_

How old will your child be when starting kindergarten? \_\_\_\_\_ years \_\_\_\_\_ months

If your child also has other childcare arrangements, please go to **B** and answer the questions.

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**B.** If your child currently has OTHER REGULAR CHILDCARE ARRANGEMENTS:  
**(Please check all that apply)**

- \_\_\_ At home with relative                  \_\_\_\_\_ days per week          \_\_\_\_\_ hrs per week  
    What relation? \_\_\_\_\_
- \_\_\_ At home with sitter/nanny                  \_\_\_\_\_ days per week          \_\_\_\_\_ hrs per week
- \_\_\_ Home-based child care center                  \_\_\_\_\_ days per week          \_\_\_\_\_ hrs per week
- \_\_\_ Commercial child care center                  \_\_\_\_\_ days per week          \_\_\_\_\_ hrs per week
- \_\_\_ Government/community child care center                  \_\_\_\_\_ days per week          \_\_\_\_\_ hrs per week
- \_\_\_ University child care center                  \_\_\_\_\_ days per week          \_\_\_\_\_ hrs per week
- \_\_\_ Other                  \_\_\_\_\_ days per week          \_\_\_\_\_ hrs per week

Please describe: \_\_\_\_\_

- At what age did your child enroll in the childcare used most often? \_\_\_\_\_ years \_\_\_\_\_ months
- How many children are present in the childcare used most often? \_\_\_\_\_
- How many teachers or caregivers are present in the childcare used most often? \_\_\_\_\_

## Father's Demographic Questionnaire

### General Questions:

Participant #: \_\_\_\_\_

Today's date: \_\_\_\_\_

Your birthdate: \_\_\_\_\_

Your race/ethnicity: \_\_\_\_\_

### Family dinner time

How many days a week do you have dinner with all family members present? \_\_\_\_\_ days

How many days a week do you think are ideal to have dinner together as a family? \_\_\_\_\_ days

Does everybody eat the same dinner? YES NO

If NO, whom do you prepare a different dinner for? \_\_\_\_\_ (age(s) of the child(ren))

What is the most *challenging* thing(s) about family dinner time?

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What is the most *enjoyable* thing(s) about family dinner time?

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### Education:

Which best describes your current level of education?

|                     |                          |                 |                   |                   |                 |       |
|---------------------|--------------------------|-----------------|-------------------|-------------------|-----------------|-------|
| Some High<br>School | High<br>School<br>Degree | Some<br>College | College<br>Degree | Masters<br>Degree | Ph.D.<br>Degree | Other |
|---------------------|--------------------------|-----------------|-------------------|-------------------|-----------------|-------|

If other, please describe: \_\_\_\_\_

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If education is not yet completed:

A. Which best describes your desired level of education?

|                     |                          |                 |                   |                   |                 |       |
|---------------------|--------------------------|-----------------|-------------------|-------------------|-----------------|-------|
| Some High<br>School | High<br>School<br>Degree | Some<br>College | College<br>Degree | Masters<br>Degree | Ph.D.<br>Degree | Other |
|---------------------|--------------------------|-----------------|-------------------|-------------------|-----------------|-------|

If other, please describe: \_\_\_\_\_  
\_\_\_\_\_

B. When do you expect to complete your educational goals? \_\_\_\_\_

Employment Status:

Are you currently working outside the home? YES NO

IF YES, please answer the questions in Section I; IF NO, please go to section II.

Section I

A. How many hours per week do you work outside the home?

0-10 hrs.    11-20 hrs.    21-30 hrs.    31-40 hrs.    41-50 hrs.    Over 50 hrs.

B. How do you feel about your work outside the home?

Very Positive    Positive    Mixed    Negative    Very Negative

Could you briefly describe why you feel this way? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

C. How does your partner feel about your work outside the home?

Very Positive    Positive    Mixed    Negative    Very Negative

Could you briefly describe why you think your spouse feels this way?  
\_\_\_\_\_  
\_\_\_\_\_

Section II

IF NO, do you plan to return to work? YES NO UNSURE

A. How old will your child be when you plan to return to work outside the home?

\_\_\_\_\_ years \_\_\_\_\_ months

B. How many hours per week do you plan to work outside the home?

0-10 hrs      11-20 hrs      21-30 hrs      31-40 hrs      41-50 hrs      Over 50 hrs

C. How do you feel about (not) returning to work outside the home?

Very Positive      Positive      Mixed      Negative      Very Negative

Could you briefly describe why you feel this way? \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

F. How does your spouse feel about your plans to (not) return to work outside the home?

Very Positive      Positive      Mixed      Negative      Very Negative

Could you briefly describe why you think your spouse feels this way? \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

Section III

Financial Information:

Please indicate which best describes your family's total annual income (circle one):

|                        |                      |                     |                     |                     |                     |
|------------------------|----------------------|---------------------|---------------------|---------------------|---------------------|
| less than<br>\$10, 000 | \$11,000-<br>20, 000 | \$21,000-<br>30,000 | \$31,000-<br>40,000 | \$41,000-<br>50,000 | \$51,000-<br>60,000 |
| \$61,000<br>70,000     | \$71,000<br>80,000   | \$81,000<br>90,000  | \$91,000<br>100,000 | over \$100,000      |                     |

Is your partner currently employed?    YES    NO

How do you feel about your partner's current employment status?

Very Positive      Positive      Mixed      Negative      Very Negative

Could you briefly describe why you feel this way? \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

## Appendix B: Coding manual for the Lab-TAB

### **Pop-Up Snakes**

#### **Affect Ratings (0 = little, 1 = some, 2 = moderate to high, 3 = very high)**

Positive Affect

Fear

Sadness

Anger

#### **1. Interest**

*Normative considerations: take into account the degree of interest the child exhibits in the box and snake.*

- 0 = little interest – child is mostly uninterested in the snake
- 1 = some interest – child seems interested in the box and snake (may ask questions or make comments)
- 2 = high interest – child is quite interested in the box and snake (examines them thoroughly), or child is quite interested; may look into the box or ask many questions about the snake
- 3 = very high interest – child asks many questions about the box or snake, and is very interested and engaged; child may ask to touch the snake or look in the box repeatedly

#### **2. Activity level/energy**

*Normative considerations: This episode does not pull for a high degree of activity. Take into account the amount and vigor with which the child looks at the snakes, as well as any other movement that occurs during the episode.*

- 0 = little activity – child does not move around much during the episode
- 1 = some activity – child exhibits some energy in looking into the box or touching the snake, but does not move much during the episode
- 2 = moderate to high activity – child moves around (even if remaining seated) and/or fidgets a lot
- 3 = very high activity – child consistently demonstrates a high degree of energy in both movements and manipulations; may appear hyperactive

#### **3. Anticipatory PA**

*Normative considerations: Instances of anticipatory PA may also occur when the child is waiting to see or touch the snake. Only consider instances in which the PA is likely a result of anticipating a future event, and not when it is enjoyment of the present event. Consider verbal, as well as physical, anticipatory PA.*

- 0 = child never exhibits anticipatory PA
- 1 = child exhibits mild anticipatory PA (i.e., slight smiles or laughter when waiting to see the snake), but no physical manifestations
- 2 = child exhibits moderate anticipatory PA (i.e., large smiles or laughter when waiting to see the snake), some physical manifestations (i.e., slight wiggling or fidgeting in seat)
- 3 = child exhibits high anticipatory PA (i.e., major physical manifestations of wiggling, fidgeting, or hopping, or verbal anticipatory PA)

#### 4. Involvement vs. Passivity

*Normative considerations: consider any suggestions or demands the child directs toward the experimenter as evidence of initiative (including requests to open the box again).*

- 0 = child is consistently passive and uninvolved – does not participate in the activity or make any suggestions or demand of the experimenter; allows the experimenter to direct the episode; may require prompting from the experimenter to participate
- 1 = child is somewhat passive, may exhibit initiative on a few occasions; low levels of involvement or participation
- 2 = child shows a moderate amount of involvement – participates in the activity, but may lose interest or become distracted at certain points during the activity
- 3 = child exhibits a high degree of involvement – child does not require prompting to become involved

#### 5. Compliance

*Normative considerations: consider the child's reaction to the experimenter's suggestions or commands.*

- 0 = child is extremely noncompliant – child is argumentative or oppositional; child refuses (or fails) to comply with some of the experimenter's instructions
- 1 = somewhat noncompliant – child may fail to comply (or delay in complying) with a few of the experimenter's instructions; child protests some commands or suggestions
- 2 = moderately compliant – child complies with most of the experimenter's instructions, but may be slow to comply with or protest a few
- 3 = extremely compliant – child complies with all of the experimenter's instructions and suggestions with no delay

#### 6. Sociability

*Normative considerations: rate the degree to which the child involves the mother and experimenter in the episode, but weigh behavior with respect to the experimenter more heavily than that with respect to the mother.*

- 0 = low sociability – child does not make conversation with the experimenter; lack of eye contact and social interaction
- 1 = some sociability – child make eye contact with experimenter, and makes nonverbal responses to questions or comments
- 2 = moderate to high sociability – child makes some comments to the experimenter
- 3 = very high sociability – child makes many comments to the experimenter, actively engages in social interactions

### **Attractive toy in a transparent Box**

**Affect Ratings (0 = little, 1 = some, 2 = moderate to high, 3 = very high)**

Positive Affect

Fear

Sadness

Anger

## 1. Interest

*Normative considerations: take into account the child's interest in the keys and lock, as well as in the toy. Persistence is also a reflection of interest, such that children who work longer to unlock the box should be rated as exhibiting higher interest. Also consider the degree of interest the child exhibits in opening the lock with the experimenter and playing with the toy.*

- 0 = child exhibits little to no interest – does not spend much time working to unlock the box; may seem not to care about getting the toy (or interest fades quickly); child does not exhibit much interest in the toy once the box is unlocked
- 1 = some interest – child does attempt to unlock the box, although persistence is low; child may show interest in the toy once the box is unlocked, or show interest in the keys
- 2 = moderate interest – child shows some persistence in working on the lock, and is interested in getting the toy; child is interested in unlocking the box with the experimenter and playing with the toy
- 3 = high interest – child puts a large amount of effort into unlocking the box, and exhibits a high degree of persistence; child exhibits a high degree of interest in playing with the toy after the box is unlocked

## 2. Activity level/energy/vigor

*Normative considerations: This episode does not pull for a high degree of activity. Pay attention to the manner in which the child manipulates the keys and box, as well as the toy. Also note any other movement the child makes during the episode.*

- 0 = extremely low energy – child remains in one place for most of the episode; manipulation of the keys and box is sluggish, or child does not manipulate the stimuli
- 1 = low to moderate energy – child remains in one place for most of the episode; manipulation of the keys, box, and toy is not particularly vigorous
- 2 = moderate to high energy – child is particularly vigorous in manipulations of keys, lock, and box; child moves about the room during the episode
- 3 = extremely high energy – child exhibits a high degree of activity (i.e., aimless wandering or running around the room, moving stimuli); child is very vigorous with the keys, box, or toy

## 3. Anticipatory PA

DO NOT RATE THIS VARIABLE.

## 4. Involvement vs. Passivity

*Normative considerations: involvement is indicated by behaviors such as the following: continually trying to open the box; manipulating both the keys and the box; making requests or demands of the experimenter or going to the door to look for the experimenter. Help-seeking, however, could also be interpreted as passivity, especially for the child who requests help without really attempting to open the lock themselves first. Passivity may also be reflected by allowing the experimenter to open the box, or waiting for the experimenter to make suggestions for play. Initiative should not be completed confounded with noncompliance or negative affect – initiative implies active contribution to ongoing interaction, and not just refusal or negativity.*

- 0 = child does not demonstrate any involvement – child passively allows experimenter to direct the episode, may wait for someone else to open the box; child does not attempt to open the box
- 1 = some involvement – child demonstrates involvement on a few occasions; may try to open the box, but loses interest

- 2 = moderate involvement – child actively tries to open the box but may lose interest or ask for help on several occasions
- 3 = high involvement – child continually tries to open the box; child remains involved in the activity for the duration

## 5. Compliance

*Normative considerations: consider compliance with both experimenter's and mother's demands and requests.*

- 0 = extremely noncompliant – child fails to comply with most demands and requests; is argumentative or oppositional
- 1 = fairly noncompliant – child fails to comply with some requests or demands; may be somewhat argumentative
- 2 = fairly compliant – child complies with most requests or demands (but may require some prompting or be slow in complying in some cases); child does not argue with the experimenter
- 3 = extremely compliant – child complies with all requests or demands made by the experimenter

## 6. Sociability

- 0 = little to no sociability – child does not interact with experimenter and makes no attempts to engage the experimenter in interaction
- 1 = some sociability – child makes some attempt to engage the experimenter in interaction
- 2 = moderate sociability – child attempts to include the experimenter in play
- 3 = high sociability – child is outgoing with the experimenter, consistently makes attempts to include her in his/her play

## Bead Sorting

**Affect Ratings (0 = little, 1 = some, 2 = moderate to high, 3 = very high)**

Positive Affect

Fear

Sadness

Anger

### 1. Interest

*Normative considerations: take into account the degree of interest the child exhibits in the boxes and beads.*

- 0 = little interest – child is mostly uninterested in the beads
- 1 = some interest – child seems interested in the boxes and beads (may ask questions or make comments)
- 2 = high interest – child is quite interested in the boxes and beads (examines them thoroughly), or child is quite interested; may ask questions about the task
- 3 = very high interest – child asks many questions about the boxes or beads, and is very interested and engaged in the task

## 2. Activity level/energy

*Normative considerations: This episode does not pull for a high degree of activity. Take into account the amount and vigor with which the child manipulates the beads, as well as any other movement that occurs during the episode.*

- 0 = little activity – child does not move around much during the episode
- 1 = some activity – child exhibits some energy in manipulating the beads, but does not move much during the episode
- 2 = moderate to high activity – child moves around (even if remaining seated) and/or fidgets a lot
- 3 = very high activity – child consistently demonstrates a high degree of energy in both movements and manipulations; may appear hyperactive

## 3. Anticipatory PA

DO NOT RATE THIS VARIABLE.

## 4. Involvement vs. Passivity

*Normative considerations: consider any suggestions or demands the child directs toward the experimenter as evidence of involvement (including requests to open the box again).*

- 0 = child is consistently passive – does not sort the beads or become involved in the activity at all
- 1 = child is somewhat passive – may exhibit involvement on a few occasions; may sort some beads but quickly becomes distracted or stops the task
- 2 = child shows a moderate amount of involvement – sort some beads, but child may become distracted; seems involved in the task, but may look away or sort incorrectly to be finished sooner
- 3 = child exhibits a high degree of involvement – child remains involved in the activity for the duration

## 5. Compliance

*Normative considerations: consider the child's reaction to the experimenter's suggestions or commands.*

- 0 = child is extremely noncompliant – child is argumentative or oppositional; child refuses (or fails) to comply with some of the experimenter's instructions
- 1 = somewhat noncompliant – child may fail to comply (or delay in complying) with a few of the experimenter's instructions; child protests some commands or suggestions
- 2 = moderately compliant – child complies with most of the experimenter's instructions, but may be slow to comply with or protest a few
- 3 = extremely compliant – child complies with all of the experimenter's instructions and suggestions with no delay

## 6. Sociability

*Normative considerations: rate the degree to which the child involves the mother and experimenter in the episode, but weigh behavior with respect to the experimenter more heavily than that with respect to the mother.*

- 0 = low sociability – child does not make conversation with the experimenter; lack of eye contact and social interaction
- 1 = some sociability – child make eye contact with experimenter, and makes nonverbal responses to questions or comments

- 2 = moderate to high sociability – child makes some comments to the experimenter
- 3 = very high sociability – child makes many comments to the experimenter, actively engages in social interactions

## **Snack Delay**

### **Affect Ratings (0 = little, 1 = some, 2 = moderate to high, 3 = very high)**

Positive Affect

Fear

Sadness

Anger

#### **1. Interest**

*Normative considerations: rate the child's engagement in the entire task, including evidence such as prompting, gazing at the bell, cup, or experimenter in anticipation (anticipatory behavior), and helping to pick out M&M's or place them on the cup, treating the task as a whole as a game. Also consider interest in and exploration of the stimuli themselves (i.e., M&M's, bell).*

- 0 = little interest – child may have a passing interest in the M&M's or the bell, but is not engaged in the task for most of the episode; does not seem interested in when the experimenter is going to ring the bell
- 1 = some interest – child is interested in the stimuli or in the task for a significant part of the episode, but either fails to prompt the experimenter or to engage in much anticipatory behavior while waiting for the experimenter to ring the bell. May be interested in bell or M&Ms but not in the game
- 2 = moderate to high interest – child is quite interested in the stimuli and is interested in the task for a majority of the episode; child anticipates the bell ringing, and may prompt the experimenter; child may help the experimenter place M&M's on the plate
- 3 = very high interest – child is very interested in the stimuli and the task throughout the entire episode; child either prompts the experimenter strongly or anticipates the bell ringing eagerly; child responds quickly and enthusiastically when the bell is rung

#### **2. Activity level/energy/vigor**

*Normative considerations: this episode does not elicit a great deal of activity. Vigor may be evident in the child's manipulation of the bell, physical prompts, posture, and any other movement (including fidgeting).*

- 0 = little energy – child's posture is typically slumped; movements and gestures consistently lack energy; child does not move
- 1 = some energy – child's posture is not slumped or droopy, but child does not move much; movements and gestures are not particularly vigorous
- 2 = moderate to high energy – child's movements and gestures reflect energy and vigor; child may move somewhat
- 3 = very high energy – child's movements are consistently energetic or vigorous; may seem overactive or hyper

### 3. Anticipatory PA

*Normative considerations: anticipatory PA may be evident during the periods when the child is waiting for the experimenter to ring the bell, or when the child first walks in the room and sees the M&M's.*

- 0 = no anticipatory PA
- 1 = some anticipatory PA – child occasionally smiles while waiting for the experimenter to ring the bell
- 2 = moderate anticipatory PA – child consistently smiles while waiting for the experimenter to ring the bell
- 3 = high anticipatory PA – child displays a few instances of verbal or physical anticipatory PA, and consistently smiles while waiting for the experimenter to ring the bell

### 4. Involvement vs. Passivity

*Normative considerations: prompts to the experimenter are evidence of initiative, as are behaviors such as asking to ring the bell (or grabbing the bell), choosing M&M's, placing them on the plate, etc.*

- 0 = child is consistently passive and uninvolved – does not prompt the experimenter, does not ask to ring the bell; child may require some prompting from the experimenter
- 1 = fairly passive – child may demonstrate some initiative on a few occasions (i.e., ask to ring the bell in a nonassertive manner, weak prompting), but typically allows the experimenter to direct the episode
- 2 = some involvement – child displays clear-cut initiative on at least a few occasions; child prompts the experimenter in an emphatic fashion, asks or demands to ring the bell in an assertive manner; rarely becomes distracted
- 3 = moderate to high involvement – child remains highly involved; child does not become distracted during the activity; may attempt to direct the episode

### 5. Compliance

*Normative considerations: consider compliance with the task itself (i.e., waiting for the experimenter to ring the bell before eating the M&M, ringing the bell while in the experimenter's hand, as well as compliance with commands from the experimenter*

- 0 = extremely noncompliant – child is argumentative or oppositional; does not wait for the experimenter to ring bell on a few occasions, or consistently argues or refuses to comply with the experimenter's commands
- 1 = fairly noncompliant – child argues somewhat about the bell or other aspects of the task; may not wait for the bell on 1 occasion; child complies with most of the experimenter's commands, but is somewhat slow to comply on a few occasions
- 2 = fairly compliant – child complies with all (or almost all) of the experimenter's commands, but may be slow to comply or mildly argumentative
- 3 = extremely compliant – child always waits for the experimenter to ring the bell, does not ring the bell while in the experimenter's hands, and does not argue about the bell; child complies with all of the experimenter's suggestions and commands

## 6. Sociability

*Normative considerations: rate the degree to which the child initiates interaction with the experimenter (verbal and nonverbal).*

- 0 = low sociability – child does not initiate interaction with the experimenter, and makes only minimal responses to comments made by the experimenter; child does not make much eye contact with the experimenter
- 1 = some sociability – child makes eye contact with the experimenter, and responds to comments made by the experimenter, but typically does not initiate interaction
- 2 = moderate sociability – child directs comments or questions to the experimenter and initiates interaction
- 3 = high sociability – child consistently engages in interaction, makes many comments to the experimenter, wants to include the experimenter in the game

## Popping Bubbles

**Affect Ratings (0 = little, 1 = some, 2 = moderate to high, 3 = very high)**

Positive Affect

Fear

Sadness

Anger

### 1. Interest

*Normative considerations: consider the degree of interest the child exhibits in the stimuli themselves (bubble gun and solution), as well as in the games the experimenter suggests.*

- 0 = little interest – child exhibits minimal interest in the games the experimenter suggests; may show some interest in the bubble gun or the bubbles
- 1 = some interest – child demonstrates interest in the bubble gun and bubbles, but does not show much interest in the games the experimenter suggests
- 2 = moderate interest – child is definitely interested in the bubble gun and bubbles; may request to use the gun or offer suggestions for play; participates with enjoyment in the games the experimenter suggests
- 3 = high interest – child is very interested in the bubble gun and bubbles, and participates with enthusiasm in the games the experimenter suggests; child offers suggestions for play; consistently engaged and engrossed in the activity

### 2. Activity level/energy/vigor

- 0 = little energy – child is relatively inactive for most of the episode, does not move much around the room; movements and gestures typically lack vigor
- 1 = some energy – child moves about the room somewhat, but typically does not run or hop; demonstrates some energy in popping bubbles or manipulation of gun
- 2 = moderate to high energy – child moves about the room quite a bit; child runs or hops frequently; demonstrates energy in popping bubbles or manipulation of gun
- 3 = very high energy – child moves about the room quickly and a great deal throughout the episode; child consistently demonstrates high energy

### 3. Anticipatory PA

*Normative considerations: anticipatory PA may be evident when the child is waiting for the experimenter to blow bubbles, or when the child first walks into the room and sees the bubble gun.*

0 = DO NOT USE

1 = child never displays anticipatory PA

2 = child displays at least 1 instance of mild anticipatory PA

3 = child displays a few instances of mild anticipatory PA, or 1 (or more) instances of strong anticipatory PA (i.e., jumping up & down, verbal anticipatory PA)

### 4. Involvement vs. Passivity

*Normative considerations: involvement is reflected by the following behaviors – making suggestions for play, asking for or insisting to take the bubble gun, actively participating in popping the bubbles and using the bubble gun, while passivity is reflected by waiting for the experimenter to make suggestions or to direct the episode.*

0 = child is consistently passive – allows the experimenter to direct the episode; child does not make suggestions for play, does not attempt to pop the bubbles and does not play with the bubble gun

1 = child demonstrates a few instances of involvement – may pop some bubbles or briefly play with the bubble gun but easily becomes distracted

2 = child demonstrates moderate involvement – pops some bubbles, plays with the bubble gun, but the child may become distracted or display some passivity

3 = child demonstrates high involvement – child makes many suggestions for play; asks repeatedly and assertively to play with the gun or takes the gun from the experimenter; child may attempt to take control of the episode; remains involved in the activity for the duration

### 5. Compliance

*Normative considerations: consider the experimenter's requests to stand in a certain place, to engage in particular activities, and to wait for the bubble gun.*

0 = extremely noncompliant – child fails to comply with most of the experimenter's requests; is argumentative or oppositional

1 = fairly noncompliant – child fails to comply with some of the experimenter's requests; may repeatedly argue with the experimenter about the gun

2 = fairly compliant – child complies with most of the experimenter's requests, but may require prompting to comply or delay in complying

3 = extremely compliant – child complies with all of the experimenter's requests and suggestions with no protest or delay

### 6. Sociability

*Normative considerations: rate the degree to which the child attempts to engage the experimenter in interaction and play.*

0 = low sociability – child does not initiate interaction; makes only minimal responses to experimenter's comments, may make poor eye contact with the experimenter

1 = some sociability – child makes eye contact with the experimenter; responds (at least nonverbally) to the experimenter's comments or questions

- 2 = moderate sociability – child makes some comments to the experimenter, and reciprocates the experimenter's attempts at interaction
- 3 = high sociability – child makes many comments or questions to the experimenter; makes several attempts to include experimenter in play

## Appendix C: Coding manual for autonomy support and control

\*Incidents related to the content codes below are recorded every 10-minute interval.

### Verbal Content Codes

#### **Autonomy support**

- a) General feedback and encouragement with respect to child's autonomy - e.g. "You're doing a great job all by yourself!" (If context of praise or feedback is not clear, do not code).
- b) Solicited checking – e.g. helping the child upon his/her request, "Lets figure out where this piece goes".
- c) Request of child's opinions or suggestions about how things are to be handled – e.g. "Where would you want to put this piece?" (parent might not know the answer) (**family task**)/ "Would you like to have some of this?"
- d) Prompting or encouraging the child to tell a story – e.g. "What happened at the park today?"
- e) Continuing or expanding the child's topic – e.g. "That is really nice. But what happened to X then?"

#### **Control**

- a) Directives/leading questions - e.g. "Put this piece here."
  - b) Prohibitions – e.g. "Don't put that there." "Don't draw me like that."
  - c) Unsolicited checking – e.g. asking or criticizing the child for what he or she is doing without the child's request.
  - d) Interrupting the child in the middle of telling a story (**dinner time**)
  - e) Entirely changing the child's topic or explicitly negating the child (**dinner time**)
- Off-task and other conversation
  - No talk

- 1. Never**
- 2. Infrequently**
- 3. Sometimes**
- 4. Fairly Frequently**
- 5. Very Frequently**

### Nonverbal Content Codes

#### **Autonomy support**

- a) Nonverbal feedback – e.g. Clapping as the child completes the task.
- b) Solicited checking – e.g. assistance provided upon the child's request.

#### **Control**

- a) Taking over – e.g. doing the task for the child, correcting what the child has done or said.
  - b) Behavioral directives – e.g. behaviorally directing the child what to do and how to do it
  - c) Unsolicited checking – e.g. assistance provided in the absence of child's request.
- Other off-task behavior
  - No behavior

### Global Coding for autonomy support and control

#### **Verbal behavior**

1. Never or very little observed autonomy-support or control behavior.
3. Moderately autonomy-supportive or controlling.
5. Highly autonomy-supportive or controlling.

#### **Nonverbal Behavior Scales**

1. Never or very little observed autonomy-support or control behavior.
3. Moderately autonomy-supportive or controlling.
5. Highly autonomy-supportive or controlling.

## Appendix D: Coding manual for structure

### Structure of the child's behavior

This scale reflects how adequately the mother attempted to establish her expectations for the child's behavior versus not communicating her expectations or not enforcing her agenda adequately. Scoring mother's behavior here depends on whether the child was compliant or noncompliant to mother's attempts to set limits.

(A) If the child was noncompliant to mother's agenda, a mother high on structure would increase her efforts to set limits before the child's behavior became totally unacceptable and prompted a high magnitude response. Limit-setting which is tentative and pleading (instead of authoritative) or awkward and ineffective in style, would be cause to lower a mother's score substantially. Additionally, a mother who sets strong limits which are inconsistent and sporadic in the absence of other structuring cues would get a low score even though her occasional limit-setting was done forcefully.

(B) If the child is compliant, mother's limit-setting must be judged by her ability to structure the situation with her agenda. A mother may do so in a variety of styles and may or may not be sensitive and responsive to the child's interests. The criterion is whether she can establish structure in the session that reflects the purposes of the session and an agenda for the child's behavior. Conversely, a mother who is hesitant to establish leadership and retreats from difficulties with the child (perhaps using persuasion or distraction to get compliance in ways that suggest lack of leadership in the relationship) would get a lower score.

Thus, whether or not the child is compliant, the issue underlying this scale is whether the mother is in charge, or willing to take charge as necessary, to accomplish the tasks. Within this criterion, mothers may, by a variety of styles, accomplish her leadership (and may even decide with a very noncompliant child not to continue trying to force the child to perform some task) but the sense of mother providing structure and setting necessary limits should be present consistently during the session to get a high score.

1. Mother fails to communicate her expectations for the child except in minimal ways and show no effective leadership. Thus, mother makes very few demands on child's behavior and seems powerless to affect the child's agenda.
2. Mother exerts some leadership but without consistency. Thus, few of her efforts have much effect on the child and she reacts to the child's agenda more than she tries to communicate her agenda for the child. Her attempts to influence the child are sporadic and convey a sense of powerlessness over the child even before the child has been noncompliant to direct control efforts.

3. Mother does a fairly adequate job of establishing basic limits for the child and trying to get the child to do the tasks. Yet, she shows very little ability to make her agenda operational. She may collapse in her demands and revert to pleading with the child ("Won't you please do this?") when the child is noncompliant and generally shows great inconsistency in her approach and a lack of control techniques in this session. She readily lets the child have control and her structuring behaviors lose by failure to follow through on her expectations.

4. Mother establishes reasonable structure for the child during much of the session and seems to have some leadership in the session. She shows some ability to insist on her structuring of the situation, but her behavior shows inconsistency across tasks and at critical points when the child has begun to deviate unreasonably from her schedule.

5. Mother establishes her agenda adequately in the session and makes authoritative efforts to have the child follow it. Despite a few lapses in leadership, the mother provides adequate structure to keep her agenda before the child. If the child is noncompliant, the mother tries more vigorously to establish her expectations, but the timing or style of these efforts may be somewhat inadequate to maintain the sense of her leadership.

6. Mother establishes her agenda in the session and is authoritative and consistent in her leadership efforts. If the child is noncompliant, she more strongly reiterates her expectations, maintaining her sense of command and continuing to structure the situation instead of relinquishing control to the child. This mother has only minor instances in which she seems not to be in charge and aware of the flow of events and able to respond to the child's needs for more structure or limits. Thus, this mother seems effectively to be in control although not necessarily always exercising control.

7. This mother meets all the criteria of this scale. She establishes a structure for the session in which her goals will be accomplished, she responds consistently and authoritatively to compliance problems, and she maintains adequate leadership and discipline to be in charge of events (even if the child is noncompliant, the mother could retain leadership of the session by the way she handles this issue). The mother may be strict or gentle, intrusive or respectful of the child's autonomy, but achieves this level of structure and limit setting.

(Note: Code ineffective but persistent limit setting techniques as moderate (3,4,5), showing that limits are applied but mother not good at it. Thus, a 5 is a good score for a mother who strongly keeps her agenda before the child but without the necessary skills for effective leadership, e.g., little flexibility in techniques, poor timing in responding to deviation, but done with authority.)