The effects of SES and maternal depressive symptoms on toddlers' motivation to learn: Parental teaching as a mechanism of influence

Marie-Eve Dubois

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ABSTRACT

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Maternal depression and socioeconomic status (SES) have both been linked to a range of cognitive and socioemotional outcomes in children. This study examines parental teaching strategies (amount of task information and quality of motivational support provided) as potential mediators of the link SES and maternal depressive symptoms share with children's motivation to learn. Parent-child dyads attended two laboratory visits approximately one year apart (mean child age at wave 1=26 months; wave 2= 41 months). Cross-sectional and longitudinal mediation were examined. At W1, the amount of information and quality of motivational support provided by mothers in a learning task mediated the link between SES and children's motivation to learn. However, maternal depression had no effect on teaching or children's motivation to learn. At W2, an opposite pattern of results emerged: SES only predicted the amount of task information provided by mothers, whereas motivation support mediated the relation between maternal depression and child motivation to learn. Although no mediation was found in the longitudinal results, it was found that motivation support provided by mothers when children were 26 months predicted motivation to learn at 41 months, over and above the effects of children's motivation to learn at 26 months. This suggests a shift in the influence of SES and maternal depression on parenting and child outcomes, while emphasizing the importance of the motivation support provided by mothers in children of

young age. More extended longitudinal work is needed to determine the developmental trajectories of the link between these factors.

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Introduction

Socioeconomic status (SES) and maternal depression are two widely studied constructs. SES has been associated with a wide array of cognitive and socioemotional outcomes (Bradley & Corwyn, 2002). Indeed, lower parental SES has also been linked to internalizing and externalizing problems, academic failure, lower cognitive abilities, and, most relevant to the current study, lower motivation to learn (Bradley & Corwyn, 2002; Conger, Conger, & Elder, 1997; Huston, McLoyd, & Garcia Coil, 1997; Stipek & Ryan, 1997). Maternal depression has also been associated with lower social competence, greater rates of internalizing and externalizing disorders, as well as academic failure (Field, Grizzle, Scafidi & Schanberg, 1996; Gross, Conrad, Fogg & Willis, 1995). Because low SES tends to be related to depression, and especially so in women (Lorant et al., 2003), many researchers have tried to understand the relative importance of both SES and maternal depression in predicting different variables, such as psychiatric symptoms, adjustment, and cognitive functioning of children (Burt et al., 2005; Campbell et al., 2007). The effects of SES and maternal depression on children's development are often mediated by parenting behaviours (Conger & Donnellan, 2007). The present study is among the first to try to disentangle the effects of SES and maternal depression on toddlers' motivation to learn, a strong predictor of academic achievement and learning (Stipek & Ryan, 1997). This study was also designed to understand the mechanisms through which SES and maternal depressive symptoms might influence children's motivation to learn, by examining parental teaching as a mediator.

Eagerness to Learn

Gauvain and her colleagues (2002) hypothesize that children's eagerness to collaborate with their parents may facilitate cognitive development. Indeed, the structure provided by the parent in a learning activity improves the child's ability and willingness to participate in it (Gauvain et al, 2002). As children interact with adults who help them with challenging tasks, they eventually come to internalize the knowledge and abilities that have been demonstrated to them (Vygotsky, 1978). Consequently, children who are motivated to learn from their parents could more readily acquire the skills and knowledge transmitted by their parents compared to other children. It is therefore important to examine the different parental variables which could influence toddler's eagerness to learn from their parents.

Most of the literature on children's learning motivation has focused on the early school years and beyond. However, little is known about children's eagerness to learn from parents in toddlerhood, which could be an important predictor of later motivation to learn in school. Children's eagerness to learn from their parents is defined as children's matching of parental actions or imitative behaviours, in addition to the child's enthusiasm and receptiveness to guidance from the mother (Forman, Aksan, & Kochanska, 2004). Children's responsiveness to parents is also regarded as an important part of socialization, believed to be a result of expectations of mutual responsiveness (Forman & Kochanska, 2001). Early on, children form expectations of parents' responses and about the likelihood of their interactions with their parent being pleasurable (Maccoby & Martin, 1983). If children have good expectations of their parent's responsiveness, they

are more prone to be motivated to do what the parent has asked, and this has been argued to facilitate the acquisition of different skills and rules (Gosselin & Forman, in preparation; Kandler, Gosselin & Forman, 2008).

Mothers who are depressed or from a lower socioeconomic background are less responsive to their children (Wilfong, Saylor, & Elksnin, 1991). It is therefore possible that, in response, children will be less responsive to their mothers' socialization efforts. In addition, because the quality of the parent-child relationship may be an important contributor to the child's eagerness to learn and to imitate from the parent (Kochanska, Forman, & Coy, 1999), it can be expected that children of mothers who experience high levels of depressive symptoms may be less eager to learn from them. It is also likely that low-SES children would be less eager to learn from their mothers. Indeed, their mothers have less education and financial resources, and might be overwhelmed by the stress of making ends meet in their life. Consequently, they could have less time to devote to their relationship with their child. It is also possible that, in addition to the quality of their relationship, the way in which parents teach their children has an influence on their children's eagerness to learn from them.

Maternal Depression

Depression is one of the most prevalent mental disorders, affecting approximately 8% of mothers (Downey & Coyne, 1990) and has been found to have detrimental effects on the development of children of all ages, including in very young children (Goodman & Gotlib, 2001; Murray et al., 1996). By the time these children reach preschool age, they are more likely than children of nondepressed mothers to have lower social competence, and more internalizing and externalizing problems (Field et al,

1996; Gross, Conrad, Fogg, Willis & Garvey, 1995) These negative effects of maternal depressive symptoms on child development are related to many factors, one of which is parenting (Goodman & Gotlib, 1999). It is hypothesized that parenting could mediate the relation between maternal depression and child developmental outcomes.

Many studies have examined the parenting difficulties of depressed mothers, which are believed to be a reflection of the symptoms of their disorder. Indeed, depressed parents exhibit greater degrees of non-acknowledgement, negativity toward parenthood, rejection and hostility towards their child, and feel less competent as parents. Also, they are less psychologically available, more insensitive, inattentive, and irritable, and display lower levels of warmth (Downey & Coyne, 1990; Cox, Puckering, Pound & Mills, 1987; Goodman & Brumley, 1990; Parker, Tupling, & Brown, 1979; Kendler, Myers, & Prescott, 2000). Moreover, depressed mothers express less positive affect than nondepressed parents during their interactions with their children, and are less contingent and consistent (Downey & Coyne, 1990; for a more extensive and recent review, see Silberg & Rutter, 2001). Depressive symptoms in mothers have also been associated with less time spent in joint attention (JA: Goldsmith and Rogoff, 1997). The authors suggest that one possible reason for the shorter duration of JA is mothers' avoidance of interaction with their child, and this could be one of the mechanisms through which children of depressed mothers are put at risk for cognitive, emotional and social problems.

The parenting difficulties of depressed parents, and especially depressed mothers, as well as the outcomes for their children, have been well established (Goodman &

Gotlib, 2001). However, in recent years, research has shifted to understanding the mechanisms through which maternal depression has an effect on child development rather than providing descriptions of the effects of maternal depression on children and on parenting. A few attempts (Elgar et al., 2007; Johnson et al., 2001; Bifulco et al., 2002; Burt et al., 2005) have been made to explain the relation between maternal depression and child outcomes by testing mediation by parental behaviour of the link between depressive symptoms and child maladjustment. In a longitudinal study following 593 children from childhood into early adulthood, Johnson and his colleagues (2001) examined the mediational role of maladaptive parental behaviours (harsh punishment, inconsistent enforcement of rules, maternal possessiveness, etc.) in the relation between parental and offspring psychiatric diagnosis. Even after controlling for such factors as parental education, age, sex, and difficult temperament in childhood, parental maladaptive behaviours accounted for the association between parent psychopathology and early adulthood psychopathology in their children. Results from this study highlight the importance of parenting as a mediator of the intergenerational transfer of risk for psychopathology, in a community sample. However, no attempt was made to tease apart parental competence from psychosocial functioning.

Following from Johnson et al.'s (2001) study, Bifulco et al. (2002) conducted a study designed to differentiate the influences of maternal depression from poor psychosocial functioning and poor parenting on offspring psychiatric disorders. They found that the relation between chronic/recurrent maternal depression and offspring psychiatric disorder was entirely mediated by parents' neglect/abuse of their offspring. Psychosocial vulnerability of the mother predicted psychiatric disorder in the offspring

and this association was partly mediated by neglect and abuse. Results from these studies provide evidence for parental behaviours as mediators of the association between maternal depression and child outcomes. The results suggest the possibility that helping parents improve their parenting skills and behaviours would have positive effects on child development. This is important as it has been found that treatment aimed at relieving the symptoms of postpartum depression but without parenting support was not sufficient in improving the mother-child relationship and child outcomes (Forman et al., 2007). Even if parenting appears to be the mechanism for risk transfer, depression alone may not be the cause. In fact, the effects of maternal depression on child outcomes have been found to be accounted for by demographic factors in some studies (e.g. Campbell et al, 2007). Consequently, it is important to examine whether children's eagerness to learn can be influenced by such factors as parental education and income.

Socioeconomic Status (SES)

The role of SES in child development outcomes has been a topic of great interest over the last few decades. Most measures of SES have included family income, parental education, and occupational status, although recent work suggests that occupational status may have only negligible effect on parenting and child development compared to income and education (Conger & Donnellan, 2007). Research in this area is based on the idea that low-SES families cannot provide their children with the same commodities, services, parenting, and networking that high SES families offer their children. Consequently, these low SES children become at risk for developmental problems. Indeed, low SES has been related to children's health problems, socioemotional difficulties and lower

cognitive and academic achievement (Bradley & Corwyn, 2002). It has also been found that low SES predicts children's externalizing and internalizing problems, lower cognitive and verbal abilities, academic failure, and lower motivation to learn in school (Bradley & Corwyn, 2002; Conger, Conger, & Elder, 1997; Huston, McLoyd, & Garcia Coil, 1997; Stipek & Ryan, 1997).

Parental behaviour and other family processes often mediate the association between SES and child development (Conger & Donnellan, 2007). That is, often, parenting explains the variation in child development associated with differences in SES. Indeed, parents with higher education levels are assumed to have greater knowledge of child development and parenting, thereby promoting academic and social competence through the ways they are teaching and parenting their children (Bornstein et al., 2003). Different aspects of parenting have been found to mediate this relation. These include parental support (motivation and encouragement provided by parents), parenting style (the balance of warmth versus control displayed by parents), and parental guidance (the amount of information and help parents are providing to their children) (Brooks-Gunn, Klebanov, & Liaw, 1995; Eccles & Harold, 1993; Hess & Holloway, 1984; Jarrett, 1995; Lee & Croninger, 1994). Indeed, there is a substantial body of evidence suggesting that one of the most direct ways through which SES affects child development is through parenting behaviours and child-rearing practices (Conger & Donnellan, 2007).

Maternal depression and SES

Poverty has been found to be a risk factor for depression, with 40 to 59% of low SES mothers scoring high on measures of depressive symptoms (Malik et al., 2007;

Brown & Moran, 1997). Given that these two variables are so highly related, a few studies have tried to disentangle the unique and combined influence of depressive symptomatology and socioeconomic context on child functioning.

Elgar et al. (2007) examined three areas of parenting that might be especially predictive of child adjustment problems, including lack of nurturance and positive involvement, parent-child hostility and rejection, and poor supervision and monitoring. Each parenting variable was investigated as a potential mediator between parental depressive symptoms and children's self-rated adjustment problems in 10- to 15-year-olds taking part in the Canadian National Longitudinal Survey of Children and Youth (NLSCY). Mediation was found for: 1) parental nurturance in the association between parental depressive symptoms and externalizing problems and prosocial behaviours; 2) parental rejection in the association between depressive symptoms and children's externalizing and internalizing problems; 3) parental monitoring in the links between parental depressive symptoms and internalizing problems and prosocial behaviours. Several of the effects found in the Elgar et al. (2007) study were at least in part due to demographic factors, indicating the presence of greater parenting difficulties in low-income families. Another specific area that might be influenced by both SES and maternal depressive symptoms is maternal teaching.

Maternal Teaching

Interactions during which parents act as teachers to their children are a crucial part of infancy and childhood (Wood, Bruner, & Ross, 1976). Two central qualities of parent-child interactions emerge in mother-child teaching interactions (Clark & Ladd,

2000). The first one is connectedness, defined as a 'coherence provided by the emotional availability of the caregiver in the presence of the infant' (Emde & Buchsbaum, 1990, p.44), which is an amalgam of positive engagement, mutual warmth, happy emotional tone, reciprocity, mutual intensity and mutual intimacy. Mothers who are less directive and provide more positive support to their children tend to have children who are more competent at the task at hand than are disapproving mothers (Fagot & Gauvain, 1997; Gauvain et al., 2002). However, some studies have found that children of parents who used more directives performed better on a subsequent learning task (Williamson & Silvern, 1986). Fagot and Gauvain (1997) also found that mothers' positive support was associated with greater involvement of the child in a learning task.

The second aspect central to parent-child relationships is autonomy support, defined as "the readiness of a person to assume another's perspective and to facilitate self-initiation and action" (Ryan & Solky, 1996, p.252). Autonomy support is made up of four different aspects: responsiveness, reflection of the child's activity, validation, and intrusiveness. Many studies have been conducted investigating the relations between parents' autonomy support and children's outcomes. Among them, Suchman and his colleagues (2007) found that both parental limit setting and autonomy support were important factors in children's behavioural and psychological adjustment. Indeed, parental limit setting predicts children's behavioural adjustment, but also less exploration and play on the children's part. In contrast, autonomy support predicts psychological adjustment. Similar results were found by Tamis-LeMonda et al. (2004) in a study with toddlers in which supportive parenting by both mothers and fathers predicted children's language and cognitive development, even after taking into account the effects of

demographic factors such as income, education, and marital status. Tamis-LeMonda and her colleagues also found that negative regard, intrusiveness and detachment were negatively associated with child outcomes, and more so for mothers than fathers. Grolnick and her colleagues (2002) children of mothers who were more supportive of their autonomy in a homework-like task (i.e. providing feedback and encouragement, checking when solicited, and waiting for the child to require assistance) were more creative and had greater conceptual understanding.

These positive effects of autonomy granting seem to persist across time. Indeed, Joussemet et al. (2005) found that autonomy support at age 5 was positively related to grade 3 social and academic adjustment. Autonomy support is also predictive of child's involvement in the task. Pratt et al. (1988) studied 24 middle-class parents and their 3 year-old children to investigate whether authoritative parents would be more sensitive to their child's success and failures during different tasks, and whether they would be more effective scaffolders. They found that the success of the child increased with parent intervention, and that authoritative parenting was positively correlated with better scores across tasks. These results provide construct validity for Vygotsky's definition of scaffolding, i.e. parents should give less support following success, more after failure, and this support is correlated with the child's participation in the task.

Studies have not only examined the effects of teaching on children, but also the effects of different factors such as SES and maternal depression on teaching. Many of the first studies of maternal teaching styles investigated the influence of SES and ethnicity on both parental teaching and its effects on children. For example, mothers from low SES

were found to give less specific information to their children in a block-sorting task (Brophy, 1970). In a study looking at the teaching behaviours of 163 African-American mothers, working-class mothers did not take sufficient time for reflection and planning when teaching their children and the quality of their language also differed from that of middle class mothers (Hess & Shipman, 1965).

Goldsmith and Rogoff (1995) studied sensitivity and teaching in 20 depressed and 20 nondepressed mothers interacting with another participant's child. Mothers were paired with another woman's child to examine specifically the teaching of the mother, regardless of the relationship with the child. Nondepressed women were found to be more sensitive, used more teaching strategies and more often shared the decision making with the child they were paired with than depressed mothers.

Taken together, there is evidence that both SES and maternal depressive symptoms have effects on the teaching behaviours of parents. However, to date there is no research exploring which one is a stronger predictor of teaching behaviours in parents or of children's motivation to learn. Both SES and maternal depression have been shown to predict academic failure, suggesting the possibility that children's motivation to learn is influenced by these factors from an early age.

The Present Study

The present study was designed to examine whether SES, maternal depression and maternal teaching were associated with children's motivation to learn from their mothers (see Conceptual Model; Figure 1). More specifically, this study examined the

potential role of maternal teaching strategies as a mediator of the link between SES, maternal depressive symptoms and children's motivation to learn.

It was hypothesized that children of mothers with higher levels of depressive symptomatology would be less eager to learn from their mothers because these children have less positive expectations of interactions with their mothers. In addition, it was expected that the relation between maternal depressive symptoms and children's eagerness to learn would be mediated by maternal teaching strategies. In particular, it was hypothesized that having more depressive symptoms would be associated with more demands, less warmth, and less positive feedback, which in turn would be associated with lower levels of eagerness to learn in children. Furthermore, it was hypothesized that the effects of maternal depressive symptoms on teaching and toddlers' motivation to learn would in part be accounted for by SES. These associations were examined both concurrently at two time points and longitudinally, with the links between SES and other variables expected to be stronger over time than for maternal depressive symptoms given the greater stability of SES.

Method

Participants

One hundred and nine (M = 26.40 months, SD = 1.73 months, range: 23.51-31.05 months; 57 boys) toddlers and their primary caregivers participated in the first wave of this study. Parent-child dyads were recruited from Montreal, Quebec, in the context of a larger study on children's collaborative learning. Recruitment was done through letters to daycares, as well as posters and newspaper ads (Appendix A).

Although the initial sample comprised 109 participants, the 8 fathers who participated in the larger study were excluded from the analyses for this particular study as the focus was on mothers. A total of 101 mothers and their children (56 boys) were part of the sample for this study, although complete data was only available for 94 of them. Participants spoke either French (35.6%) or English (64.4%), and parents were from various ethnic backgrounds (White/Caucasian: 72.3%; Asian: 4%; Black: 4%; Mixed/Other: 13.8%; Missing/does not wish to disclose: 5.9%). Participants also varied in their level of education (Not finished high school: 3.0%; High School/G.E.D.: 12.9%; College/Technical Training: 19.8%; Undergraduate University Degree: 38.6%; Graduate University Degree: 20.8%; Missing: 4.9%; Figure 2). The families participating in this study were living in various economic conditions, with the average total family income being in the $50-75,000 range ($0-25,000: 12.9%; $25,000-$50,000: 18.8%; $50,000-$75,000: 25.7%; $75,000-$100,000: 21.8%; >$100,000: 13.9%; Missing: 6.9%; Figure 3). The majority of mothers in the study were either married (71.2%) or cohabiting with the father of the child (14.9%), although a few were single-mothers (5.9%) or separated/divorced (4%) or did not volunteer that information (4%).

Participants who agreed to be contacted were called again for participation in the second wave of the present study (see consent forms in Appendix B). Seventy-seven mothers and their children participated in wave 2 of the study, and complete data was available for 54 of them (average age=40.96 months, SD=1.75). Five mothers had moved away, fifteen declined participation, and four were unreachable. Participation in the second wave of the study was not related to child gender, parental education, ethnicity or language. However, it was related to total family income, $t(92)=2.20$, $p=.03$, with parents

with lower incomes dropping out of the study more than parents with higher incomes. Depressive symptomatology was also related to drop out, $t(93)= -2.26$, $p=.03$. Mothers who dropped out of the study had greater amounts of depressive symptoms at wave 1 of the study than mothers who participated in the second wave of the study.

Complete data was available for 53 participants for the longitudinal analyses.

Procedure

All mother-child dyads participated in two 65- to 80-minute videotaped testing sessions which took place at Concordia University for each of waves 1 and 2. The two sessions at each wave were administered at approximately a week interval from each other (see Figure 4 for the order of activities at each wave). Each session included a period of time during which parents completed questionnaires, among which were a demographic questionnaire (Appendix C) and the Beck Depression Inventory-II (BDI-II: Beck, Steer, & Brown, 1996). Both sessions at each wave also included a block-building activity, during which child eagerness to learn and parent teaching were observed. In a room furnished with a child-sized table and chairs, mothers and their child were given a bucket of small wooden blocks of different colours and shapes. During the first session of each wave, the block-building was structured, in that mothers and their children had to reproduce two pictures using the blocks (see Appendix D). The pictures to be reproduced in the block-building activity were purposely chosen to be too difficult for the children to reproduce on their own. Given that activities must be matched to the child's developmental level for learning to occur (Vygotsky, 1978), this was an appropriate way of ensuring that parents would have to provide information for the child to be able to

reproduce the images. At the second session, the block-building activity was unstructured: mothers were instructed to build whatever they wanted with their child, as long as they built it in collaboration with their child. They were also told that the experimenter would take a photograph of them with what they built together at the end of the activity. The block-building activity lasted 5 minutes at wave 1 and 6 minutes at wave 2. However, for coding purposes, only the first 5 minutes of the block-building activity at wave 2 were used, in order to permit a direct comparison in the amount of task information provided by parents between wave 1 and wave 2. Having the same length of observed each session also allowed us to compare the first structured session to the second unstructured one. Other activities were also part of each session, but were not included as part of this study. To thank children for their participation, they were given a colouring book and a ball at wave 1, and a bouncing ball and magnetic stickers at wave 2. Parents were given 20$ at the end of each wave 1 visits, and 25$ at each of wave 2 visits. See Figure 2 for the order of the activities.

Parent questionnaires. At session 1 of both waves 1 and 2, parents had 12 minutes to fill out a demographics questionnaire, the BDI-II (Beck, et al., 1996), and the Early Childhood Behavior Questionnaire (ECBQ; Putnam, Gartstein & Rothbart, 2006), which they could complete at home if they ran out of time. The demographics questionnaire included questions regarding the composition of the family (parents' marital situation and presence and age of brothers and sisters), language spoken at home and by the child, and information regarding the level of education of mothers and total family income. These last two variables were used to create a socioeconomic status index for the present study

by taking the average standardized score for both education and income for each participant.

The BDI-II, a widely used measure of depressive symptoms, was used as part of this study. This scale is a 21-item questionnaire measuring, on a 4-point scale, the absence/presence and the severity of depressed feelings, behaviours, and symptoms. The reliability of this tool has been well established. After more than 25 years of research using the earlier version of this questionnaire, Beck, Steer and Garmin (1988) found that its mean coefficient alpha for nonpsychiatric samples was .81. Scores on the BDI can range from 0 to 63, with greater scores indicating greater levels of depressive symptoms and impairment, with scores above 12 usually considered to be the cut-off for mild depression. At wave 1, the scores for this sample ranged from 0 to 36, with 73.7% of the mothers scoring below 12, which suggests that most of our sample did not exhibit clinically significant levels of depressive symptoms. At wave 2, 80.9% of mothers participating in the study scored below 12 on the BDI-II. Most of our sample would therefore be considered as exhibiting normal levels of depressive symptoms and scoring in the normal range. The average score for depressive symptoms did not change from wave 1 (M= 8.32, SD=7.03) to wave 2 (M= 6.60, SD=5.56, $t(65)$=1.00, p=.32).

This study used maternal self-report for maternal depressive symptoms and SES only. Indeed, the importance of independent data has been highlighted by several researchers (Forman et al., 2003; Burt et al., 2005) as it has been found that it is likely that depressed mothers' self-reports of parenting and child outcomes are influenced by depressive symptoms. Burt et al. (2005) found that parenting mediated the relationship

between maternal depressive symptoms and child emotional and behavioural problems when only maternal reports were used. However, when multiple informants and time points were used in the assessment of the mediation of parenting of the association between maternal depressive symptoms and adolescent psychopathology, only partial mediation was found. These results highlight the importance of using a combination of different methodologies. Therefore, observations of parenting were used in this study as they are a stricter and more valid test than possibly biased maternal self-reports.

Behavioral Coding and Data Reduction

Three different coding systems were used in this study. The first two coding systems to be described here (Amount of Information and Motivational and Emotional Support) were both developed for the present study to examine different aspects of parent teaching. The coding system for eagerness to learn was adapted from a responsive imitation coding system designed by Forman and Kochanska (2001). For each coding system, a graduate student was the primary coder and met regularly with the one or two undergraduate students also on the coding team. The primary coder trained the undergraduates on the coding system for both waves 1 and 2, ensuring stability of the scores across time, and also coded half the cases for all coding systems. Undergraduate students, who were blind to the study's hypotheses, were trained until acceptable reliability coefficients were attained (kappas above .65, or average intraclass correlation above .80: see Tables 1 and 2 for descriptive and reliability coefficients). Disagreements were resolved through discussion between the team members.

Amount of Task Information. The amount of task-related information provided by mothers during the block-building was coded using videotapes of the observations made during the block-building task. The coding was done in 10-second intervals. Task information was defined as the amount of parents' speech or gestural behaviour that could facilitate their children's understanding or completion of the required task, or that provided general information or knowledge, which may or may not directly relate to the required task.

The information provided by mothers was classified into five different categories, which were partly inspired from the coding system used by Gauvain et al. (2002). The first three categories were considered informative and were added together to form a total task information score.

1) Simple: Information considered to be 'simple' covered only one aspect of the block building, such as what block to use, where to put it, or how to place it. Examples of parental speech coded as simple would be 'Take the blue one' or 'Put it on top', whereas simple parental behaviour could include pointing or showing where to put a block.

2) Property/Strategy: Information coded in this category included information related to three different aspects of block-building: 1) the strategy to be adopted (for example, explaining that they are going to build what is on the picture); 2) an explanation of how a property of a block is related to the goal of the activity, in this case building; or 3) a demonstration from the parent on how to go about building something. It is important to note that if the mother is building on her

own, without words or gestures conveying the intention to communicate something to the child, her actions are not considered as a demonstration and hence, are not coded. Examples of strategy/property statements include: 'Put the long sides together, they will fit.'; 'We have to build this castle.'

1) Complex: In order to be considered 'complex', the information provided by the parent must relate to at least two aspects of block building. Any combination of at least two of what, where, and how is acceptable in this category. Examples of complex statements from parents include: 'Put the blue block on top of the red one.'; 'Take the two bridges and put them together.'

These three categories held a different weight in the calculation of the total information score; simple information was given a weight of 1, strategy/property information a weight of 1.5, and a weight of 2 was given to complex information. This was done in order to convey the amount of information that was provided by mothers in a given sentence.

For these three categories, parental speech and behaviour is coded as to whether it is unimodal or bimodal. Unimodal information is information that is provided either physically or verbally. For example, if the parent points to where the block the child is holding should go, this is considered unimodal simple information. If the parent said 'Put it there' at the same time, this information would be considered bimodal. These verbal and gestural categories were added to calculate a parent's total information score. That is, the score of 1 for simple information is multiplied by the weight of 1 for unimodal information, whereas it is multiplied by 2 for bimodal information. Parents were given

the best score they could get for each of the three categories, but codes could be present for all categories (i.e. a parent could give, in one interval, a unimodal simple and a bimodal property/strategy, for a total of 4 points for that interval). Reliability for the total information score was good at both wave 1 and wave 2 (Tables 1 and 2).

The last two categories (uninformative and labelling/colour) were initially intended to be added together and given a negative value to form an 'unhelpful teaching' score as they do not help the child perform the task and are too low-level teaching for the children's age. Because these two codes were relatively infrequent in our sample, and also because of the low reliability of the total 'uninformative' score, this variable was excluded from subsequent analyses.For a more detailed description of the coding system, consult Appendix E.

Motivation and Emotion Support. A coding system for motivational and emotional support was developed for the present study based on coding systems used by Clark & Ladd (2000) and Tamis-LeMonda et al. (2004). In this study, motivational and emotional support refer to the parental behaviours that facilitate the recruitment and maintenance of the child's attention to and interest in the required task and that motivate the child to pursue the activity. It also includes emotionally supportive behaviours, such as parent's sensitivity to child's affect, praising the child, and showing empathy for the child's distress.

Six different variables were coded in 30-seconds intervals during the block-building activity to make a final motivational and emotional support score.

Balance of positive versus negative feedback. This was a measure of the balance of positive versus negative feedback the parent provides the child during the block building activity. For each interval, mothers were given a score from 1 to 5, with scores of 1 given when mothers only provided negative feedback that was not softened in any way, to scores of 5, when mothers provided many instances of positive feedback, with no negative feedback for the whole interval.

Warmth. This scale referred to how much the mother approved of what the child was doing, and how much soothing, love, and sympathy she provided to the child. The opposite of warmth on this scale is hostility, defined here as displays of coldness, sarcasm, resentment, and putting down of the child. When one clear instance of such displays of hostility was observed, it warranted a score of 1. Mothers who provided notable or extensive soothing, love, sympathy, frustration control, or pride received scores of 5.

Demands versus autonomy promotive suggestions. Based solely on verbal behaviour, this scale stemmed from the idea that an autonomy supportive mothers will tend to give more suggestions than demands, leaving place for the child to execute the task in the way he/she thinks is appropriate. To receive a score of 1 for a given interval, mothers only made non-softened demands to the child (e.g. Put this one there).To receive a score of 5, parents had only made reflections on the child's ongoing activity or asked him/her open-ended questions such as 'What would you like to put now?'

In order to form a single 'Motivation and Emotion Support' variable, a factor analysis was ran with the variables 'Feedback', 'Warmth', and 'Demands'. At wave 1, it

yielded a single factor with an eigenvalue of 1.82, which explained 60.69% of the shared variance among the three variables (Table 3). At wave 2, the factor analysis with the same three variables yielded a single factor with an eigenvalue of 1.67 explaining 55.61% of the shared variance between the variables (Table 4).

The codes for *Enthusiasm* and *Intrusiveness versus Autonomy Support* were both dropped because of low reliability. The code for *Attention Recruitment* was also dropped from analyses as it was found to occur infrequently in this sample and to be unrelated to most of the other measures in the coding system, even though it was highly reliable. ICC for the different measures at wave 1 can be found in Table 1. No ICC were calculated for wave 2 because the coding was done by the same team as for wave 1. The complete description of the coding system can be found in Appendix F.

Eagerness to Learn. Eagerness to learn from the parent was also coded in the block-building activity. Coding was done in ten 30-second intervals, beginning when the experimenter would say 'I'll be back in 5 minutes' for the block-building activity. Several components of the child's motivation were examined in the coding of eagerness to learn, such as the child's posture and orientation (toward the parent or not), verbal communication with the parent (sharing of ideas, asking questions, etc.), child's actions (especially important to consider when they do not match the verbal communication) and affect, sharing and collaborating with the parent, imitation (e.g. repeating the parent's instructions, pointing to the same block, etc.), eagerness and enthusiasm, and modifications of behaviours in response to parent's instructions.These were coded only examining the children's behaviours, independently of parental behaviours. However, as

the parent and child are interacting, it is likely that parental behaviours in this situation will influence the child's.

For each 30-second interval, coders gave a motivation code using the following 4-point scale.

> 0 = The child is clearly not eager to learn from the parent. He or she does not cooperate and share with the parent, and may walk away or run around the room in order not to be involved in the activity.
>
> 1 = The child is partially involved in the activity but focuses mostly on the object. His/her motivation to cooperate with the parent is fair, but not good. The child is not really looking at the parent and is not very involved in the learning process. He/she may ignore the parents and/or show impatience toward the parent.
>
> 2 = The child's motivation to share and collaborate with the parent is good, but not great. The child is attentive and responsive to the parent, although mostly oriented on the activity or object rather than on the parent.
>
> 3 = The child is clearly eager to learn from the parent, and there is a 'spark' that seems to occur between the child and the parent. They are both enjoying the activity and positive affect clearly dominates the interaction.

Coders had to select the code that was the most appropriate to describe the child's motivation in each interval (see Appendix G). Thus, although the child may not have demonstrated a constant and equal level of motivation throughout the interval, coders assigned the code that was the best approximation of the overall quality of the child's

motivation and eagerness to learn from the parent. Coders were highly accurate at detecting mean differences between children and between tasks, as revealed by the ICC coefficient (Table 1). No ICC for child motivation to learn is reported in Table 2 because the same team coded both times.

Standardized scores were used in order to create an overall 'Eagerness to learn' index based on sessions 1 and 2 eagerness to learn scores in the block-building task, for both waves 1 and 2. The correlations between session 1 and session 2 were .33 ($p<.01$) and .23 ($p=.04$) for wave 1 and wave 2, respectively.

Results

The relation between SES and maternal depressive symptoms was examined first (See Table 5 for intercorrelations among all study variables). At wave 1, lower SES was found to predict higher BDI-II scores ($r=-.25$, $p=.02$). However, this relation was no longer significant at wave 2 ($r=-.015$, $p=.90$). Nonetheless, all analyses were conducted controlling for both variables to ensure that the reported associations were not influenced by the association with the other variable. Additionally, all analyses were performed controlling for child age at the time of the first session as age was found to be related to motivation to learn.

Cross-Sectional Analyses-Wave 1

The first objective of this study was to investigate the cross-sectional effects of maternal depression and SES on children's motivation to learn from their mothers and to assess whether these effects were mediated by parental teaching strategies. This was done

first when children were on average 26.5 months, at wave 1. Baron and Kenny's (1986) approach for testing mediation was used to analyze the hypothesis of the current study. All three conditions were tested using multiple regression analyses. The first condition for mediation is that the independent variables (IV), in this case, SES and maternal depressive symptoms, significantly predict the mediator. First, SES was entered as a predictor of the amount of information provided by mothers in the block-building task, and was found to be significant (β=.22, p=.03). However, this relation only existed when maternal depressive symptoms were not controlled for; when depressive symptoms were controlled for, the relation between SES and amount of information became a trend (β=.20, p=.06). This occurred even though maternal depressive symptoms were not a significant predictor of the amount of information provided during the block-building activity at wave 1 (β=-.12, p=.24). The same analysis was performed with SES as a predictor of motivation support provided by mothers, and it was found that SES was positively associated with the balance of feedback, warmth, and suggestions mothers provided during the block-building activity (β=.26, p=.00). When maternal depressive symptoms were entered in the analysis (β=-.07, p=.51), the results remained the same (β=-.27, p=.01). The first condition for mediation was met only for SES in predicting the motivation support mothers provided in the block-building activity, and marginally predicting the amount of task information.

The second condition for mediation requires that the IV predicts the outcome variable, in this case, children's motivation to learn. Both SES and symptoms of depression were entered as predictors of children's motivation to learn, in order to obtain

the independent effect of each IV on the outcome variable. At wave 1, it was found that maternal depressive symptoms did not predict motivation to learn (β=-.11, p=.28), whereas SES was found to be positively associated with children's motivation to learn (β=.22, p=.03). The second condition for mediation was only met for SES.

The third condition for mediation, whether the mediator predicts the outcome, was finally assessed. Motivation support and amount of information provided by mothers were both found to be predictors of motivation to learn at wave 1 (respectively, β=.30, p<.01 and β=.30, p<.01). Thus, all the conditions were met to assess whether motivation support mothers provided in this block-building activity mediated the relation between SES and children's motivation to learn. Another multiple regression analysis was performed to test whether the association between SES and children's motivation to learn would disappear after accounting for motivation. It was found that once age, SES, and motivation support were entered in a regression analysis to predict children's motivation to learn, SES no longer predicted motivation to learn, which indicated that motivation support mediated the relation between SES and motivation to learn. The Sobel test was used to determine whether the drop in beta values for the direct link between SES and children's motivation to learn was significant. The hypothesis that motivation support from mothers would mediate the relation between SES and motivation to learn in toddlers at wave 1 was supported (z=2.08, p=.04). Consult Table 6 for the summary of the regression analyses for wave 1.

Cross-Sectional Analyses-Wave 2

The same type of regression analyses were also conducted for the second wave of data, when children were on average 40.9 months old, again using Baron and Kenny's (1986) approach to test for mediation. Again, the first condition for mediation is that the independent variables (IV), in this case, SES and maternal depressive symptoms, significantly predict the mediator. First, a regression analysis was conducted to assess whether maternal depressive symptoms predicted the amount of information mothers gave their children in the block-building activity, but this relation was not found in this sample (β=-.12, p=.41). In addition, SES did not predict the amount of task information provided either (β=.12, p=.41). Second, another regression analysis was performed to assess whether depressive symptoms predicted the motivation support mothers provided their child in the block building activity. There was a trend for maternal depressive symptoms to predict motivation support (β=-.23, p=.07).

Even though there was no possible mediation, the second condition for mediation was still tested. The results for this wave of data were roughly the opposite of what was found at wave 1. Indeed, SES was not found to be a predictor of children's motivation to learn (β=.03, p=.78). However, maternal depressive symptoms were found to predict motivation to learn (β=-.34, p=.01). The same steps were followed to assess whether the amount of information and motivation support provided by mothers mediated the relation between maternal depressive symptoms and children's motivation to learn. First, a regression analysis was conducted to assess whether maternal depressive symptoms predicted the amount of information mothers gave their children in the block-building activity, but this relation was not found in this sample (β=-.12, p=.41). In addition, SES

did not predict the amount of task information provided either (β=.12, p=.41). Second, another regression analysis was performed to assess whether depressive symptoms predicted the motivation support mothers provided their child in the block building activity. There was a trend for maternal depressive symptoms to predict motivation support (β=-.23, p=.07).

Although no possibilities for mediation was found at wave 2, regression analyses were performed to examine whether motivation support and the amount of information provided by mothers were still predicting children's motivation to learn. Motivation support was still found to be a strong predictor of motivation to learn when children were aged 40 months (β=.58, p<.01). The amount of information provided by mothers was also found to predict motivation to learn (β=.27, p=.04), although it was not found to as good of a predictor as motivation support. The regression analysis summary can be found in Table 7.

Longitudinal Analyses

The last objective of this study was to examine whether SES, maternal depressive symptoms and parent teaching strategies had lasting effects on children's motivation to learn. This is important as depression is often a long lasting problem and that SES tends to be fairly stable. In the present study, maternal depressive symptoms at wave 1 were strongly correlated with depressive symptoms at wave 2 (r=.56, p<.01). SES was also found to be quite stable from wave 1 to wave 2 (r=-.93, p<.01).

Regression analyses were performed to examine whether wave 1 SES and maternal depressive symptoms predicted wave 2 motivation to learn. These analyses were performed controlling for child age at wave 2. Neither SES nor depressive symptoms at wave 1 were found to predict children's motivation to learn at wave 2 (respectively, β=.06, p=.62 and β=-.04, p=.76).

Regression analyses were then performed to examine whether the parents' teaching strategies at wave 1 predicted children's eagerness to learn at wave 2. The amount of information provided by mothers at wave 1 did not predict children's motivation to learn at wave 2 (β=.16, p=.19). However, the motivation support mothers provided when their children were aged 26 months predicted motivation to learn when children were 41 months (β=.35, p<.01). This relation was largely accounted for by the high stability of motivation support from wave 1 to wave 2 (r=.45, p<.01). Indeed, after controlling for the motivation support at wave 2, motivation support at wave 1 no longer predicted children's motivation to learn at wave 2 (β=.10, p=.41). It is also important to note that children's eagerness to learn from at wave 1 was moderately correlated with their eagerness to learn at wave 2 (r=.44, p<.01). However, that association was no longer significant once motivation support at wave 1 was entered in the analysis. Consult Table 8 for the longitudinal regression analysis summary.

Supplemental analyses were conducted to examine the directionality of the longitudinal results, and more specifically to examine whether motivation to learn at wave 1 would predict changes in maternal teaching and depressive symptoms. First, contunuity in the amount of information provided by mothers were examined in a linear

regression analysis, entering wave 1 amount of information and child responsiveness, while controlling for age at wave 2. The amount of information provided at wave 1 was found to be a significant predictor of the amount of information provided at wave 2 (β=.36, p=.01). However, motivation to learn at wave 1 did not predict changes in the amount of information provided by mothers from wave 1 to wave 2 (β=-.02, p=.88). The same steps were followed for the motivation support provided by mothers, with motivation support at wave 1 significantly predicting motivation support at wave 2 (β=.45, p<.01). Again, motivation to learn in children at wave 1 did not predict the motivational support they received from their mothers at wave 2 (β=.07, p=.52). Finally, the same analysis was conducted for maternal depressive symptoms. It was found that mothers' BDI-II score at wave 1 was predictive of their BDI-II score at wave 2 (β=.55, p<.01) but that motivation to learn in children at wave 1 did not predict maternal depressive symptoms at wave 2 (β=.01, p=.92).

Discussion

The first goal of the present study was to disentangle the effects of SES and maternal depressive symptoms on children's motivation to learn and to examine whether parental teaching (which was defined as the amount of information and quality of motivation support provided by mothers) mediated the relation between the predictors and outcome. This was achieved with two different waves of data, to examine whether any relations found would be consistent across time. When children were aged 26 months, SES predicted children's motivation to learn and this relation was explained by the amount of information and the motivation support provided by mothers. However,

maternal depressive symptoms were not a predictor of either parental teaching or motivation to learn in toddlers.

Quite a different pattern of results was found at wave 2. When children were aged 41 months, SES no longer predicted motivation to learn, whereas maternal depressive symptoms were now a negative predictor of toddler's eagerness to learn from their mothers. This result was in the direction expected, with children of mothers with greater amounts of depressive symptoms showing less motivation to learn. Maternal depressive symptoms were found to be a marginal predictor of motivation support, and it is likely that this relation was not found due to the relatively small sample size, leading to limited power. Motivation support provided by the mothers was found to be a strong predictor of motivation to learn when children were aged 41 months.

These results suggest that as children age, SES does not have as strong of an effect on motivation to learn and on mothers' teaching strategies. However, the effects of maternal depressive symptoms appear to grow with time, affecting the motivation support mothers provide their children and their children's motivation to learn from them once children have reached age 3. One possible explanation for this is that depression tends to last and could eventually strain the relationship with the child, so much so that the child is less eager to participate in learning activities with the mother, although this is not yet evident in this type of activity at age 2. Given that children's motivation to learn from their mothers is believed to be at least partly due to a mutual-responsive orientation between the mother and child (Forman & Kochanska, 2001; Kochanska, Forman & Coy,

1999), it is likely that by age 3, children notice the lack of responsiveness of their depressed mother and in turn show less enthusiasm in learning from them.

A second goal of this study was to examine whether SES and maternal depressive symptoms had lasting effects on children's motivation to learn and parenting. However, both SES and maternal depressive symptoms were not found to predict changes in children's motivation to learn over time. This was not consistent with previous research which has found that both SES and maternal depressive symptoms have been linked to academic failure (Conger, Conger & Elder, 1997; Conrad, Fogg & Willis, 1995). In fact, it seems reasonable to believe that early motivation to learn could influence later academic motivation and failure. This would have important implications for the timing of interventions if such effects were found.

It was also important to examine whether the teaching strategies mothers use, regardless of their SES and depressive symptoms, would have effects on their children's motivation to learn across time. Although the amount of information mothers provided their children at wave 1 was associated with concurrent motivation to learn, it did not predict children's eagerness to learn later on. This may be because when children are younger, they need more guidance regarding how to perform the task, and this is particularly important in low-SES families. Indeed, children from disadvantaged families would experience a deficit in the meaning of particular acts and would fail to relate it to the previous acts and what should happen next (Hess & Shipman, 1965). Receiving less information from their mothers could be important earlier on, but may play less of a role later on when children have a better understanding of the task at hand.

However, the results of the present study indicate that there may be other aspects of parent teaching that can have lasting effects on children's eagerness to learn. Indeed, the motivation support provided by mothers when children were 26 month-old predicted motivation to learn in toddlers at that time, but also 15 months later. The longitudinal effects of motivation support at 26 months on motivation to learn at 41 months were seen over and above the effects of motivation to learn at 26 months. The way mothers encouraged their children to pursue in the block-building activity was relatively stable over time and predicted long-term motivation to learn in toddlers. The results of the present study indicate that providing young children with positive feedback, warmth, and more suggestions would have positive effects on children's learning behaviours in the future, although the extent of the longevity of these effects remains unknown at the present. This has important implications, especially for interventions with parents. Indeed, interventions targeted at mothers of toddlers should emphasize the importance of maternal teaching and motivational behaviours to the future eagerness to learn of their children.

In order to establish the directionality of results, patterns of change over time were examined in order to assess whether early child motivation to learn would predict changes in the parent variables over time, both in their teaching and in their mood. It is possible that mothers who have an unmotivated child feel less competent as teachers and as mothers, impacting both their teaching behaviours and depressive symptoms. However, early child motivation to learn did not predict changes in parental teaching or depressive symptoms over time. This finding reinforces the idea of providing

interventions with parents to improve their teaching skills, rather than performing interventions for toddlers to be more motivated.

One of the strengths of this study lies in the extensive behavioural measures used to examine both maternal and child behaviours. Except for maternal depressive symptoms and SES, which were gathered from self-report questionnaires, all study measures were coded by independent coding teams. Having independent coding teams for different variables ensures that the associations observed between these variables is not due to the biased interpretation of a coder of multiple aspects of the same interaction. Moreover, most measures yielding good reliability except for some of the motivation support variables. Indeed, the coding of enthusiasm and intrusiveness in the block-building task had to be dropped as they failed to meet acceptable criteria for reliability. There is a need to develop ways to reliably measure these variables so as to better measure the impact motivational support has on toddlers' and children's eagerness to learn. This is important as the initial hypotheses of the present study were formulated when enthusiasm and intrusiveness were included in the study, and both of these variables were expected to be related to depressive symptoms (Downey & Coyne, 1990; Field et al., 1990; Goodman & Gottlieb, 2002).

Another strength of this study is the community sample representative of the population in the area of Montreal, which allows for generalizability of our results to a large population. Given that we did not have a clinical sample and were only measuring depressive symptoms in a community sample, it indicates that even non-clinical levels of depressive symptoms can have effects on parenting and children's motivation to learn.

However, use of a community sample can also make it more difficult to test for the detrimental effects of low-SES because most of our sample was middle class.

Another important limitation of this study is that the sample size decreased from wave 1 to wave 2 and that attrition was related to BDI-II scores at wave 1. Indeed, mothers who had greater amounts of depressive symptoms at the first wave of the study were less likely to participate in the study at wave 2. Attrition was also marginally related to SES, with mothers from a lower socioeconomic background less likely to take part in the second wave of the study. This made the testing of our hypotheses and interpretation of the results more difficult. More specifically, the smaller sample size lead to reduced power to detect wave 2 and longitudinal effects. It is also likely to have biased our findings, although one would expect that the effects we found are likely to be larger. However, problems with attrition are to be expected in longitudinal studies requiring a lot of time and effort from parents. Longitudinal studies such as this one allow for better understanding of different mechanisms, and certainly contributed in disentangling the important factors associated with toddlers' motivation to learn. Having more than two time points would undoubtedly help clarify some of the findings of the present study.

Attention must be paid to the way parents engage in learning activities with their toddlers because the way parent teach and motivate their children may have an impact on children's motivation to learn from their parents. Because it is not clear from this study how much of a lasting effect SES and maternal depression have on parenting and children's motivation to learn, it might be more helpful to study individual differences in

parenting and how those influence children's development. More longitudinal studies with multiple time points are warranted to examine the early predictors of motivation to learn in school, and whether these are related to socioeconomic status, maternal depression, and /or parental teaching strategies. This would provide insight as to where interventions can be applied during children's early years to make them more motivated to learn in school, and could potentially have effects on later achievement and learning behaviours (Stipek & Ryan, 1997). This type of longitudinal research would also clarify the impact of SES and maternal depressive symptoms on parenting and children's motivation to learn, which has not been achieved in this study given the mixed results obtained over only two time points.

Table 1

Reliability Coefficients and Descriptive Statistics for the Study Variables- Wave 1 Measures

	M	*SD*	*ICC*
Task Information			
Uninformative	-1.58	1.56	.54[x]
Informative (weighted average)	47.41	18.40	.89
Motivation Support			
Balance of Feedback	3.37	.71	.77
Enthusiasm	2.75	.47	.55[x]
Warmth	3.13	.27	.69
Demands vs. Suggestions	2.77	.54	.86
Intrusiveness	-	-	-[ax]
Attention Recruitment	1.35	.58	.96
Eagerness to Learn			
Block-building	1.58	.46	.92

Note. Dashes indicate that reliability *ICC* was not calculated. Reliability was based on 20 or 21 cases. [a] Reliability was too low after 10 cases and the measure was not further coded. [x]Variable was excluded from further analyses because of low reliability.

Table 2

Reliability Coefficients and Descriptive Statistic for the Study Variables- Wave 2 Measures

	M	*SD*	*ICC*
Task Information			
Uninformative	-.57	1.01	-
Informative (weighted average)	48.69	13.79	.94
Motivation Support			
Balance of Feedback	3.41	0.54	-
Enthusiasm	2.99	0.41	-
Warmth	3.15	0.20	-
Demands vs. Suggestions	2.79	0.43	-
Intrusiveness	-	-	-
Attention Recruitment	0.49	0.68	-
Eagerness to Learn			
Block-building	1.88	0.31	.92

Note. Reliability was based on 20 cases. Dashes indicated that reliability ICC was not calculated (two same coders as wave 1).

Table 3

Factor Loadings for the Motivation & Emotion Support Variables at Wave 1

Measure	Factor 1
1. Feedback	.76
2. Warmth	.80
3. Demands	.78

Note. 60.69% of variance explained. Eigenvalue: 1.82

Table 4

Factor Loadings for the Motivation & Emotion Support Variables at Wave 2

Measure	Factor 1
1. Feedback	.77
2. Warmth	.79
3. Demands	.68

Note. 55.61% of variance explained. Eigenvalue: 1.67

Table 5

Intercorrelations Among Study Variables

Measure	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. BDI score W1	.52**	-.19	-.26‡	-.16	-.04	-.16	.02	-.03	-.19
2. BDI score W2	-	.00	-.05	-.10	-.36**	-.11	-.11	-.07	-.22
3. SES W1		-	.96**	.28*	.10	.28*	.22	.15	.26‡
4. SES W2			-	.31*	.07	.21	.11	.13	.21
5. Eagerness to Learn W1				-	.44**	.31*	.10	.42**	.40**
6. Eagerness to Learn W2					-	.18	.29*	.41**	.61**
7. Amount of Information W1						-	.36**	.08	.17
8. Amount of Information W2							-	.10	.12
9. Motivation Support W1								-	.56**
10. Motivation Support W2									-

Note. Correlations shown here are partial correlations controlling for age at W1 and at W2.

‡$p < .10$. *$p < .05$. **$p < .01$.

Table 6

Stepwise Regression for the Cross-Sectional Prediction of Eagerness to Learn at W1

Predictors	*t*	*p*	*β*
Outcome: Children's Eagerness to Learn at W1			
Step 1			
Child Age W1	2.16	.03	.22
Step 2			
Child Age W1	2.48	.02	.25
SES W1	2.42	.02	.25
BDI score W1	-.85	.40	-.09
Step 3			
Child Age W1	2.41	.02	.22
SES W1	1.12	.27	.11
BDI score W1	-.73	.47	-.07
Amount of Information W1	3.20	.00	.30
Motivation Support W1	3.08	.00	.29
Overall $R^2 = .29$, $F(2, 88) = 10.33$, $p = .00$			

Note. N=94

Table 7

Stepwise Regression for the Cross-Sectional Prediction of Eagerness to Learn at W2

Predictors	*t*	*p*	*β*
Outcome: Children's Eagerness to Learn at W2			
Step 1			
Child Age W2	1.30	.20	.18
Step 2			
Child Age W2	1.98	.05	.27
SES W2	.47	.64	.06
BDI score W2	-2.74	.01	-.37
Step 3			
Child Age W2	1.11	.27	.13
SES W2	-.66	.50	-.07
BDI score W2	-1.19	.06	-.21
Amount of Information W2	1.93	.06	.21
Motivation Support W2	4.91	.00	.56

Overall $R^2 = .48$, $F(2, 48) = 14.77$, $p < .01$

Note. $N = 54$

Table 8

Stepwise Regression for the Longitudinal Prediction of Eagerness to Learn at W2

Predictors	*t*	*p*	*β*
Outcome: Children's Eagerness to Learn at W2			
Step 1			
Child Age W2	1.40	.17	.18
Step 2			
Child Age W2	1.33	.19	.17
SES W1	.41	.68	.05
BDI score W1	-.36	.72	-.05
Step 3			
Child Age W2	1.21	.23	.15
SES W1	-.62	.54	-.08
BDI score W1	-.27	.79	-.03
Amount of Information W1	1.39	.17	.17
Motivation Support W1	2.98	.00	.37
Overall $R^2 = .19$, $F(2, 57) = 5.51$, $p < .01$			

Note. N=53

Figure 1- Theoretical model

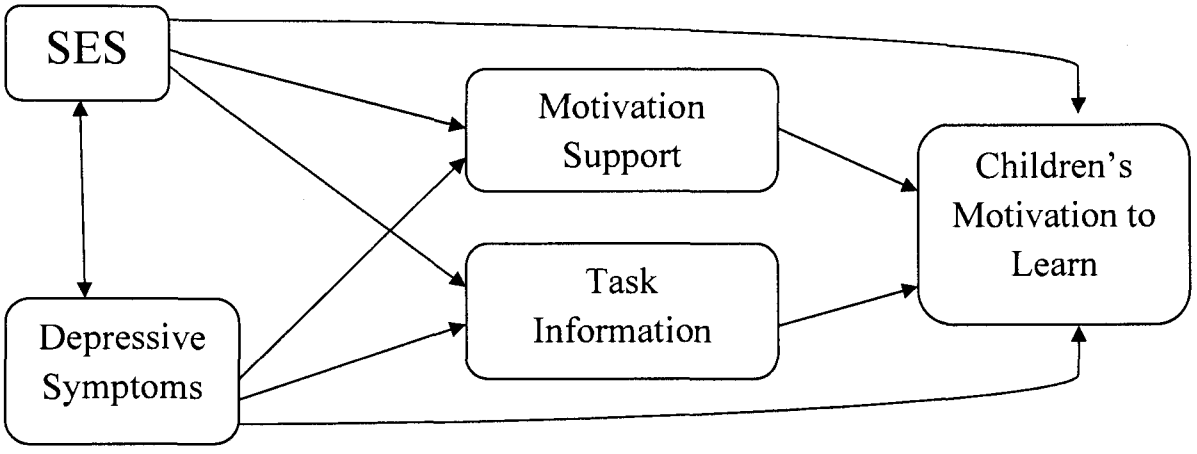


Figure 2. Distribution of Education

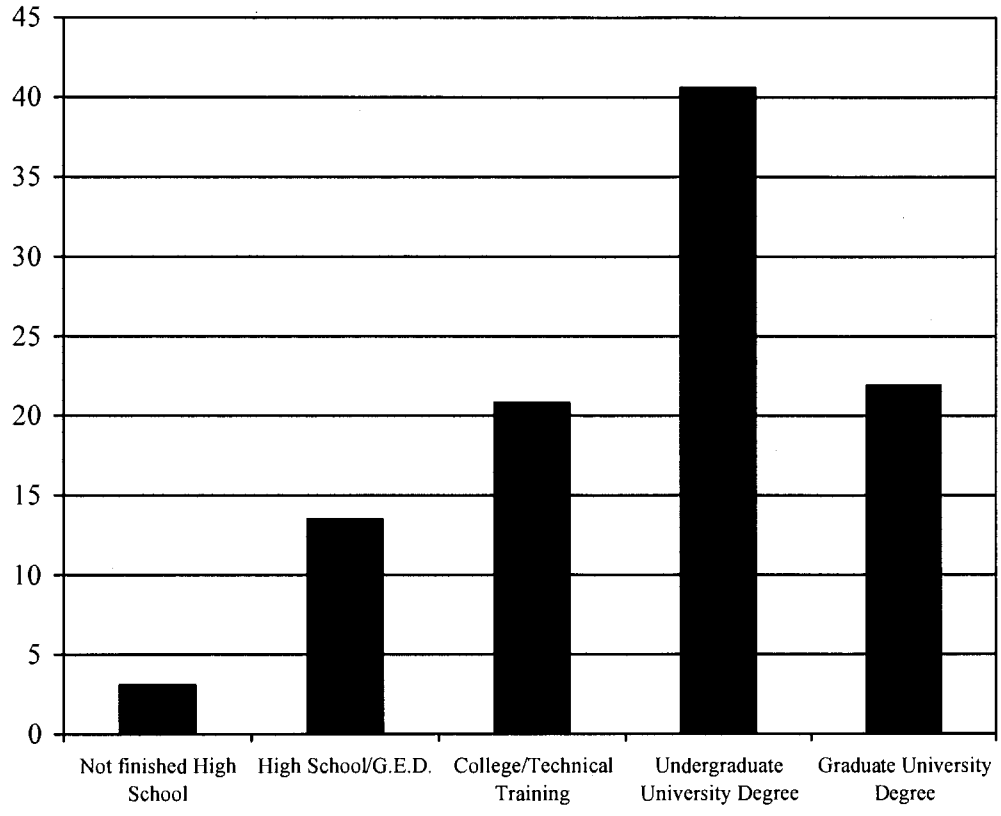


Figure 3. Distribution of Total Family Income at Wave 1 and 2 (in %)

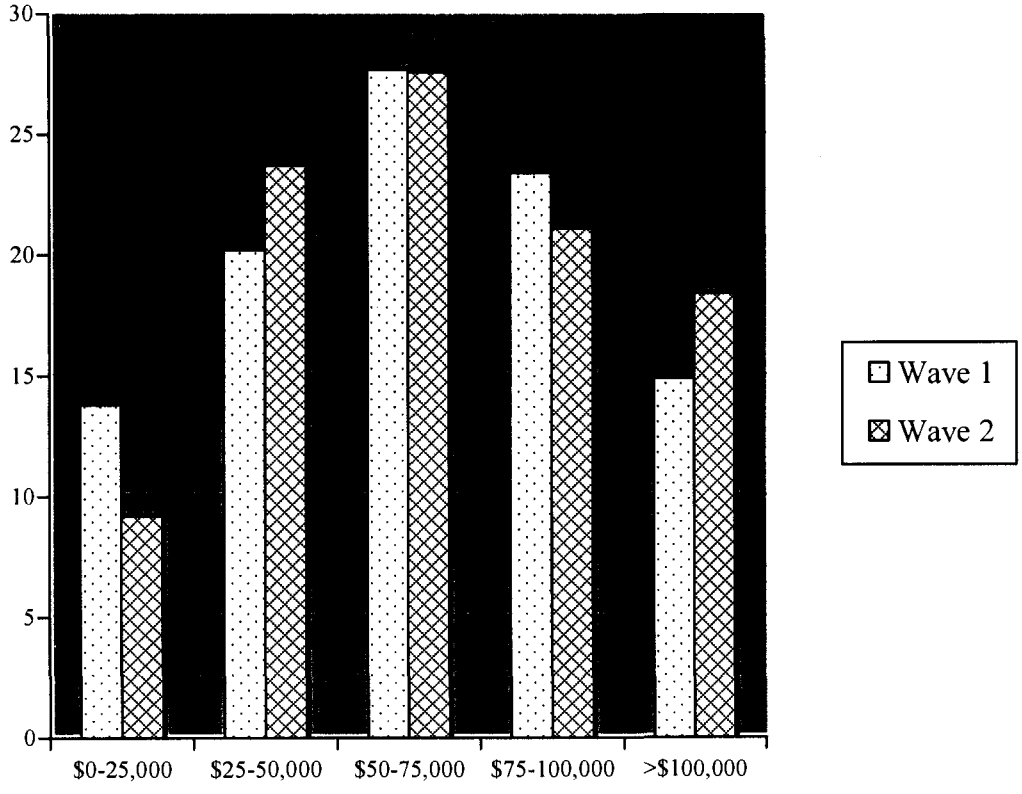
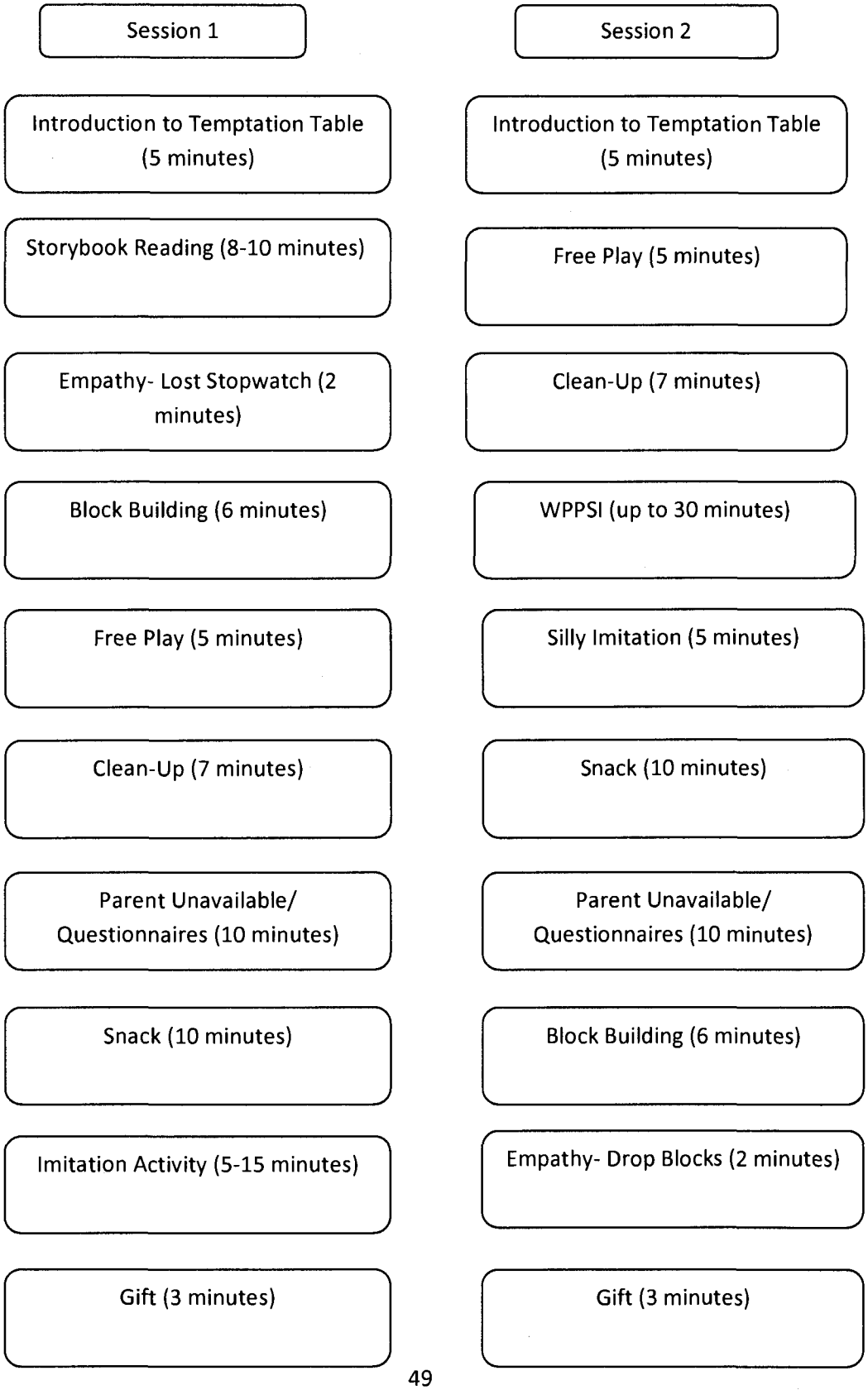


Figure 4. Order of Activities

Wave 1

Wave 2


Session 1
Session 2
Introduction to Temptation Table (5 minutes)
Introduction to Temptation Table (5 minutes)
Storybook Reading (8-10 minutes)
Free Play (5 minutes)
Empathy- Lost Stopwatch (2 minutes)
Clean-Up (7 minutes)
Block Building (6 minutes)
WPPSI (up to 30 minutes)
Free Play (5 minutes)
Silly Imitation (5 minutes)
Clean-Up (7 minutes)
Snack (10 minutes)
Parent Unavailable/ Questionnaires (10 minutes)
Parent Unavailable/ Questionnaires (10 minutes)
Snack (10 minutes)
Block Building (6 minutes)
Imitation Activity (5-15 minutes)
Empathy- Drop Blocks (2 minutes)
Gift (3 minutes)
Gift (3 minutes)

References

Abrams, S.M., Field, T., Scafidi, F., Prodromidis M. (1995). Newborns of depressed mothers. *Infant Mental Health Journal, 16,* 233-239.

Beck, A.T., Steer, R.A., & Brown, G.K. (1996). *Beck Depression Inventory manual (2nd edition).* Psychological Corporation, San Antonio, TX.

Bifulco, A., Moran, P.M., Ball., C., Jacobs, C., Baines, R., Bunn, A., & Cavagin, J. (2002). Childhood adversity, parental vulnerability and disorder: examining inter-generational transmission of risk. *Journal of Child Psychology and Psychiatry, 43,* 1075-1086.

Bornstein, M.H., & Bradley, R.H. (2003). *Socioeconomic Status, Parenting, and Child Development.* Mahwah, NJ: Erlbaum.

Bornstein, M.H., Hahn, C.S., Suwalsky, J.T.D., & Haynes, O.M. (2003). Socioeconomic status, parenting, and child development: the Hollingshead Four-Factor Index of Social Status and the Socioeconomic Index of Occupations. See Bornstein & Bradley, 2003, pp. 29-82.

Bradley, R. H. & Corwyn, R. F. (2002). Socioeconomic status and child development. *Annual Review of Psychology, 53*, 371-399.

Brophy, J.E. (1970). Mothers as teachers of their own preschool children: The influence of socioeconomic status and task structure on teaching specificity. *Child Development, 41,* 79-94.

Burt, K.B., Van Dulmen, M.H.M., Carlivati, J., Egeland, B., Sroufe, L.A., Forman, D.R., Appleyard, K., & Carlson, E.A. (2005). Mediating links between maternal depression and offspring psychopathology: the importance of independent data. *Journal of Child Psychology and Psychiatry, 46,* 490-499.

Brooks-Gunn, J., Klebanov, P., & Liaw, E (1995). The learning, physical, and emotional environment of the home in the context of poverty: The Infant Health and Development Program. *Children and Youth Services Review, 17,* 231-250.

Brown, G.W., & Moran, P.M.(1997). Single mothers, poverty and depression. *Psychological Medicine, 27,* 21–33.

Campbell, P.M., von Stauffenberg, C., Mohan, R., & Kirchner, T. (2007). Trajectories of Maternal Depressive Symptoms, Maternal Sensitivity, and Children's Functioning at School Entry. *Developmental Psychology, 43,* 1202-1215.

Clark, K.E., & Ladd, G.W. (2000). Connectedness and Autonomy-support in Parent-Child Relationships: Links to Children's Socioemotional Orientation and Peer Relationships. *Developmental Psychology, 36,* 485-498.

Cohn, J.F., Campbell, S.B., Matias, R., Hopkins, J. (1990). Face-to-face Interactions of Postpartum Depressed and Nondepressed Mother-Infant Pairs at 2 Months. *Developmental Psychology, 26,* 15-23.

Cohn, J.F., Matias, R., Tronick, E.Z., & Connell, D. (1986). Face-to-face of depressed mothers and their infants. *New Directions for Child Development, 34*, 31-45.

Cohn, J.F., Tronick, E.Z. (1987). Mother-infant face-to-face interaction: The sequence of dyadic states at 3, 6, and 9 months. *Developmental Psychology, 23,* 68-77.

Conger, R. D., Conger, K. J., & Elder, G. (1997). Family economic hardship and adolescent academic performance: Mediating and moderating processes. In G. Duncan & J. Brooks- Gunn (Eds.), *Consequences of growing up poor* (pp. 288-310). New York: Russell Sage Foundation.

Conger, R. D. & Donnellan, M. B. (2007). An interactionist perspective on the socioeconomic context of human development. *Annual Reviews Psychology, 58,* 175-199.

Cox, A.D., Puckering, C., Pound, A., Mills, M. (1987). The impact of maternal depression in young children. *Journal of Child Psychology and Psychiatry, 28,* 917-928.

Downey, G., & Coyne, J. (1990). Children of Depressed Parents: An Integrative Review. *Psychological Bulletin, 108,* 50-76.

Eccles, J., & Harold, R. (1993). Parent-school involvement during the early adolescent years. *Teachers College Record, 94,* 568-587.

Elgar, F.J., Mills, R.S.L., McGrath, P.J., Waschbusch, D.A., & Brownridge, D.A. (2007). Maternal and Paternal Depressive Symptoms and Child Maladjustment: The Mediating Role of Parental Behavior. *Journal of Abnormal Child Psychology, 35,* 943-955.

Emde, R. N., & Buchsbaum, M. (1990). "Didn't you hear me mommy?" Autonomy with connectedness in moral self emergence. In D. Cicchetti & M. Beeghly (Eds.), *The self in transition* (pp. 35-61). Chicago: University of Chicago Press.

Fagot, B.I., & Gauvain, M. (1997). Mother-child problem solving: Continuity through the childhood years. *Developmental Psychology, 33*, 480-488.

Field, T.M., Grizzle, N., Scafidi, F., & Schanberg, S. (1996). Massage and relaxation therapies' effect. *Adolescence, 31,* 903-911.

Field, T., Healy, B., Goldstein, S., & Guthertz, M. (1990). Behavior-State Matching and Synchrony in Mother-Infant Interactions of Nondepressed Versus Depressed Dyads. *Developmental Psychology, 26,* 7-14.

Forman, D.R., Aksan, N., & Kochanska, G. (2004). Toddlers' Responsive Imitation Predicts Preschool-Age Conscience. *Psychological Science, 15,* 699-704.

Forman, D.R., & Kochanska, G. (2001). Viewing Imitation as Child Responsiveness: A Link Between Teaching and Discipline Domains of Socialization. *Developmental Psychology, 37,* 198-206.

Forman, D.R., O'Hara, M.W., Larsen, K., Coy, K.C., Gorman, L., & Stuart, S. (2003). Infant Emotionality: Observational Methods and the Validity of Maternal Reports. *Infancy, 4,* 541-565.

Forman, D.R., O'Hara, M.W., Stuart, S., Gorman, L.L., Larsen, K., & Coy, K.C. (2007). Effective treatment for postpartum depression is not sufficient to improve the developing mother-child relationship. *Development and Psychopathology, 19,* 585-602.

Gauvain, M., Fagot, B.I., Leve, C., & Kavanagh, K. (2002). Instruction by mothers and fathers during problem solving with their young children. *Journal of Family Psychology, 16,* 81-90.

Goldsmith, D.F., & Rogoff, B. (1995). Sensitivity and Teaching by Dysphoric and Nondysphoric Women in Structured Versus Unstructured Situations. *Developmental Psychology, 31,* 388-394.

Goldsmith, D.F., & Rogoff, B. (1997). Mothers' and Toddlers' Coordinated Joint Focus of Attention: Variations With Maternal Dysphoric Symptoms. *Developmental Psychology, 33,* 113-119.

Goodman, S.H., Brumley, H.E. (1990). Schizophrenic and depressed mothers: Relational deficits in parenting. *Developmental Psychology, 26,* 31-39.

Goodman, S., & Gotlib, I. (1999). Risk for psychopathology in the children of depressed mothers: A developmental model for understanding mechanisms of transmission. *Psychological Review, 106,* 458-490.

Goodman, S., & Gotlib, I. (2001). *Children of depressed parents: Mechanisms of risk and implications for treatment.* APA: Washington.

Gosselin, M.P.M & Forman, D. R. (in preparation). The Quality of Attention-Seeking Behaviors as a Mediator of Caregiver's Responsiveness and Child Eagerness to Learn: Implications for Expectations of Responsiveness.

Grolnick, W.S., Gurland, S.T., DeCourcey, W., & Jacob, K. (2002). Antecedents and Consequences of Mothers' Autonomy Support: An Experimental Investigation. *Developmental Psychology, 38,* 143-155.

Gross, D., Conrad, B., Fogg, L., & Willis, L. (1995). A longitudinal study of maternal depression and preschool children's mental health. *Nursing Research, 44,* 96-101.

Hess, R.D., & Shipman, V.C. (1965). Early experience and the socialization of cognitive modes in children. *Child Development, 36,* 869-885.

Hess, R. & Holloway, S. (1984). Family and school as educational institutions. In R, D. Parke (Ed.), *Review of child development research* (pp. 179-222). Chicago: University of Chicago Press.

Huston, A., McLoyd, V. C., & Garcia Coil, C. (1997). Poverty and behavior: The case for multiple methods and levels of analysis. *Developmental Review, 17,* 376-393.

Johnson, J.G., Cohen, P., Kasen, S., Smailes, E., & Brook, J.S. (2001). Association of Maladaptive Parental Behavior With Psychiatric Disorder Among Parents and Their Offspring. *Archives of General Psychiatry,58*, 453-460.

Joussemet, M., Koestner, R., Lekes, N., & Landry, R. (2005). A longitudinal study of the relations of maternal autonomy support to children's adjustment and achievement in school. *Journal of Personality, 73 (5)* 1215-1236.

Kandler, L., Gosselin, M. P. M., & Forman, D. R. (2008, March). *Parental responsiveness Relating to Toddlers' Eagerness to Learn and Attention-seeking Behaviors.* Poster presented at the Biennial International Conference on Infant Studies, Vancouver, BC.

Kaye, K., & Fogel, A. (1980). The temporal structure of face-to-face communication between mothers and infants. *Developmental Psychology, 16,* 454-464.

Kendler, K.S., Myers, J., & Prescott, C.A. (2000). Parenting and adult mood, anxiety and substance use disorders in female twins: An epidemiological multi-informant, retrospective study. *Psychological Medicine, 30,* 281-294.

Kochanska, G., Forman, D.R., & Coy, K.C. (1999). Implications of the mother-child relationship in infancy socialization in the second year of life. *Infant Behavior and Development, 22,* 249-265.

Lee, V., & Croninger, R. (1994). The relative importance of home and school in the development of literacy skills for middle-grade students. *American Journal of Education, 102,* 286- 329.

Lorant, V., Deliège, D., Eaton, W., Robert, A., Philippot, P., & Ansseau, M. (2003). Socioeconomic inequalities in depression : a meta-analysis. *American Journal of Epidemiology, 157,* 98-112.

Lundy, B.L., Jones, N.A., Field, T., Nearing, G., Davalos, M., Pietro, P.A., Schanberg, S., & Kuhn, C. (1999). Prenatal depression effects on neonates. *Infant Behavior & Development, 22,* 119-129.

Maccoby, E. E., & Martin, J. A. (1983). Socialization in the context of the family: Parent-child interaction. In E. M. Heatherington (Ed.), *Manual of child psychology, vol.4, Socialization, personality and social development* (pp1-101). New York: Wiley.

Malatesta, C.Z., & Haviland, J.M. (1982). Learning Display Rules: The Socialization of Emotional Expression in Infancy. *Child Development, 53,* 991-1003.

Malik, N.M., Boris, N.W., Heller, S.S., Harden, B.J., Squires, J., Chazan-Cohen, R., Beeber, L.S., Kaczynski, K.J. (2007). Risk for Maternal Depression and Child Aggression in Early Head Start Families: A Test of Ecological Models. *Infant Mental Health Journal, 28,* 171-191.

Murray, L., Fiori Cowley, A., Hooper, R., & Cooper, P. (1996). The impact of postnatal depression and associated adversity on early mother-infant interactions and later infant outcomes. *Child Development, 67,* 2512-2526.

Parker, G., Tupling, H., & Brown, L.B. (1979). A parental bonding instrument. *British Journal of Medical Psychology, 52,* 1-10.

Pratt, M.W., Kerig, P., Cowan, P.A., & Cowan, C.P. (1988). Mothers and fathers teaching 3-year-olds: authoritative parenting and adult scaffolding of young children's learning. *Developmental Psychology, 6,* 832-839.

Putnam, S. P., Gartstein, M. A., & Rothbart, M. K. (2006). Measurement of fine-grained aspects of toddler temperament: The Early Childhood Behavior Questionnaire. *Infant Behavior and Development, 29*, 386-401.

Ryan, R.M., & Solky, J.A. (1996). What is supportive about social support? In G. Pierce, B. Sarason, & I. Sarason (Eds.), *Handbook of social support and the family* (pp. 249-259). New York: Plenum Press.

Sameroff, A.J., Seifer, R., & Zax, M. (1982). Early development of children at risk for emotional disorder. *Monographs of the Society for Research in Child Development, 47,* 82.

Silberg, J., & Rutter, M. (2001). Nature-Nurture Interplay in the Risks Associated With Parental Depression. In Goodman, S.H., & Gotlib, I.H. (Eds.) *Children of Depressed Parents: Mechanisms of Risk and Implications for Treatment* (pp. 13-36). Washington: American Psychological Association.

Suchman, N.E., Rounsaville, B., DeCoste, C., & Luthar, S. (2007). Parental control, parental warmth, and psychosocial adjustment in a sample of substance-abusing

mothers and their school-aged and adolescent children. *Journal of substance-abuse treatment, 32*, 1-10.

Stipek, D. J., & Ryan, R. H. (1997). Economically disadvantaged preschoolers: Ready to learn but further to go. *Developmental Psychology, 33*(4), 711-723.

Tamis-LeMonda, C.S., Shannon, J.D., Cabrera, N.J., & Lamb, M.E. (2004). Fathers and Mothers at Play With Their 2- and 3-Year-Olds: Contributions to Language and Cognitive Development. *Child Development*, *75*, 1806-1820.

Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes. In M. Cole, V. John-Steiner, S. Scribner, & E. Souberman (Eds.), Cambridge, MA: Harvard University Press.

Wilfong, E.W., Conway, S., Elksnin, N. (1991). Influences on Responsiveness: Interactions Between Mothers and Their Premature Infants. *Infant Mental Health Journal, 12,* 31-40.

Williamson, P.A., & Silvern, S.B. (1986). Parental Teaching Styles in an Open-ended Teaching-Learning Environment. *Early Childhood Research Quaterly, 1,* 407-415.

Wood, D., Bruner, J.S, & Ross, G. (1976). The role of tutoring in problem solving. *Journal of Child Psychology and Psychiatry, 17,* 89-100.

Zahn-Waxler, C., Cummings, E.M., Ianotti, R.J., Radke-Yarrow, M. (1984). Young offspring of depressed parents: A population at risk for affective problems. *New Directions for Child Development, 26,* 81-105.

Appendix A

Recruitment Poster

EAGER TO LEARN

What makes a two-year-old eager to learn? Help us find out by volunteering for a child development study.

Your participation will involve:

Coming to our lab at Concordia University; participating in activities with your two-year-old child, including activities where your child will imitate you, and activities designed to mirror daily life.

Does this sound interesting?

Contact Julie or Sarah at the Concordia Collaboration Laboratory

Social Responsiveness and Imitation Study.
Phone: (514) 848-2424 ext. 5286
Email: collab@alcor.concordia.ca

The Concordia Collaboration Laboratory
is directed by David R. Forman, Ph. D.,CRDH, ConcordiaUniveristy Psychology Department

Appendix B

Information Sheet and Consent Form

Children's Social Responsiveness and Imitation

Directed by David Forman, Associate Professor
Concordia University

Dear parents,

David Forman, Ph.D., and his assistants Julie Laurin, Marie-Pierre Gosselin, and Sarah Vannier are conducting a study to learn more about children's social responsiveness and imitation.

It is well understood that imitation plays a vital role in children's learning of both cognitive skills and rules for conduct. This work will deepen our understanding of children's eagerness to learn through imitation. It could also potentially inform our understanding of teaching and learning processes, and of child social responsiveness more generally. We would like to include you and your child in this project because your child is at the age targeted for this study.

Your participation would consist of:

- Bringing your child to the Concordia University for two visits, approximately one to two weeks apart. During both of these sessions, you and your child will engage in a variety of activities.

****The sessions will last approximately 1 hour to 1 hour and 20 minutes each. The sessions will be videotaped to record the child's interactions with you and with the experimenter.*

- Demonstrating a set of actions for your child to imitate, and doing a simple building task with your child.

**** These exercises are designed to observe the development of children's eagerness to learn.*

- Showing your child a set of toys that are prohibited, or "off-limits." In a different situation, your child will also be asked to help clean up after playing with toys.

****These exercises are designed to observe the development of children's responsiveness to parents' rules.*

- Taking part in activities designed to mirror daily life. These include having a snack, playing together, and your filling out questionnaires while your child occupies himself or herself. The questionnaires ask about your child's temperament and about your current well-being.

**** This exercise is aimed to see how routine interactions with parents, including children's reactions when mother is busy, relate to children's responsiveness*

****As a token of our thanks, your child will receive a small toy at the end of each session. In addition, upon completion of the study, you will receive a gift certificate.*

Advantages to participate

With the exception of these small thank you gifts, participation in the study will provide no direct benefit to you or to your child. You should be aware that the researcher's work is designed to answer some very basic questions about early social development. Therefore what researchers are doing should not be perceived as therapy,

nor will it benefit you and your child directly. Rather, the greater benefit will be to children at large.

Withdrawal from the Study

You may withdraw from participation at any time, without prejudice to your current or future relations with Concordia University. In addition, we encourage you to end any activity immediately if you think your child may be too tired or too frustrated to continue.

Confidentiality and Anonymity

As mentioned above, these sessions will be videotaped. The tapes will be used for research and/or educational purposes, and you and your child will be identified by first name and age only. All documents containing information identifying your child or yourself will remain in a locked file in the office of the coordinators (Consent forms, etc). The tapes will be retained for seven years from the completion of the study or from publication of the results, whichever occurs later. Your name and your child's name will be withheld from all published reports of this work.

When the study is complete the researchers plan to send you a brief summary of their findings. Until then, if you have any questions, feel free to contact the investigators of the study.

Marie-Pierre Gosselin
Research Coordinators
collab@alcor.concordia.ca
Tel: (514) 848-2424, x 5286

David Forman, Ph.D.
Associate Professor
Center for Human Development
Department of Psychology
Concordia University
7141, Rue Sherbrooke West
Montreal, Qc, H4B 1R6
Tel: (514) 848-2424, x 2248
Fax: (514) 848-2815
david.forman@concordia.ca

If at any time you have questions about your rights as a research participant, please contact Adela Reid, Research Ethics and Compliance Officer, Concordia University, at (514) 848-7481 or by email at areid@alcor.concordia.ca

PARENTAL CONSENT FOR RESEARCH PARTICIPATION

Title: Children's Social Responsiveness and Imitation

Responsible Researcher: David Forman, Ph.D, Associate Professor, Concordia University

I understand and agree to take part in a psychology study. I understand that this study's purpose is to learn more about the development of children's eagerness to learn through imitation, and their social responsiveness more generally.

I consent to the following procedures:

- *Bringing my child to the Concordia University for two visits, approximately one to two weeks apart.*
- *Demonstrating a set of actions for my child to imitate, and doing a simple block building task with my child.*
- *Showing my child a set of toys that are prohibited, or "off-limits" and asking my child for some help cleaning up after playing with toys.*
- *Taking part in activities designed to mirror daily life. These include having a snack, playing together, and filling out questionnaires while my child occupies himself or herself.*

I understand that all information given regarding my child or myself will remain **strictly confidential**.

I understand that my participation and my child's participation in this research is totally voluntary and that I can withdraw from participation at any time, without prejudice to my current or future relations with Concordia University.

I consent to be contacted in the future by telephone regarding participation in optional additional studies. Yes (phone number:_____) No

I _____ agree to participate in Dr. Forman's study.

Signature of Participant _____ Date _____

I also grant permission for my child _____ to participate in Dr. Forman's study. I will be given a copy of this consent form for my records.

Signature of Parent or Guardian _____Date _____

Team Member
Signature of Researcher_____ Date _____

If at any time you have questions about your rights as a research participant, please contact Adela Reid, Research Ethics and Compliance Officer, Concordia University, at (514) 848-7481 or by email at areid@alcor.concordia.ca.

Appendix C

Demographics Questionnaires

SRID _____

Your Name: _____

Your Child's Name: _____

Demographic information

1. Child's Gender (circle one): Female Male

2. Child's Birthday: ____ / ____ / _____ (dd/mm/yyyy)

3. Relationship to child: Mother____ Father____ other primary caregiver (describe) _____

4a. Your ethnicity (circle one)
Hispanic or Latino Not Hispanic or Latino

4b. Your race (more than one may be circled)

First Nations Asian

White or Caucasian Black or African American

Do not wish to disclose Mixed or Other (please describe) _____

5. Your child's race and ethnicity, if different than yours: _____

6.Your highest level of completed education (please circle one)

Not finished High School Undergraduate University Degree

High School/ G.E.D. Graduate University Degree

College/ Technical Training

7. Your current marital status (please circle one)

Never Married Married Cohabiting

Separated Divorced Widowed

8. Your current employment status (please circle one)

Homemaker	Working full-time
Working part-time	Retired

9. Total family income (please circle one)

$0 - $25,000 $25,000-$50,000 $50,000 - $75,000 $75,000 - $100,000 > $100,000

10. How many hours per week is your child in daycare or other out-of-home care?

less than 5 _____ between 5 and 20 _____ more than 20 _____

SRID _____

Your Name: _____

Your Child's Name: _____

Demographic information – Wave 2

1. Your (Parent) Birthdate: ____ / ____ / _____ (dd/mm/yyyy)

2. Your relationship to the child: Mother Father Other: _____

3. Are there other children living in your household? Yes / No

If yes please tell us more about them:

A. Gender: Female/ Male Birthdate ____ / ____ / _____ (dd/mm/yyyy)

B. Gender: Female/ Male Birthdate ____ / ____ / _____ (dd/mm/yyyy)

C. Gender: Female/ Male Birthdate ____ / ____ / _____ (dd/mm/yyyy)

D. Gender: Female/ Male Birthdate ____ / ____ / _____ (dd/mm/yyyy)

E. Gender: Female/ Male Birthdate ____ / ____ / _____ (dd/mm/yyyy)

F. Gender: Female/ Male Birthdate ____ / ____ / _____ (dd/mm/yyyy)

4a. Your current marital status (please circle one)

Cohabiting Married Single

Separated Divorced Widowed

4b. Has your marital status changed in the past 18 months? Yes / No

4c. If yes, please describe how: _____

5. Your current employment status (please circle one)

Homemaker	Working full-time	Maternity / Family Leave
Working part-time	Retired	Other: _____

6. Total family income (please circle one)

$0 - $25,000 $25,000-$50,000 $50,000 - $75,000 $75,000 - $100,000 > $100,000

7. How many hours per week is your child in daycare or other out-of-home care?

less than 5 _____ between 5 and 20 _____ more than 20 _____

8. Is your child exposed to a second (or third) language for 20 hours per week or more?

[examples: speaks French at home and English at the daycare for 20 hours or more per week. Or, spends 20 hours or more per week with a grandparent or babysitter that speak a different language. Or, each parent consistently uses a different language with the child.] (please circle one)

Yes No

9. Which best describes your child's ability to speak a second language? (choose 1)

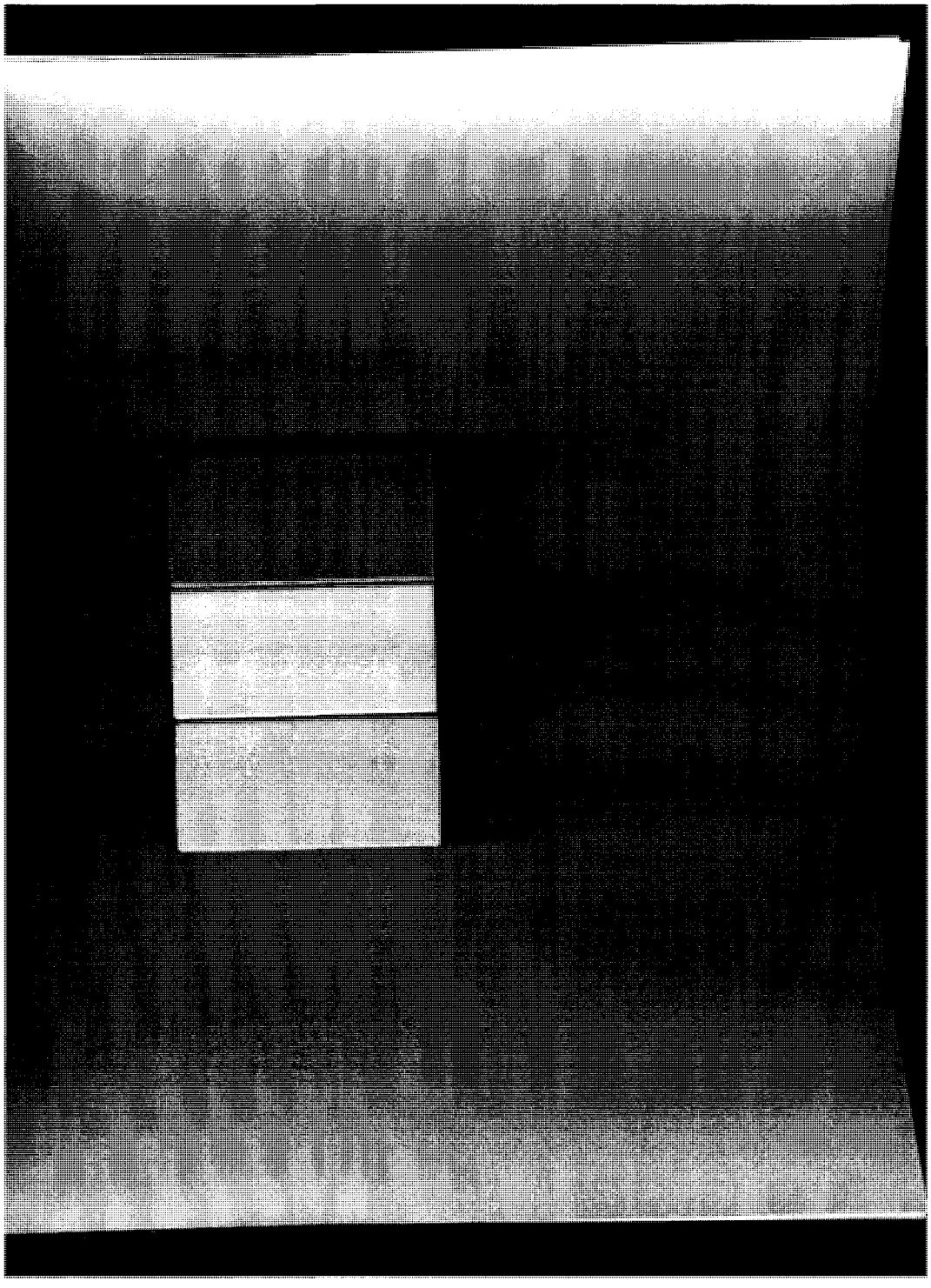
Note: if your child is learning three languages, pick their best two in order to answer this question

1	2	3	4
Child speaks only one language	Child knows a few words or songs in a second language but usually speaks in one	Child speaks two languages but is clearly better at one or clearly likes one more than the other	Child is equally good at speaking two languages and uses both as needed

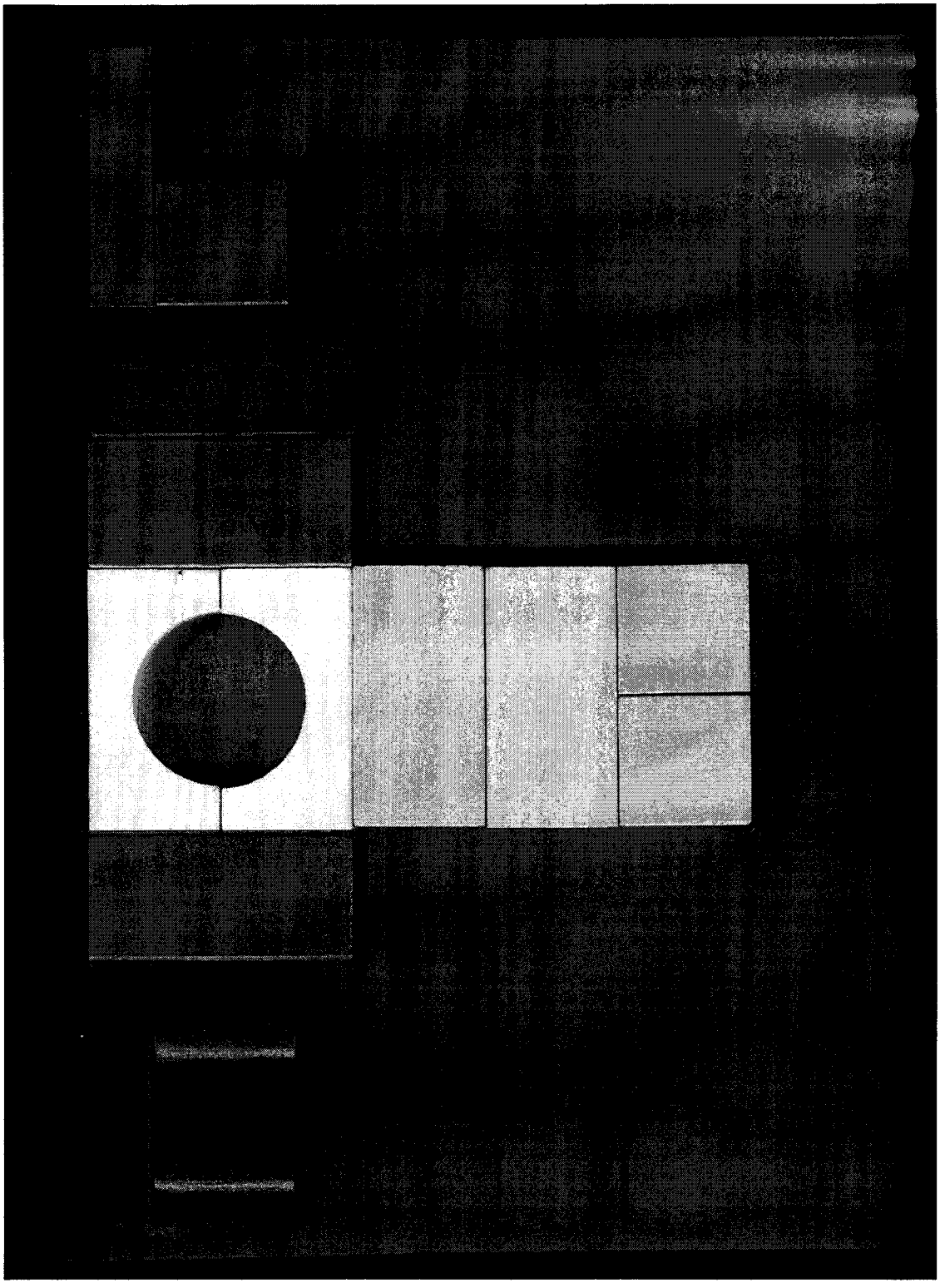
Appendix D

Block-Building Pictures

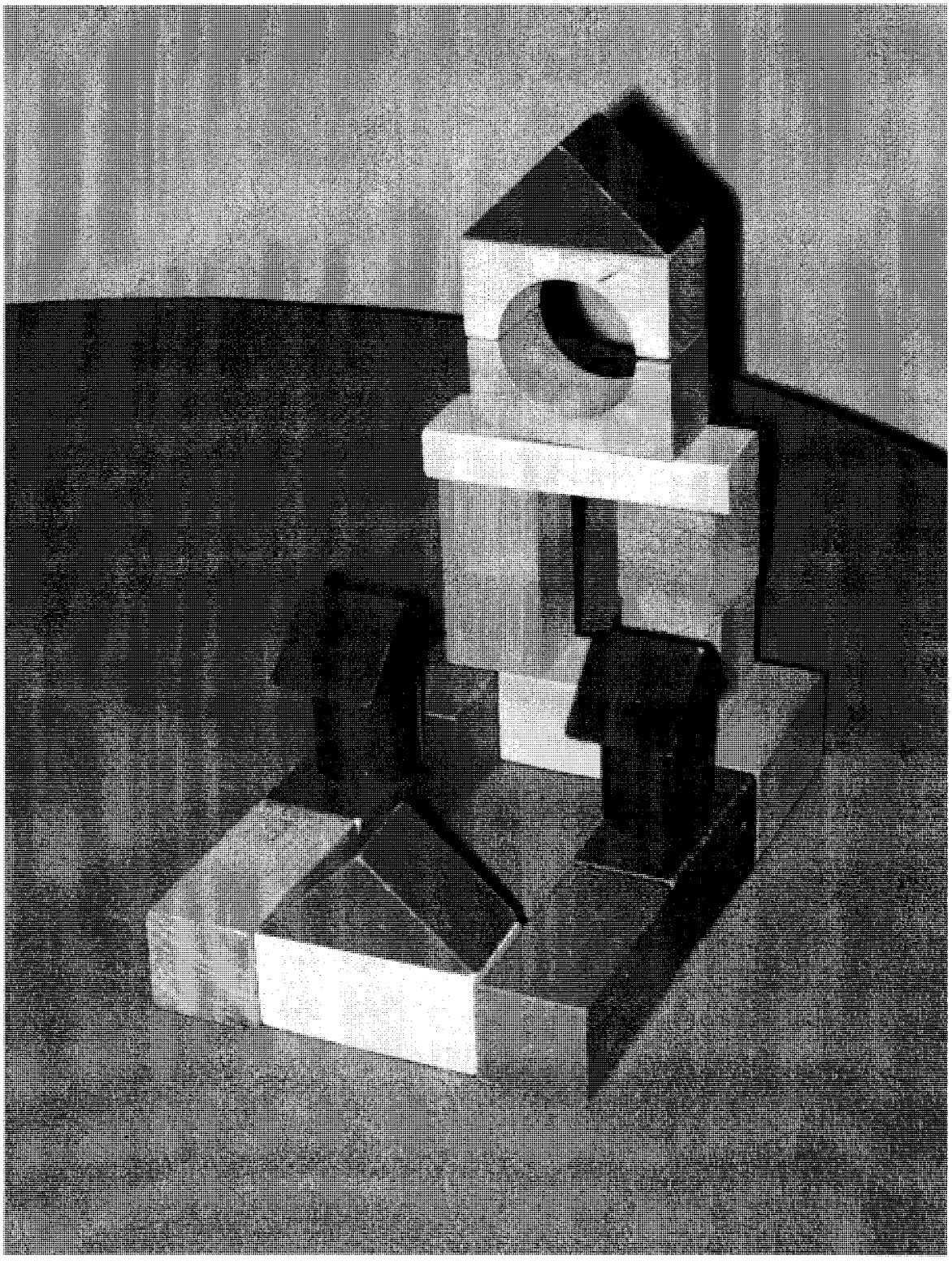
Easy block-building task (Wave 1)



Hard block-building task (Wave 1)/ Easy block-building task (Wave 2)



Hard block-building task (Wave 2)



Appendix E

Coding System for Amount of Information

CODING SYSTEM FOR PARENTAL TEACHING IN BLOCK BUILDING TASK

Definition: Parental teaching refers to the parents' speech or behaviour that can facilitate their children's understanding or completion of the required task, or that provides general information/knowledge, which may or may not directly relate to the required task.

1. TASK INFORMATION

The coding for parent teaching during the block building task lasts for 5 minutes in both Sessions 1 and 2. Session 1 is a structured building task, whereas session 2 in unstructured, hence, the task information is different in this regard. The criterion to define the relevant information is slightly different. Examples:

1) In session 1, when the parent is pointing at the picture and says 'Let's build this' it is coded as a strategy. However, in session 2, when the mother puts a block on an existing structure and says 'Look at this', it is coded as a simple.

The coding only begins at the end of the experimenter's phrase, "I will be back in 5 minutes". Each interval of 10 seconds is observed for the quality and type of information that the parent provides for the block building task. The coding ends at the last complete 10-sec interval.

Do not code anything that does not provide specific information about the task, such as:

- Any general prompts to do the task. "*Let's build this*"
- Any motivational feedback. "*You're doing great*"
- Any physical form of distraction. (Parent starts shaking his/her leg)

Questions asked by the parents are considered weaker versions of actual statements. Even if they do not directly provide information about the task, they make the child think about the task. Any information that is provided in the form of questions should be first translated into statements and then assigned to appropriate categories. It is important to note that only specific questions are coded, not the open-ended ones. Open-ended questions are too general. For example, if the mother says 'Do you want to put this somewhere?' it is coded as a simple (not a complex) because 'this' is a what (simple), but 'somewhere' is too general to be coded.

Code Specific, Close-Ended Questions:

"*Do you want the blue one?*" → "*Have the blue one*"

"*Do you want to put it here?*" → "*Put it here*"

"*Should we turn it?*" → "*Turn it*"

"*Do you want to build a castle?*" → "*Let's build a castle*"

Do Not Code General Questions:

"*What do you want to do next?*"

TASK INFORMATION PROVIDING VARIABLES

For each interval the coders observe six different variables: *Uninformative, Simple, Complex, Property/Strategy, Modality* and *Appropriateness of Timing.*

1. **Uninformative**: Verbal information that is irrelevant to the task and might distract the child from doing the block building task at hand. It does not provide

any information about the task. Also include unintelligible, inappropriate, verbalizations. Only include if the distraction is initiated by the parent or if the parent encourages child's off-task behaviour.

"*Let's go to McDonald's after this*"

"*La la la*"

Child points at the picture of the cat on the wall, and the parent says, "*Yeah that's a cat like your friend Michael has*"

2. **Labelling/Color:** This category refers to parental speech or behavior that serves to label objects (e.g. "*That's a table.*" ; "*Look, this is a picture.*") or colors ("*What color is this?*"; "*This is blue.*"). This is considered to be things the child should already know by age 2 and it thus considered too low-level to be coded in another category (such as strategy or simple).

3. **Simple**: Only one aspect of the task is covered (What, Where, or How?)

Statements	Questions
"*Take the blue block*"	"*Do you want the blue one*"
"*Put on top*"	"*Do you want to put on top?*"
"*Turn*"	"*Should we turn?*"
'Put something here/on top"	'Can you put a block here?'

4. **Complex**: More than one aspect of the task is covered (What/Where, What/How, Where/How, or What/Where/How?)

Statements	Questions
"*Put the blue block there*"	"*Do you want the blue one there?*"
"*Slide the red block*"	"*Should we slide the red block?*"
"*Turn it on top*"	"*Should we turn it on top now?*"
"*Slide the green block next to the red one*"	"*Should we slide the blue one next to the red one?*"

5. **Property/Strategy**: Explicitly providing reason to do something (Why?) or not to do something. It might also include refining simple information. It explains how a property of the block is related to the goal of the activity, i.e. building. The parent can clean the area they are working in or help the child put a block somewhere so it does not fall. Do not code if the parent fixes a block for the child after it is in place, only code if the parent fixes the block while the child is still struggling with it. It also includes the description of the blocks' shape, as this can help the child fit them together. However, it des not include the labelling of colors as this is coded in 'Labelling/Color'. In session 1, a demonstration is considered a strategy unless in the form of directives. In the latter case, it would be considered simple or complex, depending on the amount of information provided. Ex. 'Let's do this this this", just showing, not asking the child to repeat it = strategy. For it to be simple or complex

   Statements

   "*Put the long sides together*" alone would a Simple (How)

   "*Put the long sides together, they will fit*" is a strategy because it explains why

"*You turned it this way but it needs to be flat*"

"*If you take this one it will not fall*"

"*Let's build this*" and pointing at the picture

"*Take this blue one*" followed by "*It's not going to fall*" in the same interval would be coded as a simple + a strategy.

"See how these are different colours"

Do not code something that is too low level ("*No, not this one*")

Questions

"Is this the same colour as on the picture?"

"*Do you think it will fall if you put it on top?*"

"*Doesn't this look like a train?*"

"*Does this look finished like in the picture?*" (Discussing if the task is complete or not)

6. **Modality**: Information provided could either be only verbal or only physical (Unimodal), or both verbal and physical (Bimodal). The physical modality includes pointing, showing, and handing.

   "*Take the blue one*" without doing any physical actions

   Handing the blue one without saying anything

   "*Take the blue one*" and also handing the blue one is Bimodal

   "*Take this one"* is considered Bimodal if the parent also shows it to the child

"Here" and the parent gives the block to child is considered Unimodal (the verbal information is not sufficient)

Weight for each category of information:

According to the complexity and quality of the information provided by parents, weights will be given to each category to compute the scores.

0: Uninformative

1: Simple

1.5: Property/Strategy

2: Complex

1: Unimodal

2: Bimodal

General notes:

- If in an interval there are two Simple, one unimodal and the other bimodal, only Bimodal Simple is coded
- If two utterances are the same (e.g. Simple Bimodal), and one is Inappropriate and the other is Appropriate, then only Inappropriate is coded. Inappropriate utterances are rare and hence, should be coded when observed.
- If the segment is heard thrice and something is still not clear, then it should not be coded
- If the parent is building on their own and not making obvious attempts to communicate with the child, then their demonstration is not coded

- If a part of a complex prompt is in one modality and part in the other, then break it down as follows: "*Take this block* (and handing it)*, and slide it next to the green one* (not pointing)"

(Simple Bimodal) (Complex Unimodal)

Appendix F

Coding System for Motivational Support

Coding System for Parental Motivational/Emotional Support

Definition: motivational/emotional support refers to the parent's behavior that facilitates the recruitment and maintenance of the child's attention to (or interest in) the required task and the motive of the child to pursue the end goal. It also includes emotional support, such as parent's sensitivity to child's affect, praising the child, or showing empathy for the child's distress, etc.

This coding system can be used in structured (e.g., block building, imitation, etc) and non-structured contexts (e.g., free play). For block building task (duration: 5 minutes), coding interval is 30 seconds. The first segment starts exactly at the time when the experimenter finishes her instruction.

The differentiation of motivational and emotional support is according to Maslin-Cole et al. (1993). However, because, conceptually, emotional support is always a component of motivational support, the final motivational support should be an aggregate of both the *motivational* and *emotional support*.

Three aspects of positivity or positive affect will be examined in this coding system. In addition, we will be looking at two aspects of autonomy support.

Emotional Support

The three aspects of parent's emotional support will be coded on a scale of 1 to 5.

Balance of positive vs negative feedback: This is a balance of how much positive vs negative feedback the parent is providing the child while building. It is important to be careful because two very similar sentences can be very different in terms of the type of feedback they are providing.

Example of negative feedback:

'No, you can't put this one there."

Note: Negative feedback may be softened ("No, sweetheart") or combined with suggestions ("That doesn't fit. Try here"). These should be considered somewhat negative, or code 2.

Example of mixed feedback:

"Yes, that's the blue one but it doesn't go there."

Examples of positive feedback:

"Good." "Yes, that's right."

1= Very negative: The parent provides only negative feedback, and this is not softened in any way.

2= Somewhat negative: The parent provides more negative than positive feedback, or provides only one or two instances of negative feedback, softened as described above.

3= Neutral/Balanced: The parent provides an equal amount of positive and negative feedback. NOTE. If there is no performance feedback do not code 3, but N.A.

4= Somewhat positive: The parent provides more positive than negative feedback, or only one instance of positive feedback.

5= Very positive: At least two instance of positive feedback, with no negative feedback.

Enthusiasm: This scale refers to the level of interest the parent shows in the child's performance (note: not in the task per se. Enthusiasm must be communicated to the child. Fascination with the blocks themselves is not sufficient). Again, this is coded from 1-5, based on the extent to which the parent is a 'cheerleader' for the child in completing the task. An enthusiast parent is engaged in the task, has high levels of positive energy and is upbeat. This code is given at all times (there can be no N/A).

1= Withdrawn: The parent shows barely if any interest in the child's doing the task. The parent is simply watching the child, or can be doing something else (looking in the mirrors, at the cat on the poster, etc.). This is also the code to use when the parent is building on her own and does not show interest in helping the child achieve the task.

2= Somewhat withdrawn: The parent has some extended period in which they do not show much interest in helping the child complete the task. The parent may show some interest on brief occasions, but has clearly checks out on others. Or the parent is otherwise a three, but when the child expresses enthusiasm, the parent noticably fails to match it. This code is given when the parent does not show much interest in having the child do the task. It is also the code to use when the parent is building with the child for half an interval, and building on her own the rest of the time.

3=Average: The parent shows consistent interest in the activity, but no real enthusiasm or excitement. There is some interest, but nothing more than that.

4= Somewhat enthusiastic: The parent is interested throughout, and shows one or more instances of real enthusiasm, but it is brief.

5= Enthusiastic: The parent clearly communicates enthusiasm, delight, or excitement about doing the task with the child.

Warmth: Refers to how much the parent approves of what the child is doing, and to how much soothing, love, and sympathy the parent is providing to the child. The opposite of warmth is 'Hostility', which we describe as displays of coldness, sarcasm, resentment, and in instances where the parent is putting down the child.

1= Hostile: The parent at least once displays clear sarcasm, coldness, resentment, and/or is putting down the child, and the parent rarely shows any warmth.

2= Somewhat hostile: The parent shows some hostility (sarcasm, coldness, resentment), but is also warm at other times. Or the parent appears to be displeased with the child (for example watching with a slight frown), but there is no marked behavior that can be clearly pointed to.

3= Neutral: The parent does not show marked warmth or hostility, or shows mild warmth and even fainter hostility.

4= Somewhat warm: The parent shows positive signs of warmth towards the child These may include soothing or loving vocal tone, sympathy, frustration control, or genuine pride.

5= Warm: The parent is very warm with the child (i.e provides notable or extensive soothing, love, sympathy, and frustration control, or pride) most of the time and displays very little neutral and no hostile behaviours.

Autonomy Support

Autonomy Support is broadly defined as parental speech or behavior that encourage the child to do the task by his/herself, such as "you can do it", "you do it". Some parents' questions also can be coded as autonomy support, such as "what do you think?", "do you think we can put it here?" etc. Another part of autonomy support is the provision, by the parent, of time and space for the child to work on his/her own. Again, this will be coded on rating scales from 1 to 5, in 30-seconds intervals.

This coding system will focus on two aspects of autonomy support:

Autonomy Promotive Suggestions vs Demands, This is based on verbal behavior, stemming from the idea that an autonomy supportive parent will tend to give more suggestions than demands, therefore leaving place for the child to execute the task in the way he/she thinks it is appropriate. The coder needs to pay extra attention at the way sentences are formulated. The same information can be delivered in ways that are almost exactly the same, but that need to be coded differently. For example: 'Put this one there' vs 'How about we put this one there?' Note: A demand with an explanation carries the same same promotive value as a suggestion. "Put it there because then it will look like the picture". General prompts (e.g. Let's build something) are not considered as suggestions or demands as they are too general. We code only specific task-related demands, suggestions and open-ended questions.

1= Demanding: The parent makes only demands to the child. These are not softened or mitigated in any way. Examples of demands: 'Put this one there.' 'Take the blue one.'

2= Somewhat demanding: The parent either makes more direct demands than suggestions, or makes only demands, but softens at least one. Examples of softening: "Put it there, hon" or "Put it there, ok?" It also includes what could have been coded as Neutral/Balanced: The parent makes an equal number of suggestions and demands.

3=Somewhat suggestive: The parent provides more suggestions than demands. Or the parent makes a single suggestion and no other statements about the child's activity.

4=Suggestive: The parent provides only suggestions and open-ended questions, or reflections on the child's ongoing activity. For example: 'Would you like to put this one here?'; 'How about this one'; 'Maybe we can put it here.' (all suggestions). "Now what where would you like to put it?" (open-ended question) "Are you going to use the green one now" (after the child already has the green one—reflection)

5= Only open-ended questions or reflections on the child's ongoing activity

N/A do not code = the parent make no verbal comment about what the child is doing, ought to do, or might want to do.

Parent- vs child-driven: or Intrusiveness vs Autonomy Support.

Intrusiveness is equal to inappropriate control on behalf of the parent, in order to take charge of the task. It is only coded when on task, and intrusiveness should be coded everytime it is seen.

1=Intrusive: The parent does not let the child attempt the task, or at least once physically removes a block from the child's hands.

2= Somewhat intrusive: The parent does not give much opportunity for the child to attempt the task, or the parent gives a brief opportunity for the child to build, and ends up taking control of the task very shortly after.

3= Shared: The parent and the child equally contribute towards achieving the task. The parent does leave some room for the child, but will also build.

4= Somewhat child-driven: The parents mostly leaves the child achieve the task, but will provide some help without being needed or asked by the child.

5= Autonomy supportive: The parent lets the child attempt the task by him/herself, and only provides help when the child is not able to pursue on the task without that help. The parent is watching the child, and is attentive for cues that the child needs help.

Attention Recruitment

Off-task structure is the amount of structure or guidance the parent provides when the child goes off-task. It is only coded when there's a substantial proportion of the interval that is spent off task (i.e. more than 5 seconds)

1= No Structure: allows child to be off-task without any attempt to bring the child back to the task

2= Some structure: Parent waits a long time before providing any guidance or structure to bring the child back to the task. It's very low in energy, intensity and it is not compelling.

3= Structure: Parent provides clear and instant prompts and information to the child as soon as possible.

Appendix G

Coding System for Motivation to Learn

Coding System: Child Responsiveness and Eagerness to Learn

Introduction

The coding of the child motivation and eagerness to learn takes place during the build activity, which lasts 5 minutes. The build task starts when the experimenter says, "I'll be back in five minutes." Child motivation and eagerness to learn is coded in 30 second intervals beginning when the experimenter says min. No more than 10 intervals are to be coded. Since the parent is setting up and explaining the activity during the first interval, child motivation and eagerness to learn will be based more heavily on attentiveness to instructions rather than behaviour.

In coding child motivation and eagerness to learn, there are several key components of child behaviour that should be examined:

- Posture/orientation.
- Verbal communication with the parent (e.g. expressing ideas, asking questions, etc.).
- Child actions (important to consider when child actions do not equal verbal communication, e.g. saying "no" but following instructions).
- Child affect.
- Sharing and collaborating with the parent (e.g. eye contact, negotiating, etc.).
- Imitation (e.g. repeating what the parent's instructions, pointing to the same block, etc.).
- Eagerness (in the form of enthusiasm or fascination).
- Child behaviour modifications in response to parent's instructions/prompts.

NOTE: Lack of accuracy in child performance (e.g. puts block on wrong side) does not equal defiance or passivity towards parent's instructions, instead this is considered positively as a modification of behaviour. The same is true for when a child performs well on the build task. Performing well does not equal eagerness to learn, because eagerness to learn depends on communication and collaboration with the parent as well as interest in the task.

For each interval, coders must give a motivation code using the following 4-point scale. Coders must select the code that is most appropriate to the motivation of the child. Note that the following descriptions are guidelines and that coding each interval requires an overall judgment of the child motivation. Thus, although the child may not demonstrate a constant and equal level of motivation throughout a given interval, coders must use the code that is the closest approximation of the overall quality of the child motivation to learn from, and with the parent for that interval. Overall motivation and eagerness to learn should be based on child interest in the task as well as social interactions with the parent, both components being equally important.

Global Ratings

0 = The child is clearly not eager to learn from the parent. The child does not want to cooperate and share with the parent. The child may walk away or run around the room and does not get involved with the ongoing activity.

- The child takes the picture or walks away from the parent.

- The child competes with the parent instead of cooperating.

- Overall motivation and eagerness to learn is poor or bad.

1 = The child is partially involved with the imitation activity but she focuses mostly on the object. His/her motivation to share with the parent is fair, but not good. The child is not really looking at the parent nor is he/she very involved in the learning process. The child may show impatience and/or may ignore the parent's instructions and guidance.

- The child may be doing the activity but there is no structure to their actions or consideration for parent's suggestions.

- The child exhibits low interest in learning from the parent.

- If the child loses interest in the task and parent's attempts to return the child's focus are unsuccessful, code 1 even if the child is still interested in the parent.

- If the parent does not provide instructions in a given interval, code 1 if the general feeling of the interval is negative.

2 = Child overall motivation to share and collaborate with parent is good, but not great. The child is attentive but is mostly oriented toward the task and not so much with the parent or vice versa. The child is somewhat responsive to mom, but lack shared enthusiasm of a code 3. - The child exhibits a number of key components but not all of them.

- If the child loses interest in the task but the parent does not attempt to return the child's focus, instead a new learning task is shared code 2.
- If the parent does not provide instructions in a given interval, code 2 if the general feeling of the interval is positive.

3 = The child is clearly eager to learn from parent. There is a "spark" that seems to occur between the parent and the child. The parent and the child share enjoyment together. Positive affects clearly dominate the interaction.

- All key components are displayed and overall motivation and eagerness to learn is great.