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**An Exploration of Emotion Language Use by Preschool-Aged Children and their Parents: Naturalistic and Lab Settings**

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**An Exploration of Emotion Language Use by Preschool-Aged Children  
and their Parents: Naturalistic and Lab Settings**

**by**

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This is dedicated to  
my extraordinary parents: Dave Fellows and Deb Beebe.

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# **An Exploration of Emotion Language Use by Preschool-Aged Children and their Parents: Naturalistic and Lab Settings**

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Emotion language use provides insight into a person's emotional landscape. However, little is known about how preschool aged children and their parents use emotion language in their real world interactions. To address the shortcomings of the current body of empirical work on naturally occurring emotion language, this dissertation asks the following four research questions: 1) How do children and parents use emotion words in their daily lives?; 2) How is children's emotion language related to parents' emotion language?; 3) How is emotion language use related to emotional functioning?; and 4) How does emotion language in a lab setting compare to a natural setting?

The first question relates to descriptive information that is unknown about emotion language use in real world interactions of young children and parents. Points of interest include whether family members differ in rates of emotion language use, whether use of positive and negative emotion words are related within a family member, and how stable emotion language use is over a one year interval.

The second question addressed by this dissertation relates to the relationship between parent and child emotion language use. From a social learning theory perspective, it would be expected that children's emotion language use will be related to parents' emotion language use. However, gender plays a large role in emotion socialization so will likely impact the correspondence between parent and child emotion language.

The third goal is to examine what the emotion language used by an individual illuminates about his/her emotional world. Two competing models are possible: emotion language as a reflection of emotion experience or emotion language as an emotion regulation strategy. The reflection model posits that emotion word use simply mirrors an individual's emotional experience, leading to the prediction that individuals who use more emotion language, particularly negative emotion language, demonstrate more emotional dysfunction. The regulation model, on the other hand, suggests that using emotion words acts as an emotion regulation technique, leading to the prediction that people who use more emotion language would actually be expected to show less emotional dysfunction.

The last goal of this dissertation is to evaluate the ecological validity of emotion language measurement in traditional lab settings. The vast majority of research on parent-child emotion language comes from laboratory based paradigms. To date, no empirical work has measured emotion language in naturally occurring parent-child interactions to see if use in the lab corresponds to use in everyday life. The methodology of this project will be able to answer this question because emotion language use by families is measured in both settings.



This dissertation implements a naturalistic methodology tool to answer the above questions. Thirty-five preschool aged children and their parents were recruited to participate in a two-wave longitudinal study in which the children wore a digital recording device for one day at each of the time points to capture acoustic information about the emotion language and behaviors they and their parents use in their daily lives. Additionally, participants completed a traditional laboratory based paradigm used to study emotion language within families. Parents also completed self-report measures related to emotion functioning for themselves and their child.

Results indicate that children and their parents use high rates of positive emotion but very low rates of negative emotion in their naturally occurring interactions. This is different from lab based paradigms that elicit high rates of both positive and negative emotion language from children and parents. Next, children's use of emotion words tends to match the emotion language of their mothers more than their fathers but gender of the child also plays an important role. Very little support emerged for the emotion regulation model, as evidenced by children who cry and whine the most and who have the most behavioral problems tending to use negative emotions the most. The preponderance of the evidence suggests that emotion language reflects emotional state rather than regulates it. And, finally, the ecological validity of laboratory studies of emotion word usage is called into question by the independence of emotion language elicited in the lab and the natural expression of emotion words in a natural setting. Implications for researchers conducting work in the area of emotion language and emotional development are discussed.

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## Introduction

The emotion words a person uses provide unique insight into the emotion landscape of that individual, making it an especially important behavior to study when attempting to understand emotional development (Garner, Dunsmore, & Southam-Gerrow, 2008). For the purpose of the present project, “emotion language use” will be defined as the emotionally valenced words an individual says, such as “happy,” “sad,” “good,” and “bad.” However, a keyword search of “emotion language” in PsychInfo retrieves only 68 articles, reflecting a lack of attention to the topic. Only one of these studies measured emotion language in naturally occurring parent-child interactions outside of structured research paradigms (Wellman, Harris, Banerjee, & Sinclair, 1995). This may be because collecting naturalistic data can be difficult, time consuming, and expensive. However, measuring emotion language behavior that occurs in the natural environments of parents and children provides the most ecologically valid approach to understanding how emotion language develops and functions.

The overriding goal of this dissertation is to explore how children and parents use emotion language in natural settings. To this end, a relatively new naturalistic methodology will be used to examine various aspects of emotion language that occurs in the course of their daily interactions. Four research questions are addressed: 1) How do children and parents use emotion words in their daily lives?; 2) How is children’s emotion language related to parents’ emotion language?; 3) How is emotion language use related to emotional functioning?; and 4) How does emotion language in a lab setting compare to a natural setting?

To understand the issues surrounding these questions, general use of emotion language by children and parents will first be discussed. Next, the correspondence in use of language between children and parents will be considered. The meaning of emotion language for emotional functioning will then be explored. Finally, the issue of measuring emotion language in lab versus natural settings will be addressed.

*Use of Emotion Language in Natural Settings By Children and Parents*

Children generally start using their first words around 20 months of age (Bretherton, Fritz, Zahn-Waxler, & Ridgeway, 1986) and by the end of the 3<sup>rd</sup> year of life, three quarters of children are using words for feeling good, happy, sad, afraid, angry, loving, mean, and surprised (Ridgeway, Waters, & Kuczaj, 1985). Once their emotion vocabulary is developed, children are able to talk about their past and future emotions in addition to the things that cause emotions and the outcomes of emotional states. So from a functionalist perspective of emotion, studying how preschool-aged children talk about emotion is important as a vehicle for understanding their emotional landscapes (Bretherton et al., 1986). Of course, this leads to the question of where do children learn emotion language in the first place? A primary source is their parents.

Thompson (1994) has argued the primary task for the parents of young children is to shape and guide their children's emotional experiences. Emotion talk on the part of a child's caregivers has been implicated as a primary shaper of socio-emotional competence (Eisenberg, Cumberland, & Spinrad, 1998). The importance of parents in this domain may be related to the abstract nature of emotions. Emotion words refer to internal states, a concept that children only begin to understand with the emergence of their theory of mind, so cannot be directly explored like other objects in a child's

environment. Because emotions are not concrete objects, children may have a more difficult time mastering emotion words and ideas than they would more concrete concepts. Therefore, emotions may be especially challenging to learn to master if caregivers do not talk extensively about them, either directly (e.g., discussing a child's sadness when a peer does not want to play) or indirectly (e.g., a parent's emotional language when recounting the frustration of their work day over dinner). Essentially, emotion language use and explanation from a caregiver help the child to develop clear interpretations of the causes, content, and consequences of emotion messages, both in themselves and in others (de Rosnay & Hughes, 2006; Denham, Zoller, & Couchoud, 1994; Fujiki, Brinton, & Clarke, 2002; Harris, 1999).

Despite the importance of emotion language in understanding emotional processes and functioning, there is a lack of naturally collected data on this topic. Little is known about the basic descriptive properties of emotion language use by families in their daily lives, such as rates of positive and negative emotion words used by children and parents. Therefore, an important first step to a more ecologically based understanding of how emotion language functions in families is to document the frequency and type of emotion language that is used in their daily lives.

Also of interest is whether an individual's rates of positive and negative emotion words are related within naturally occurring language. Several implicit and explicit models of emotion word use exist. Layperson models are based on the belief that people generally feel positive or negative but not both simultaneously – in short, use of positive and negative emotions might be negatively correlated. More empirically-grounded research based on self-reports of emotional state indicates that positive and negative

affect are essentially uncorrelated (e.g., Diener & Emmons, 1984; Watson & Tellegen, 1985). A third plausible model is that people are either generally emotional or generally non-emotional, implying that positive and negative emotion words would be positively correlated. Identifying which model is most accurate will help clarify how positive and negative emotional states function in an individual's daily life and interactions.

Additionally, nothing is known about how use of emotion language changes across time. Evidence from the general language development literature indicates that there is much stability in children's specific and general language performance (Bornstein, Hahn, & Haynes, 2004), language learning (Aram, 2005), and phonological processing abilities required for reading (Wagner, Torgesen, Rashotte, Hecht, Barker, Burgess et al., 1997). However, given that emotional development is an ongoing process throughout the early years of childhood, it is unclear how much stability will be found in children's use of emotion language in particular.

Parents, on the other hand, do not face the same developmental changes and already possess fairly mature emotion vocabularies. Previous work using naturalistic methodologies has found adult emotion language to be stable across a four week period (Mehl & Pennebaker, 2003) but it is unknown whether this will hold over a longer period, such as a year.

#### *Correspondence in Emotion Language Use By Children and Parents*

The predominant explanation of how parents socialize children's emotion development comes from social learning theory (Bandura, 1977; Morris, Silk, Steinberg, Myers, & Robinson, 2007). This perspective posits that children learn by observation, imitation, and modeling, which is indeed true for emotional expression; parents who

show more positive emotion have children who also show more positive emotion (Zhou et al., 1992). This theory would predict that children and parents use emotion language in similar ways too. Indeed, Dunn, Bretherton, and Munn (1987) have shown that in brief at-home observations of parent-child reading, children of mothers who mentioned more emotion words at 18 months used more emotion words themselves at age 24 months.

It is also possible that there is little correspondence between parent and child emotion language use when boys and girls are grouped together because parents have been found to vary emotion talk based on their children's gender. In laboratory as well as home observation studies, mothers talk about emotions more with girls than with boys (Dunn et al., 1987; Garner, Carlson Jones, Gaddy & Rennie, 1997; Kuebli, Butler, & Fivish, 1995). Further, girls receive more emotion labels while boys receive more emotion explanations from mothers (Cervantes & Callanan, 1998; Fivush, 1989). Therefore, without controlling for gender, parent and child emotion word use may not show much correspondence.

Although exposure to more emotion language from parents likely helps children better grasp emotion vocabulary and knowledge, it is important to note that simply using emotion language may not necessarily lead to positive outcomes. Next, the ways in which emotion language use may be related to emotional functioning for both children and parents will be considered.

### *Emotion Language and Emotional Functioning*

The emotion language an individual uses provides insight into that person's emotional landscape. However, it is unclear exactly which part of the landscape emotion words actually illuminate. According to the Sapir-Whorf Hypothesis (Whorf, 1956),

human language shapes human thinking. This perspective suggests that emotion language use impacts one's interpretation and experience of emotion (Slobin, 1996). There are two possible models by which this could be manifested: emotion language as a reflection of emotion experience and emotion language as an emotion regulation strategy.

The *reflection model* posits that emotion word use simply mirrors an individual's emotional experience. In other words, people who use more emotion words are the people who are more emotional. This would lead to the prediction that individuals who use more emotion language, particularly negative emotion language, do so because they experience more emotional dysfunction. For example, a parent who suffers from high levels of anxiety may express more anxiety, thereby using more negative emotion words than a parent who is less anxious.

The *regulation model*, on the other hand, suggests that using emotion words acts as an emotion regulation technique. Emotion regulation involves the methods individuals use to impact what emotions they have, when they have them, and how they experience and express them (Gross, 1998). Individuals who use a higher rate of emotion words may be doing it to alleviate emotional experiences as they arise, or even avoid arousal in the first place (Bretherton et al., 1986; Denham, 1998; Eisenberg et al., 1998). From this perspective, people who use more emotion language would actually be expected to show less emotional dysfunction. For example, a child frustrated with a sibling for not sharing a toy and who does not have the emotion lexicon to understand and respond to their emotion arousal is likely to channel it into problematic behaviors such as tantrums, aggression, crying, etc. But if the child understands the feeling and can use emotion words to seek social support from a parent or address the sibling directly, the negative

experience will diffuse more quickly. It seems that parents have an intuitive sense of this model when they encourage their young children to “use your words” in the face of emotional challenges.

In the present project, parent emotion functioning will be assessed by measuring trait emotionality and expressivity, depression level, and emotion regulation strategies. For children, emotion functioning will be measured by parent ratings of temperament, emotion regulation, and problem behaviors as well as observed emotion behaviors (e.g., crying, laughing, etc) and lab assessments of emotional understanding.

### *Emotion Language in Natural Versus Lab Settings*

The vast majority of the research literature that exists on parent-child emotion language has relied on laboratory based paradigms. To date, no empirical work has directly compared emotion language use in naturally occurring parent-child interactions from the real world with emotion language use in the lab. The final goal of this dissertation is to evaluate the ecological validity of emotion language measurement in traditional lab settings by comparing it to emotion language use measured naturally.

One common way researchers have measured parent-child emotion discourse is through a reading task done in a research laboratory (Laible, 2004a). In this task, the parent and child are left alone with a storybook chosen for its negative emotion content (usually sad or mad) and told to read like they would at home. The recordings of these interactions are transcribed for language which is used outside the text of the actual story line. The transcriptions are then coded for use of positive and negative emotion words by both the parent and the child. However, there are several significant limitations to this

approach which make it difficult to know whether the lab-based emotion talk reflects real-world emotion talk.

First, the interaction is artificial because children and parents are asked to act in the lab, in the presence of researchers and video cameras, as they would in the privacy of home. It is unlikely that the behavior captured is free of demands created by parents trying to act as they “should.” Parents know they are being observed so may engage in more talk and explanation than they would in their own homes. Also, the story being read focuses exclusively on negative emotion, leaving little opportunity to discuss positive emotion. This may inadvertently cause a gender bias due to the differences in gender socialization of emotion if, for example, the content of the story concerns anger versus sadness (Brody, 1985, 1999). Second, this task is typically done with rather than fathers. Fathers are generally difficult to recruit for research studies but, being part of the family unit, they are likely an integral part of the emotional development of children and therefore should not be ignored.



## Overview of Research Questions and Studies

The overall goal of the current dissertation is to collect ecologically valid data on naturally occurring emotion talk in families with preschool-aged children to address the following four research questions:

*Research Question 1: How do children and parents use emotion words in their daily lives?*

The first question addresses the basic parameters of emotion language use in naturally occurring interactions by children and parents, such as frequency of emotion word use, ratio of positive to negative emotion words, and stability in emotion word use across time.

*Research Question 2: How is children's emotion language related to parents' emotion language?*

Beyond basic parameter information, it is also of interest to know how dyads within a family use emotion language when compared with one another. Do children model the emotion language used by parents, as social learning theory would posit? Do child variables, such as gender, impact whether children and parents use emotion language in the same way?

*Research Question 3: How is emotion language use related to emotional functioning?*

It is unclear exactly what emotion word use indicates about an individual's emotional health. Does emotion language provide information about an individual's

emotional experience, as posited by the reflection model, or does it act as an emotion regulation technique, as posited by the regulation model?

*Research Question 4: How does emotion language in a lab setting compare to a natural setting?*

Much of what is known about emotion language use in children comes from data collected in structured lab environments. One of the main purposes of this project is to learn whether the emotion language used in these lab settings is the same as or different from emotion language used in naturally occurring conversations and settings.

To address these questions, data were collected at two time points approximately 12 months apart, henceforth referred to as Time 1 (initial session) and Time 2 (12 month follow up). At Time 1, mothers and fathers completed questionnaires about themselves and their child online. The parents and child then came into the lab and completed a storybook task to measure lab-based emotion language use. Following the lab procedure, a recording device was sent home for the child to wear for one day to measure naturally occurring emotion language use. At Time 2, parents again completed an online questionnaire about their child. The child returned to the lab for assessment of their emotional understanding and vocabulary ability and a recording device was sent home for the second time to collect naturally occurring emotion language use for one day.

## Methods

### *Participants*

A total of fifty two-parent families with 3- to 5-year-old children were recruited at Time 1 through local daycare centers and postings on craigslist.com. However, three families did not properly activate the child's recorder and one family dropped out on the first day of the study, leaving 46 families.

Families who participated at Time 1 were contacted via email approximately 11 months after their initial lab visit and invited to participate in a follow-up. Forty-one of the original mothers and 36 of the fathers completed the online survey. Of these, 36 families (78% of the Time 1 sample) returned to the lab for the portions of the follow up study. One family was excluded because the child's recording was less than the required length of 1 hour and 15 minutes (150 30-second segments), leaving 35 families in the study. The children included in the final sample are 14 boys (*mean age at Time 1* = 4 years 1 month, *SD* = 11 months, *range* = 39 to 71 months; *mean age at Time 2* = 5 years 0 months, *SD* = 11 months) and 21 girls (*mean age at Time 1* = 4 years 6 months, *SD* = 9 months, *range* = 38 to 68 months; *mean age at Time 2* = 5 years 6 months, *SD* = 9 months).

Although a traditional family unit was not a prerequisite for participation, each family consisted of a married mother and father. The age of the mothers ranged from 22 to 51 years with an average of 34.7 years (*SD* = 5.5). Fathers' ages ranged from 24 to 53 years with an average of 34.9 years (*SD* = 5.7). The annual household income ranged from \$30,000 to \$500,000, with a median and modal income of \$85,000. Of the mothers, 25 identified themselves as white, 9 as Hispanic, and 1 as African American. Of the

fathers, 26 identified themselves as white, 6 as Hispanic, 2 as African American, and 1 as Multi-racial. The average marriage duration for couples was 7 years 9 months ( $SD = 3$  years 6 months).

Independent t-test and Chi-Square analyses were conducted to see whether the families who dropped out between Time 1 and Time 2 were different from the families who remained in the sample. There were no significant differences in either mother age,  $t(44) = -1.36, n.s.$ , or father age,  $t(44) = -0.87, n.s.$  A marginally significant difference in annual household income was found,  $t(43) = -1.74, p=.09$ , with the means indicating that the families who completed both Time 1 and Time 2 had a higher annual income than the families who just completed Time 1 (\$110,290 vs. \$62,500 respectively). Chi-square tests were used to examine whether there were differences in ethnicity between those who dropped out and those who completed. None were found for mothers,  $\chi(4, N=46) = 7.74, n.s.$ , or fathers,  $\chi(3, N=46) = 0.47, n.s.$  Finally, dropouts did not differ from those who completed in child gender,  $\chi(1, N=46) = 0.10, n.s.$

### *Questionnaire Measures*

Each parent completed six questionnaires plus demographic questions online before coming to the laboratory at Time 1 and one questionnaire at Time 2.

#### *Time 1*

*Parent Depression.* Each parent completed either the Beck Depression Inventory (BDI, Beck et al., 1988) or a short form of the Center for Epidemiological Studies-Depression scale (CES-D Short Form; Cole, Rabin, Smith, & Kaufman, 2004; Radloff, 1977). The BDI is a 12-item scale where the participant is forced to choose one of four options that best describes them (example: 0 = I do not feel like a failure, 3 = I feel like a

complete failure as a person). Scores of less than 10 are considered normal, 10-18 indicate mild depression, and 19 or more indicates an individual in moderately to severely depressed. The CES-D Short Form is 10-items that asks how often the participant experienced a symptom in the past week using a 4-point Likert scale (0 = Rarely or none of the time/Less than one day, to 3 = Most or all of the time/5-7 days). A score of 10 or higher indicates an individual is depressed. Using the appropriate cutoffs for each scale, it was determined that 16 parents in total (approximately 22%) qualified as having significant distress and being at risk for being diagnosed with clinical depression.

The variation in which depression scale was completed by each parent was caused by copyright issues with the BDI. The resulting scale breakdown was such that seven mothers and 6 fathers completed the BDI, 28 mothers and 28 fathers completed the CES-D Short Form, and one father did not complete either depression scale. Z-scores were computed for the analyses.

*Parent Trait Emotion.* The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) was used to measure both positive and negative trait affect of each parent. This scale includes 20 items that are rated on a 5-point Likert scale (1= Very slightly or not all at, 5 = Extremely), with higher scores indicating more of that particular emotionality.

*Parent Emotion Expressivity.* The Self Expressivity in the Family Questionnaire Short Form (SEFQ Short Form; Halberstadt, Cassidy, Stifter, Parke, & Fox, 1995) was used to measure how emotionally expressive each parent considered themselves to be in the family context. This self-report scale includes twelve items measuring positive expression and twelve items measuring negative expression that are rated for frequency

on a 9-point Likert scale (1 = Not at all frequently, 9 = Very frequently), with higher scores indicating more expressivity.

*Parent Emotion Regulation.* The Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) was used to measure emotion regulation strategies employed by each parent. This scale includes 10 items that are rated on a 7-point Likert scale (1 = Strongly disagree, 7 = Strong agree) to measure both Reappraisal and Suppression, with higher scores indicating more utilization of each strategy.

*Child Temperament.* The Children's Behavior Questionnaire Short Form (Rothbart, 1988) assesses temperament in children between the ages of three and seven years. It measures 14 temperament factors, including Activity Level, Anger/Frustration, Attentional Focusing, Discomfort, Falling Reactivity/Soothability, Fear, High Intensity Pleasure, Impulsivity, Inhibitory Control, Low Intensity Pleasure, Perceptual Sensitivity, Sadness, Shyness, Smiling and Laughter. Items are rated by the parent on a seven point Likert scale (1 = Extremely untrue of your child, 7 = Extremely true of your child) for behavior over the past six months, with higher scores indicating more of each factor. Both the mother and father were instructed to completed the questionnaire independently. The dimensions can be combined into three broad temperamental dimensions (following Rothbart, Ahadi, Hershey, & Fisher, 1994): *Surgency* (consisting of activity level, high intensity pleasure, impulsivity, and the inverse of shyness), *Negative Emotionality* (consisting of anger, discomfort, fear, sadness, and the inverse of soothability), and *Effortful Control* (consisting of attentional focusing, inhibitory control, low intensity pleasure, and perceptual sensitivity).

*Child Emotion Regulation.* The Emotion Regulation Checklist (ERC; Shields & Cicchetti, 1995) was used to gauge the children's emotionality and emotion regulation tendencies. This questionnaire contains 24 items and measures. Parents rated the items on a four point Likert scale (1 = Never, 4 = Almost always). Both the mother and father completed the questionnaire independently.

#### *Time 2*

*Child Socio-Emotional Functioning.* Parents completed the Child Behavior Checklist (CBCL, Achenbach, 1994) for their child, which measures children's level of problematic behaviors between the ages of 4 and 18 years. The questions form 7 subscales: Withdrawn, Somatic Complaints, Anxious/Depressed, Aggressive Behavior, Delinquent Behavior, Social Problems, Thought Problems, and Attentional Problems. Items are rated by the parent on a three point Likert scale (0 = Not true; 2 = Very true or often true) for behavior over the past six months, with higher scores indicating more of each factor. Both the mother and father completed the questionnaire independently. These subscales can be combined to form two broader subscales: *Internalizing Behavior* (consisting of Withdrawn, Somatic Complaints, and Anxious/Depressed) and *Externalizing Behavior* (consisting of Aggressive Behavior and Delinquent Behavior).

The CBCL is a clinical tool and, traditionally, children's scores are used to classify the range in which a child is functioning. In the present sample, 29 children fell in the normal range for Internalizing Behavior, two in the moderate level, and one in the clinical level based on an average of the mother's and father's ratings. For Externalizing Behavior, 30 children fell in the normal range, none in the moderate level, and two in the clinical level. For the purpose of analyses for this dissertation, CBCL scores will be

treated both as a continuous variable and as a categorical one to address different questions.

Table 1

*Overview of Data Collected at Times 1 and 2*

	Time 1	Time 2
Questionnaires		
<i>Self-Report</i>	Depression Inventory Positive and Negative Affect Schedule Self Expressivity in the Family Questionnaire Emotion Regulation Questionnaire	
<i>Child-Report</i>	Emotion Regulation Checklist Children's Behavior Questionnaire	Child Behavior Checklist
Natural Measures		
	Recording Device SECSI Behaviors	Recording Device SECSI Behaviors
Lab Measures		
	Storybook Reading Task	Emotional Understanding Task Peabody Picture Vocabulary Test



### *Streamlining Questionnaire Data*

In an effort to streamline analyses and reduce redundant information, it was decided that subscales that were significantly correlated with other subscales would be dropped from consideration in further analyses. An effort was made to maintain parallel measures for the parents and child when subscales were highly correlated and one was to be dropped. For example, high correlations between the parent PANAS and SEFQ subscales made each a good candidate for cutting. The PANAS subscale was retained because its emotional information for the parent is similar to the Negative Affectivity subscale for children.

In the end, the following four subscales were dropped for both the mothers and fathers: the Positive and Negative Expressivity factors from the SEFQ, and Social Problems and Thought Problems from the CBCL. The remaining 13 subscales include: Parent Depression (either BDI or CES-D), parent Positive and Negative Affect from the PANAS, parent Reappraisal and Suppression from the ERQ, child Negativity/Lability and Emotion Regulation from the ERC, child Surgency, Negative Affectivity and Effortful Control from the CBQ, child Internalizing and Externalizing Behavior from the CBCL, as well as the Attentional Problems subscale from the CBCL.

### *Missing Questionnaire Data*

In order to avoid having some parents' data excluded because of missing responses on a few items, multiple imputation analyses (Rubin, 1976) were conducted using the MICE command in R (Turner, 2004) for the ERC, CBQ, and CBCL. Each questionnaire had a missing data rate of about 1%, but this low rate would have increased

greatly when forming subscale scores across individual items. The MICE imputation process works by creating plausible missing values from the body of existing values.

#### *Naturalistic Assessments: The EAR*

In order to assess both parental emotion language and reactions to emotion in naturally occurring parent-child interactions, each child wore a continuous recording device throughout the course of their day. The child recording device is a modified version of a similar device called the Electronically Activated Recorder (EAR) that has been used in studies with adult participants (Mehl, Pennebaker, Crow, Dabbs, & Price, 2001). The adult EAR device is a Pocket PC that is programmed to activate and record sounds in the environment on a predetermined sampling schedule over numerous days.

A modified version of the EAR device was used for children in this study. To reduce the strain of both the size of the recorder and time requirements on the child, a small Sony digital voice recorder (model # ICD-P320) was used instead for one day. This recorder is one inch wide and four inches long, weighs 3.2 ounces and is able to record for up to 19 hours in standard play mode. The recorder was worn by the child inside a “special magic shirt” that was designed specifically for this study. Each shirt had an internal pocket built into the front that was covered by a piece of cloth with colorful cartoon characters on it. This allowed the recorder to be “out of sight, out of mind” for the child and for the recorder to be in a stable, safe place regardless of what activity the child may engage in.

This methodology allows for a unique glimpse into the real life verbal and behavioral interactions between children and their parents. Each child was allowed to pick the shirt they wanted to wear from several shirts. The recorder was worn for one

day, either a Saturday or Sunday, and recorded continuously from the time the child woke up (and the parent activated the recorder) until either bedtime or as long as the parent was able to keep the shirt on the child. The recordings ranged in length from 2 hours 19 minutes to 15 hours 22 minutes, with an average of 10 hours 1 minute ( $SD = 3$  hours 32 minutes). For the purposes of this study, 150 randomly selected 30 second sound files were coded for each child. This approach was taken to standard the amount of interaction time that would be transcribed and coded across participants (and thereby standardizing the standard errors of the resulting data). Participants who used fewer than 100 words across the 75 minutes of randomly chosen recorded segments were dropped from analyses. This included two fathers but no mothers at Time 1.

Each child again wore the Child EAR for one continuous day at Time 2 (either on a Saturday or Sunday). The recordings ranged in length from 1 hour 17 minutes to 13 hours 25 minutes, with an average of 8 hours 59 minutes ( $SD = 3$  hours 55 minutes). Again, 150 randomly selected 30-second sound files were coded for each child and participants who used fewer than 100 words across those files were dropped from analyses. This included three fathers and one mother at Time 2.

#### *Measurement of Language Use*

The EAR recordings were transcribed into text files to be analyzed using a computerized text analysis program called Linguistic Inquiry and Word Count (LIWC, Pennebaker, Booth, & Francis, 2007) and coded by research assistants. The LIWC program creates an output that reflects the overall percentage of the total words spoken that fall into each preset category. The categories of interest for this study are positive and negative emotion words used by both the mother and the father.

An alternative way to measure the relative use of language between pairs of people is to employ Language Style Matching (LSM) analyses. LSM, which has previously been used with people's use of pronouns, prepositions, and other function words (Ireland & Pennebaker, in preparation; Niederhoffer & Pennebaker, 2002), calculates the relative use of positive and negative emotions between pairs of people. For example, we can compute positive emotion LSM scores between the mother and father using the following equation:

$$1 - [abs(posemoM - posemoF)/(posemoM + posemoF + 001)]$$

where abs = absolute value, posemoM = positive emotion of mother, posemoF = positive emotion of father.

A similar statistic can be calculated for the relations between each parent and the child and for all pairs with negative emotions. The score ranges from 0 (no matching) to 1.0 (perfect LSM). In previous work, the LSM scores for emotion word use have ranged from .50s in writing tasks to .80s in lab meetings. LSM scores were calculated between child-mother, child-father, and mother-father dyads at both Times 1 and 2.

#### *Measurement of Behavior*

To supplement this quantitative text analysis approach with a more qualitative method, a coding system was used. Previous EAR audio data collected by our lab has been coded with the Social Environment Coding of Sound Inventory (SECSI; Mehl & Pennebaker, 2003). The coding system provides information about the person's current location (e.g., in apartment, outdoors, in transit), activity (e.g., talking, watching TV, eating), and mood (e.g., laughing, crying, sighing). This coding schema was adapted for

children and their age specific interactions. For example, the location of “Work” was removed and replaced with “Playground.”

Inter-coder reliabilities for the coding and ratings of the recoded data were determined from a set of training recordings (235 30-second sound files) independently coded by the 20 research assistants who transcribed and coded these data. Intraclass correlations based on a two-way random effects model were computed across research assistants for each coding category.

### *Laboratory Assessments*

#### *Measurement of Language Use*

In order to assess emotion in a laboratory setting at Time 1, a task was used that was similar to what researchers have used in the past (e.g., Laible, 2004a). In this task, each parent reads a story with the child. The storybook read was either *Just a Bad Day* by Gina and Mercer Mayer or *Alexander and The Terrible, Horrible, No Good, Very Bad Day* by Judith Viorst. These particular stories were chosen based on their negative emotion content and opportunity for emotion talk and discussion. The reading task was video recorded and transcribed.

The transcriptions of the reading task interactions were first analyzed using the LIWC text analysis program for positive emotion words and negative emotion words to provide a direct comparison to emotion language use in the natural setting. Additionally, the transcriptions were coded for any references to emotions discussed by either parents or children during the reading to remain in line with procedures used by previous researchers with this task (following a coding schema adapted from Dunn & Munn, 1987, and from Kuebli, Butler, & Fivush, 1995). From the transcriptions of the videotapes, all

references to emotions that were not part of the words printed in the storybook were identified. References to emotions included words referring to prototypical emotional states (e.g., *mad, angry, sad, happy*) as well as words indicative of emotional states (e.g., *crying, laughing, screaming*). In addition, once a reference to an emotion was identified from the videotape, the speaker who made the reference (i.e., mother vs. child) and the valence of the emotion was also coded (i.e., positive or negative). Composite scores for total positive and total negative words used were produced by summing parent and child references. Intraclass correlations based on a two-way random effects model were computed to test inter-rater reliability between the three research assistants for emotion coding on the reading lab task.

#### *Verbal Ability*

The Peabody Picture Vocabulary Test-Third Edition (PPVT; Dunn & Dunn, 1997) was used to measure each child's vocabulary ability at Time 2. In this task, the experimenter read a word to a child and then asked the child to pick the line drawing from a group of four that matched the target word.

#### *Emotional Understanding*

To assess emotional understanding at Time 2, a two part affective perspective taking task was used during the child's lab visit (Denham, 1986). The first task measured ability to label facial expressions by asking children to both match schematic emotion faces with their label (e.g., "Show me the angry face") and asked them to report which emotion the face is expressing (e.g., "How does this face feel?"). The second task required the child to watch hand puppets enacting 16 vignettes that are accompanied by visual and vocal cues from the experimenter (e.g., a big frown and tearful voice when the

puppet is meant to feel sad). In half of the vignettes, the puppet expressed the emotion most people will feel in that situation while, in the other half, the puppet expressed an emotion that is opposite what would be expected. At the end of each vignette, the child was asked “How did the puppet feel?” and then was asked to affix the proper schematic face to the puppet.

### *Procedure*

#### *Time 1*

Families interested in participating were sent an email with details about the study and were subsequently telephoned to answer any questions they might have and schedule a time for participation. Both the mother and father were separately sent an email with a link to the survey online and were asked to complete the questions alone. They were also assured that their partner would not see their responses in an effort to increase honest and accurate responding. Parents were asked to complete the survey prior to arriving to the lab appointment.

Families came to the laboratory where informed consent was obtained and details about the study were explained to the parents. First, one parent read a storybook to the child and then the other parent did so. The order in which the storybooks were read and which parent read first was counterbalanced. Before leaving the lab, the parents were given instructions about how to use the child recorder device. The family then returned the device on a day shortly after the child wore the recorder. Each family was fully debriefed, paid, and then thanked for their participation. Families were paid \$50-\$200 for their participation (depending on several time factors).

## *Time 2*

Each family that provided complete data at Time 1 was contacted by email 11 months after their initial participation. Both the mother and father were emailed an online questionnaire separately and asked to complete it alone. Once the online questionnaire was completed by a parent another email was sent asking if they would be willing to return to the lab for one one-hour visit with their child and to have the child wear the digital recorder for one weekend day. Consenting families were scheduled for a time when the child and one parent could come to the lab. Upon arrival at the lab, the details of the study were explained to the parent and consent was obtained. Next, the child was asked to complete both the PPVT vocabulary test and the puppet task to measure EU. Before leaving, the parent was again shown how to use the Child EAR and was asked to set up a time to return the Child EAR early the following week. When the Child EAR was returned, parents were paid, debriefed, and thanked for their participation. Each family was offered \$40 for their continued participation at Time 2 and entered into a raffle for a \$100 gift card.



## Descriptive Results

Before directly addressing the five main research questions, this section will provide descriptive information on the questionnaires completed by parents, emotion language use in the natural and lab setting, and the laboratory based assessments of children.

### *Questionnaires*

Tables 2 and 3 provide descriptive information for parent ratings of themselves and their child on all questionnaires administered online across the study while Table 4 displays correlation values between subscales from the questionnaires.

Table 2

#### *Means, Standard Deviations, Alphas, Inter-Parent Agreement, and Example Item for Subscale of the Parent Self-Report Questionnaires*

Questionnaire and Subscales	Mothers <i>Mean (SD)</i>	Fathers <i>Mean (SD)</i>	Internal Reliability ( $\alpha$ )	Interparent Agreement ( $r$ )	Example Item
<i>BDI</i>	1.57 (1.51)	0.75 (0.96)	.44	.41	“I don’t feel disappointed in myself” to “I hate myself.”
<i>CES-D Short Form</i>	9.96 (2.98)	7.71 (2.49)	.41	.14	“I thought my life has been a failure.”
<i>PANAS</i>					
Positive Affect	5.33 (0.74)	5.22 (0.86)	.89	-.05	“Interested.”
Negative Affect	2.75 (1.02)	2.29 (0.79)	.88	.32+	“Distressed.”
<i>SEFQ</i>					
Positive Expression	7.22 (1.08)	6.41 (1.33)	.91	-.11	“Expressing gratitude for a favor.”
Negative Expression	3.99 (1.13)	3.61 (0.97)	.80	.32+	“Expressing anger at

					someone else's carelessness."
<i>ERQ</i>					
Reappraisal	29.79 (7.53)	30.57 (6.95)	.90	.32+	"When I want to feel more position emotion, I change what I think about."
Suppression	10.85 (4.82)	14.43 (4.80)	.84	.03	"I control my emotions by not expressing them."

Note: +  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$

Table 3

*Means, Standard Deviations, Alphas, Inter-Parent Agreement, and Example Item for Subscale of the Parent Child-Report Questionnaires*

Questionnaire and Subscales	Mothers Mean (SD)	Fathers Mean (SD)	Internal Reliability ( $\alpha$ )	Interparent Agreement ( $r$ )	Example Item
<i>ERC</i>					
Lability/Negativity	1.90 (0.33)	1.97 (0.43)	.81	.63**	"Is easily frustrated."
Emotion Regulation	3.66 (0.92)	3.47 (0.36)	.71	.04	"Can say when s/he is feeling sad, angry or mad, fearful or afraid."
<i>CBQ – Short Form</i>					
Surgency	4.53 (0.86)	4.68 (0.73)	.69	.76**	
			.71	.58**	<i>Activity Level:</i> "Is full of energy, even in the evenings."
			.64	.76**	<i>High Intensity Pleasure:</i> "Likes to go high/fast when pushed on a swing"
			.75	.58**	<i>Impulsivity:</i>

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					“Often rushes into new situations.”
			.85	.69**	<i>Shyness (inverse):</i>
					“Acts shy around new people.”
Negative Emotionality	3.81 (0.58)	3.82 (0.64)	.49	.42*	
			.69	.57**	<i>Anger:</i>
					“Gets angry when told s/he has to go to bed.”
			.78	.44**	<i>Discomfort:</i>
					“Is quite upset by a little cut or bruise.”
			.73	.64**	<i>Fear:</i>
					“Is afraid of burglars or the ‘boogie man’.”
			.45	.20	<i>Sadness:</i>
					“Cries when a favorite toy gets lost or broken.”
			.70	.44**	<i>Soothability (inverse):</i>
					“Is easy to soothe when s/he is upset.”
Effortful Control	5.36 (0.63)	5.02 (0.53)	.64	.68**	
			.73	.56**	<i>Attentional Focusing:</i>
					“Is easily distracted when listening to a story.”
			.70	.49**	<i>Inhibitory Control:</i>
					“Is good at following instructions.”
			.53	.44**	<i>Low Intensity Pleasure:</i>
					“Enjoys ‘snuggling up’ next to parents.”
			.71	.38*	<i>Perceptual Sensitivity:</i>

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					“Seems to listen to even quiet sounds.”
<i>CBCL</i>					
Internalizing Behavior	4.03 (3.39)	3.77 (3.57)	.44	.32+	
			.45	.40*	Withdrawn: “Rather be alone.”
			.35	.64**	Somatic Complaints: “Aches.”
			.66	-.16	Anxious/Depressed: “Fearful.”
Externalizing Behavior	8.49 (5.07)	8.65 (6.37)	.45	.64**	
			.42	.47**	Delinquent Behavior: “No guilt.”
			.81	.43*	Aggressive Behavior: “Argues.”
Other Problem Behavior	1.14 (1.19)	1.32 (1.34)	.26	.25	Social Problems: “Acts young.”
	0.31 (0.68)	0.71 (1.21)	.33	.31+	Thought Problems: “Strange ideas.”
	2.43 (2.08)	2.77 (1.89)	.72	.01	Attentional Problems: “Day-dreams.”

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*Note:* +  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$

Table 4

*Correlations Between Questionnaire Subscales*

	PANAS POS	PANAS NEG	DEPRESSION Z	POS EXPRESS	NEG EXPRESS	REAPPRAISAL	SUPPRESSION	NEGATIVITY	EMO REGULAT	SURGENCY	NEGATIVITY	EFF CONTROL	INTERNALIZING	EXTERNALIZING	SOCIAL PROBS	THOUGHT PROBS	ATTENTION PROB
PANAS POS		-.41*	.16	.26*	-.27*	.09	-.09	-.40*	.41*	.05	-.16	.25*	-.07	-.35*	-.09	-.13	.00
PANAS NEG			-.33*	.04	.53*	-.26*	.08	.21+	-.04	.02	.27*	-.08	-.01	.17	.16	.04	-.18
DEPRESSION Z				-.12	-.26*	-.01	.33*	-.17	-.06	.03	-.07	.02	-.11	-.18	-.14	-.03	-.08
POS EXPRESS					-.25*	.18	-.37*	-.13	.30*	.13	-.02	.32*	-.12	-.28*	-.07	.02	.14
NEG EXPRESS						-.25*	-.09	.13	-.16	-.09	.19	-.10	.04	.14	.14	-.04	.06
REAPPRAISAL							-.06	-.03	.05	-.22+	-.06	.07	-.05	-.14	-.16	.10	-.09
SUPPRESSION								.04	-.35*	.00	.26*	-.17	.13	.01	.07	.39*	-.01
NEGATIVITY									-.37*	.37*	.15	-.46*	.29*	.56*	.15	.26*	.07
EMO REGULAT										.07	-.06	.42*	-.04	-.09	-.03	-.19	-.02
SURGENCY												-.14	-.29*	-.08	.19	-.14	.05
NEGATIVITY													-.04	.10	.09	.17	.20
EFF CONTROL														-.08	-.36*	.05	-.23
INTERNALIZING															.46*	.87*	.39*
EXTERNALIZING																.40*	.23+
SOCIAL PROBS																	.33*
THOUGHT PROBS																	

Note: +  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$

*Parent Differences on Questionnaire Scales*

Having questionnaire data from both mothers and father provided the opportunity to compare agreement within couples, which is of particular interest for parents' reports of their children. Paired-samples t-tests were conducted at the couple level to see whether mothers and fathers differed in their responses (see Table 5). They differed on five of the thirteen subscales, including their levels of Depression, Negative Affect, and Suppression and their ratings of their children on Emotion Regulation and Effortful Control. Since no differences were found in ratings of children's problem behaviors, mother and father scores for child subscales were averaged in further analyses.

Table 5

*Parent Differences in Ratings on Questionnaires*

Subscale	N	t-value
Parents' Emotion-Oriented Variables		
<i>Depression Z-score</i>	30	3.94**
<i>Positive Affect</i>	34	0.60
<i>Negative Affect</i>	34	2.59*
<i>Reappraisal</i>	33	-0.52
<i>Suppression</i>	32	-2.95*
Children's Emotion-Oriented Variables		
<i>Lability/Negativity</i>	33	-1.18
<i>Emotion Regulation</i>	33	2.51*
<i>Surgency</i>	33	-1.27
<i>Negative Emotionality</i>	33	0.06
<i>Effortful Control</i>	33	4.09**
Children's Behavior Problems		
<i>Internalizing Behavior</i>	31	-1.67
<i>Externalizing Behavior</i>	31	-0.86
<i>Attentional Problems</i>	31	-0.42

Note: +  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$

### *Emotion Language and Behavior in the Natural Setting*

Next, the Child EAR transcripts were considered for both LIWC emotion language use and behaviors coded by the SECSI coding system.

Table 6 shows the means and standard deviations for language use in the natural recordings by each person at each time, as well as the p-value for paired sample t-tests to compare rates at Times 1 and 2. For total word count, mothers decreased in their use of words from Time 1 to Time 2 while fathers and children maintained similar levels of word use. Interestingly, a decreasing pattern in positive emotion word use emerged among parents while the opposite pattern happened for children; fathers use significantly fewer positive emotion words at the second time, and the same trend occurred for mothers. Additionally, children increased in their use of negative emotion words from Time 1 to Time 2 while both parents remained constant. The increases in the children's overall emotion word use could reflect a language maturation effect or increasing vocabulary. It is unclear why parents' positive emotion use declined, however.

Turning next to behaviors coded from the natural interactions, Table 7 shows the means and standard deviations for the percentage of all the 30-second segments in which each SECSI behavior occurred at Times 1 and 2, along with the p-value for paired sample t-tests to compare rates at Times 1 and 2. Children showed significant changes in four of the twelve behavioral variables. From Time 1 to Time 2, children spent more time with others but less time talking with their parents. Additionally, they engaged in less whining and crying as they got older. Of particular interest for the present research are the emotion behaviors.

Table 8 shows the correlations between these variables for children at Times 1 and 2. At Time 1, laughing was positively correlated with signing and crying was positively correlated with whining. At Time 2, however, these effects were not longer present and instead laughing was positively related to signing and crying moderately negatively related to signing.

Table 6

*Means and Standard Deviations of Language Use from Natural Interactions*

	Natural Setting T1 <i>Mean (SD)</i>	Natural Setting T2 <i>Mean (SD)</i>	Paired <i>t</i> -tests' <i>p</i> -values
Children			
<i>Total Word Count</i>	1,372.30 (604.27)	1,453.70 (576.92)	.39
<i>Positive Emotion</i>	2.66 (1.07)	2.98 (0.93)	.14
<i>Negative Emotion</i>	0.54 (0.43)	0.77 (0.56)	.05
Mothers			
<i>Total Word Count</i>	1,070.60 (652.11)	831.50 (438.11)	.04
<i>Positive Emotion</i>	4.47 (1.37)	3.92 (1.44)	.11
<i>Negative Emotion</i>	0.69 (0.36)	0.69 (0.44)	.81
Fathers			
<i>Total Word Count</i>	845.94 (629.07)	710.66 (333.13)	.23
<i>Positive Emotion</i>	4.15 (1.43)	3.51 (1.15)	.02
<i>Negative Emotion</i>	0.60 (0.47)	0.67 (0.37)	.51

*Note:* Means for the Word Count variables reflect a raw count; Means for Positive and Negative Emotion reflect the percentage of total words that fell into each category.



Table 7

*Means, Standard Deviations, and Stability of Behavior Coding of Child Natural Interactions*

SECSI Coding Category	T1 <i>Mean (SD)</i>	T2 <i>Mean (SD)</i>	Paired <i>t</i> -tests' <i>p</i> -values
<i>With Others</i> ( $\alpha=.89$ )	73.73 (18.44)	83.62 (23.74)	.04
<i>Talking</i> ( $\alpha=.96$ )	63.22 (12.90)	59.14 (15.24)	.22
<i>Vocalization</i> ( $\alpha=.84$ )	17.91 (10.93)	16.95 (10.18)	.71
<i>Talking to:</i>			
Parent ( $\alpha=.93$ )	40.88 (15.87)	34.02 (14.56)	.01
Sibling ( $\alpha=.53$ )	6.91 (8.66)	7.60 (9.64)	.53
Other Child ( $\alpha=.98$ )	1.71 (4.77)	5.09 (12.52)	.10
<i>Dialogue</i> ( $\alpha=.88$ )	34.71 (18.95)	33.37 (16.80)	.73
<i>Emotion Behaviors:</i>			
Laughing ( $\alpha=.88$ )	5.18 (3.48)	4.78 (3.57)	.65
Singing ( $\alpha=.93$ )	4.65 (6.02)	4.38 (4.64)	.80
Crying ( $\alpha=.42$ )	1.75 (2.48)	0.36 (0.63)	<.01
Whining ( $\alpha=.93$ )	4.29 (5.38)	1.56 (2.02)	.01
Sighing ( $\alpha=.40$ )	0.69 (1.37)	0.70 (1.05)	.93

*Note:* Mean and standard deviation values reflect the percentage of overall 30-second segments where this behavior occurred at least once. Alpha values for inter-coder reliability are reported in parentheses after each variable.

Table 8

*Correlations Between Children's Emotion Behaviors from Natural Interactions*

	Singing T1/T2	Crying T1/T2	Whining T1/T2	Sighing T1/T2
<i>Time 1</i>				
<i>Laughing</i>	.38*/-.15	-.09/.18	.08/-.10	.12/.35*
<i>Singing</i>		-.14/.11	.12/.05	.06/-.18
<i>Crying</i>			.84**/.19	.06/-.30+
<i>Whining</i>				.12/.10

### *Emotion Language in the Lab Setting*

Both the LIWC program and a manual coding approach were used to measure language use in the lab reading task between the child and parents. Table 9 presents the means and standard deviations for the percentage of overall words used that fell into each category from LIWC and the raw words counts of each category from the manual coding.

The LIWC analyses show that children used positive and negative words approximately equally while both parents used more positive than negative emotion words. The manual coding, however, reveal that all family members used more negative than positive emotion words. This is likely related to the fact that the manual coding approach only included more “pure” emotion words, such as “happy” and “mad” while the LIWC categories are more broadly defined and include more evaluative terms, such as “good” and “bad.”

### *Other Laboratory Assessments of Children*

Finally, the means and standard deviations of the lab assessments measuring emotional understanding and verbal ability are shown in Table 9. The puppet task to measure emotional understanding is broken down into four kinds of emotion knowledge: expressive (ability to label emotion expressions), receptive (ability to recognize facial expressions of emotion), situational (understanding of others’ emotions in various situations where the other’s response would match the child’s), and non-stereotypical situational (understanding of others’ emotions in various situations where the other’s response would NOT match the child’s). The PPVT is meant to quantify a child’s verbal ability in terms of vocabulary.

Table 9

*Means and Standard Deviations of Language Use from Lab Setting using LIWC and Manual Coding Techniques*

	LIWC <i>Mean (SD)</i>	Manual Coding <i>Mean (SD)</i>	Correspondence <i>(r)</i>
Children			
<i>Total Word Count</i>	83.52 (78.95)		
<i>Positive Emotion</i>	2.53 (2.74)	0.42 (0.52)	.42*
<i>Negative Emotion</i>	2.31 (3.01)	1.14 (1.41)	.34+
Mothers			
<i>Total Word Count</i>	219.09 (135.71)		
<i>Positive Emotion</i>	4.46 (2.18)	1.39 (1.72)	.21
<i>Negative Emotion</i>	2.13 (1.28)	2.69 (2.81)	.30+
Fathers			
<i>Total Word Count</i>	191.46 (127.83)		
<i>Positive Emotion</i>	4.14 (3.05)	0.57 (1.20)	.17
<i>Negative Emotion</i>	1.70 (1.48)	2.00 (3.56)	.50**

Note: +  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ ; Means for the Word Count variables reflect a raw count; LIWC means for Positive and Negative Emotion reflect the percentage of total words that fell into each category; Manual Coding means for Positive and Negative Emotion reflect total count of words coded into each category.

Table 10

*Means and Standard Deviations of Children's Emotional Understanding and Verbal Ability Scores*

Laboratory Measure	Mean (SD)
Emotional Understanding	
Expressive Knowledge	6.94 (1.01)
Receptive Knowledge	7.78 (0.79)
Situational Knowledge	15.06 (1.48)
Situational Knowledge (non-stereotypical)	19.81 (2.35)
Verbal Ability	
PPVT	70.06 (19.91)

## Research Question Results

### *Question 1: How do children and parents use emotion words in their daily lives?*

The most basic questions about emotion language use in naturally occurring family interactions related to how often positive and negative emotion words are used, whether their use is related to each other, and how stable usage is across a one-year interval.

*Part 1. How frequently are emotion words used?* At Time 1, children used an average of 1,373 total words in the 150 random 30-sec language samples. Of all the words spoken by the children during the day in the natural setting, approximately 2.7% were positive emotion words and 0.5% were negative emotion words. In comparison, mothers used a total of 1,071 words, 4.8% of which were positive emotion words and 0.7% negative emotion words. Fathers used a total of 846 words, 4.2% of which were positive emotion words and 0.6% negative emotion words.

About one year later, children said an average of 1,454 total words, made up by 3.0% positive emotion and 0.8% negative emotions. Mothers spoke an average of 832 total words, 3.9% positive and 0.7% negative, while fathers produced an average of 711 total words, 3.5% positive and 0.7% negative. So while children's overall word use increased as they grew older, parents' use decreased. The same pattern was true for use of positive emotion words, but negative emotion word use remained quite stable across the one-year interval.

*Part 2. Are positive and negative emotion words used in similar ways?* Another approach to further understanding patterns of emotion language used is to examine whether people tend to use positive and negative emotions words together, inversely, or

whether the use of the two is not related. Correlation analyses were run to see what pattern, if any, exists between a person’s use of positive and negative emotion words (see Table 10).

The striking pattern is that use of positive and negative emotions are uncorrelated for all participants in both settings, consistent with previous empirical work (Watson & Clark, 1984). This means that positive and negative emotion words are generally used independently of one another. It is therefore not the case that people are generally emotion talkers, or not. It is also not the case that a person who uses large amounts of positive emotion would use few negative emotion words, or vice versa.

Table 11

*Correlations of Positive and Negative Emotion Word Use Within Person*

	Child	Mother	Father
Natural Setting T1	.09	-.15	.25
Natural Setting T2	.27	.06	.12

Note: +  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ ,  $df = 34$

*Part 3. How stable is emotion language use over a one year interval?* The final part to this research question concerns whether children and parents use similar emotion language across time? To examine this, correlations were used to compare Time 1 emotion language use with Time 2 emotion language use (see Table 11). For the children, both positive and negative emotion language use were not consistent over the 1 year period. This was also true for negative emotion language use for mothers and fathers. However positive emotion use by mothers and fathers at Times 1 and 2 were significantly correlated. Overall, positive emotion word use appears to be more stable than negative emotion words use across the 12-month time period.

Table 12

*Stability of Emotion Language Use Over 1 Year Interval*

	Children	Mothers	Fathers
Positive Emotion	.21	.36*	.43*
Negative Emotion	.04	.02	-.15

Note: +  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ ,  $df = 34$

*Summary.* More positive than negative emotion words were used by all family members at both times, with rates of negative emotion language especially low. Additionally, the use of positive and negative emotion language within a person was unrelated, indicating that the two valences function independently of one another in naturally occurring language. Finally, positive emotion word use was stable over the 1-year time interval, particularly for mothers and father, while negative emotion word use was not stable for any family members.

*Question 2: How is children's emotion language related to parents' emotion language?*

The purpose of the second question is to examine how children and parent's emotion language use is related to each others'.

*Part 1. Do children and parents use emotion language at similar rates?* Through processes of social learning and modeling, it might be expected that children and parents use emotion language in very similar ways within a family unit. To test whether this was indeed the case, a 3 (person: child vs. mother vs. father) x 2 (time: 1 vs. 2) x 2 (emotion word valence: positive vs. negative) repeated measures ANOVA was conducted.

Significant main effects emerged for person,  $F(2, 98) = 14.75, p < .01$ , and valence,  $F(1, 98) = 851.55, p < .01$ , but not for time,  $F(1, 98) = 0.76, n.s.$ . However, all 2-way interactions were also significant.

First, the person x time interaction was significant,  $F(2, 98) = 4.79, p = .01$ . As illustrated in Figure 1, children's use of emotion words increased from Time 1 to Time 2 while both parents' use of emotion words decreased. Simple main effect tests indicate that at both Time 1 and Time 2 mothers used the most emotion words, followed by fathers and then children. Generally, mothers and fathers pattern of emotion language use across time was similar while the children showed an opposite pattern of word use.

Next, the person x valence was also significant,  $F(2, 98) = 15.56, p < .01$ , indicating differences in positive word use between the participants but not any difference in negative word use. Simple main effect tests show that mothers used more positive emotion words than fathers and that both parents used more positive emotion language than children (see Figure 2).

Figure 1. Illustration of the person by time interaction for emotion language use (positive and negative emotion words combined)

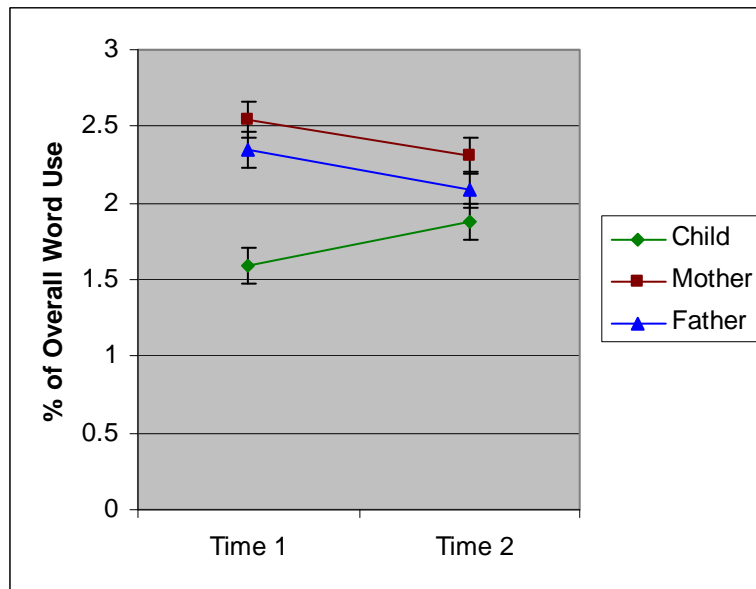
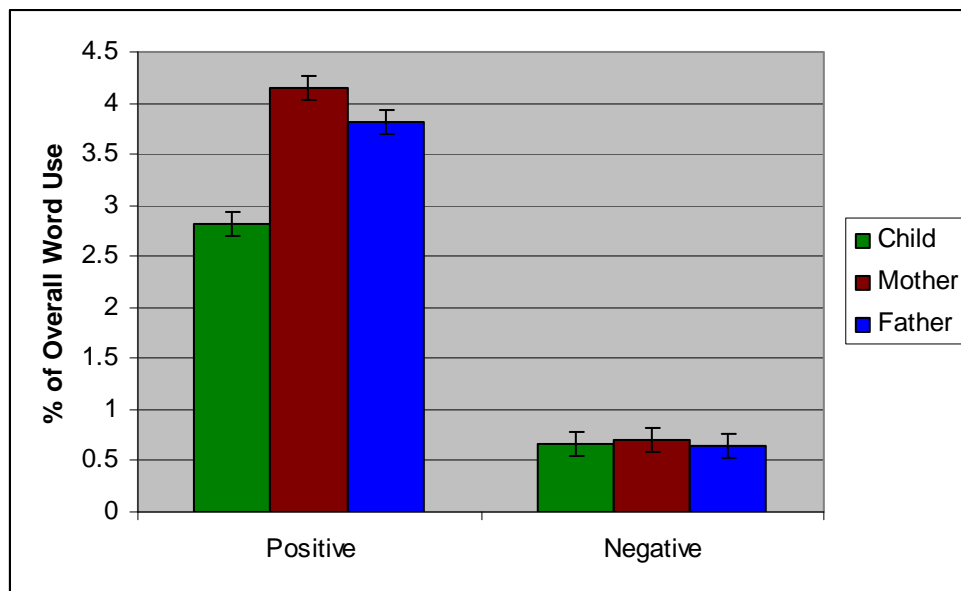


Figure 2. Illustration of the person by valence interaction for emotion language use (times 1 and 2 collapsed)



Finally, the time x valence was also significant,  $F(1, 98) = 5.37, p = .02$ , showing that across all participants positive emotion word use decrease from Time 1 to Time 2 while negative emotion word use actually increased slightly across families. Simple



main effect tests indicate that emotion word use was higher than negative emotion word use at both time points.

Overall, these analyses indicate that there is minimal similarity in the way emotion language is used by family members, especially for positive words. Mothers used the most emotion language within the family while children used the least. All family members used more positive than negative emotion words, though the discrepancy between the two categories decreased some between Times 1 and 2.

Another approach to looking at similarities in the way children and parents use emotion language is to run correlational analyses. Table 12 shows the correlations between each family member's use of positive and negative emotion words in the natural setting. At Time 1, the children's use of both positive emotion words and negative emotion words was significantly correlated with the mother's use of each. Children's use of positive and negative emotion words did not correlate significantly with use by the father. Additionally, a marginally significant relation emerged between the mother and father on the use of positive emotion words, but no significant correlation was found for their use of negative emotion words. At Time 2, no significant relationships were found between any of the family members for either positive or negative emotion word use.

However, when broken down by child gender, more significant correlations were found. At Time 1, girls and mother showed positive correlations for positive and negative emotion word use and girls and fathers showed a positive correlation for positive emotion word use. Additionally, at Time 2, sons' use of positive emotion language was negatively correlated with both mothers' and fathers' use. However, the number of boys is especially small so these results should be interpreted with caution.

Table 13

*Correlations for Use of Emotion Words Between Dyads in Natural Setting*

	All Children T1	All Children T2	Girls T1	Girls T2	Boys T1	Boys T2
Child-Mother Positive Emotion	.35*	.04	.63**	.35	-.21	-.48+
Child-Mother Negative Emotion	.34*	.01	.45*	.01	.17	-.05
Child-Father Positive Emotion	.24	.08	.46*	-.28	-.19	-.53*
Child-Father Negative Emotion	.02	.25	.06	.20	-.06	-.23
Father-Mother Positive Emotion	.30+	.00	n/a	n/a	n/a	n/a
Father-Mother Negative Emotion	.15	.07	n/a	n/a	n/a	n/a

Note: +  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ ,  $df = 34$

*Part 2. How much do children and parents match on emotion language use?* One problem with a correlational procedure is that it is comparing relative word use across the 35 families and obscures relative word use on a family-by-family basis. An alternative way to look at the relative use of language between pairs of people is to employ Language Style Matching (LSM) analyses to calculate the relative use of positive and negative emotions between pairs of people. This approach allows further analysis of how family members use emotion language like or dislike other family members.

Table 13 displays the mean LSM scores for positive and negative emotion words across family member pairs. A 2 (Time: T1 vs. T2) x 2 (valence: positive vs. negative emotion words) x 2 (child gender: girls vs. boys) 3 (pair: child-father vs. child-mother vs. father-mother) repeated measures ANOVA was conducted to look for differences in LSM scores. There was a significant main effect of valence,  $F(1,30) = 17.12$ ,  $p < .01$ , indicating that LSM scores were higher for positive emotion words than negative emotion words but not for time, child gender, or pair. Also, a significant time x pair interaction was found,  $F(2,60) = 4.74$ ,  $p < .05$ . The nature of this interaction is depicted in Figure 3. Follow up

tests of simple main effects indicate that LSM scores were similar across time for child-mother and mother-father pairs but that child-father pairs did more matching at Time 2.

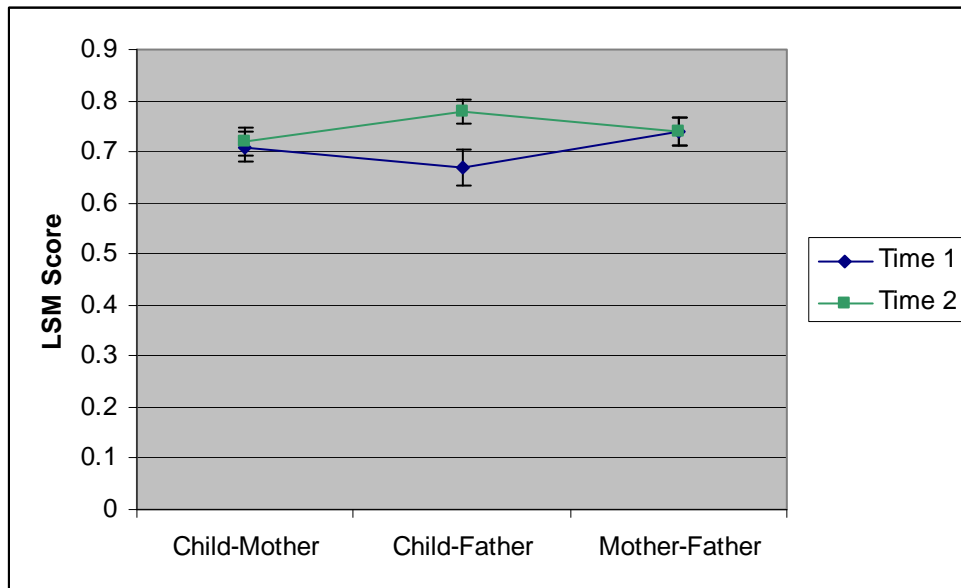
Table 14

*Mean LSM Scores for Positive and Negative Emotion Words Between Dyads in Natural Setting*

	All Children T1	All Children T2	Girls T1	Girls T2	Boys T1	Boys T2
Child-Mother Positive Emotion	.74	.76	.78	.80	.67	.71
Child-Mother Negative Emotion	.66	.64	.64	.62	.70	.66
Child-Father Positive Emotion	.73	.80	.79	.83	.65	.77
Child-Father Negative Emotion	.62	.76	.69	.81	.68	.71
Father-Mother Positive Emotion	.82	.80	n/a	n/a	n/a	n/a
Father-Mother Negative Emotion	.65	.67	n/a	n/a	n/a	n/a

Values reflect degree of Linguistic Style Match (LSM) between all possible family member pairs for both positive and negative emotion word use. Higher values indicate more matching.

Figure 3. Illustration of the time by pair interaction for LSM scores computed between dyads from natural interactions



*Summary.* Mothers used the most emotion words in both Times 1 and 2, followed by fathers and then children. However, both parents decreased in emotion word use from Time 1 to Time 2 while the children increased their emotion word use. The overall pattern, though, indicates that family units used less positive and more negative emotion language at Time 2 than Time 1.

At Time 1, children and mothers showed moderate levels of correspondence in their positive and negative emotion language use, though this effect was not present at Time 2. Children-father dyads showed negligible correspondence in either type of emotion word use at both times. However, when differentiated by child gender, daughters showed higher positive correspondence with parents and sons higher negative correspondence. Language Style Matching scores did not vary by child gender, but scores for children and fathers increased from Time 1 to Time 2 while mother-child scores remained constant.

*Question 3: How is emotion language use related to emotional functioning?*

*Part 1. Do parent emotion-oriented variables relate to parents' emotion language use?* In terms of emotional experience variables (Positive Affect, Negative Affect, and Depression), few significant findings appeared. For mothers, more Positive Affect was significantly and positively correlated with use of negative emotion words at Time 2 while more Negative Affect was marginally negatively related to use of positive words at Time 1. For fathers, greater a level of Depression was significantly related to fewer negative emotion words being used. Parent ratings of their emotion regulation strategies (Reappraisal and Suppression) were also uncorrelated with use of emotion language at both times. However, given the large number of correlations conducted for Table 15, it is likely that the few significant ones were due to chance.

Table 15

*Correlation of Parent Emotion-Oriented Variables with Parents' Emotion Language Use*

	Mother T1	Mother T1	Mother T2	Mother T2	Father T1	Father T1	Father T2	Father T2
	Positive Emotion Words	Negative Emotion Words	Positive Emotion Words	Negative Emotion Words	Positive Emotion Words	Negative Emotion Words	Positive Emotion Words	Negative Emotion Words
<i>Positive Affect</i>	-.01	-.02	.05	.38*	.21	-.09	.02	-.16
<i>Negative Affect</i>	-.31+	.00	-.26	.14	-.09	-.03	-.17	.25
<i>Depression</i>	-.04	.12	-.15	.07	-.27	-.36*	-.13	.04
<i>Reappraisal</i>	.24	-.02	.28	.04	-.21	-.04	-.02	-.15
<i>Suppression</i>	.00	.22	-.05	.09	-.07	-.07	-.04	-.22

Note: + p<.10, \* p<.05, \*\* p<.01, dfs range from 31 to 34

*Part 2. Do parent ratings of child emotion-oriented variables relate to children's emotion language use?* Not many significant correlations were found between parents' ratings of children's emotion regulation variables (Negativity and Emotion Regulation)

and children's use of emotion language. The only marginal hint of a relationship was for mothers who rated their children as having less Negativity having children who used fewer positive emotion words.

For the temperament variables (Surgency, Negative Emotionality, and Effortful Control), Effortful Control was most related to emotion language use by children.

Specifically, children whose parents rated them as showing more of this trait used more negative emotion words at Time 1. Additionally, children rated by their mothers as showing more Surgency (impulsiveness, activity level, etc) at Time 1 used marginally more negative emotion language. A similar trend existed for fathers but did not reach marginal significance. Again, these results should be interpreted with caution given the large number of correlation analyses conducted. Though, the consistency in the finding between mothers and fathers on Effortful Control lends it more strength.

*Part 3. Are parent ratings of children's problem behaviors related to children's emotion language use?* One of the most important questions regarding children's emotion language use is whether it is related to children's problem behaviors. Internalizing and externalizing behaviors act as a benchmark of a child's social competence and functioning. Internalizing problems are internally-oriented and include behaviors such as sadness and anxiety. Externalizing problems are outwardly-oriented and include behaviors such as aggression and delinquency. Table 17 shows the correlations between the average of the mother's and father's ratings of their child on these behaviors on the Child Behaviors Checklist and the child's use of naturally occurring emotion language.

Table 16

*Correlation of Parent Ratings of Children's Emotion-Oriented Variables with Children's Emotion Language Use*

	Child T1 Positive Emotion Words	Child T1 Negative Emotion Words	Child T2 Positive Emotion Words	Child T2 Negative Emotion Words
Mother				
<i>Negativity</i>	-.11	-.12	-.29+	.23
<i>Emotion Regulation</i>	.10	.16	.16	.04
<i>Surgency</i>	-.02	.10	-.13	.28+
<i>Negative Emotionality</i>	-.10	.22	-.03	-.02
<i>Effortful Control</i>	.08	.34*	.16	-.12
Father				
<i>Negativity</i>	-.23	-.08	-.23	.12
<i>Emotion Regulation</i>	.17	.16	-.03	.07
<i>Surgency</i>	-.11	.07	-.28	.22
<i>Negative Emotionality</i>	-.10	-.13	-.01	-.01
<i>Effortful Control</i>	.13	.34*	.12	-.08

Note: +  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ , df range from 33 to 34

At Time 1, the child's use of emotion words did not relate to the parents' ratings. However, at Time 2, children's naturally occurring use of negative emotion language was positive correlated with parents' ratings of Externalizing behavior. Additionally, there is a weak trend on the opposite direction with this same problematic behavior for positive emotion word use by the child. The Attentional Problems subscale from the CBCL also provided unique information about a child's ability to focus their attention on specific tasks (see correlations in Table 17) so ratings by each parents were included separately. Mother ratings of Attentional Problems were related to children using more positive

emotion language at Time 1. And father ratings of Attentional Problems were related to children using less positive emotion language at Time 2.

Table 17

*Correlations Between Children's Emotion Language Use and Parents' CBCL Ratings*

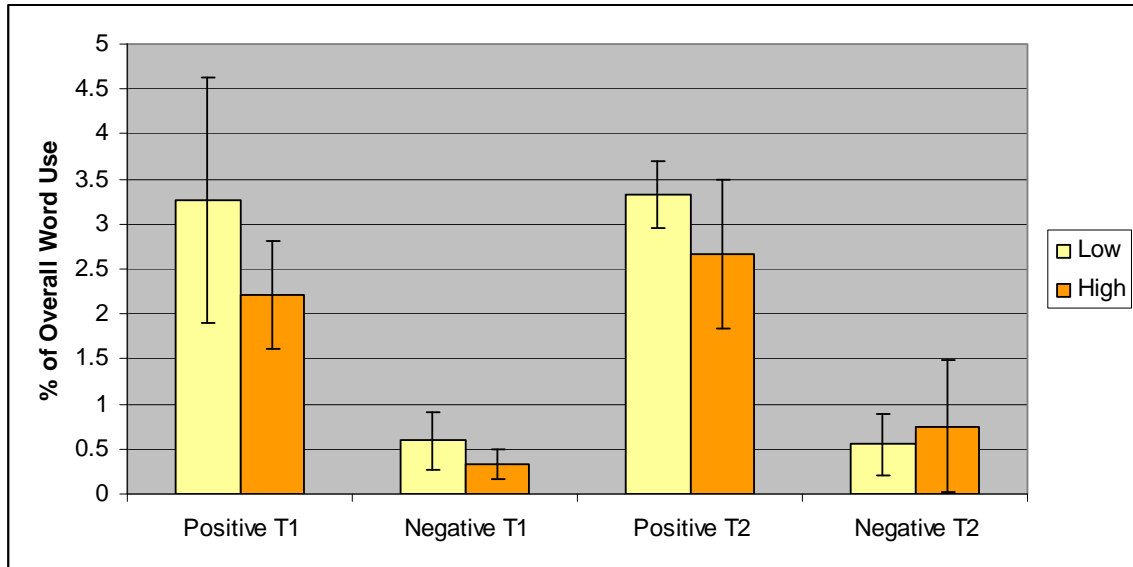
	Mother-Father INT	Mother-Father EXT	Mother Attn Problems	Father Attn Problems
Time 1				
<i>Positive Emotion</i>	-.17	-.22	.42*	-.12
<i>Negative Emotion</i>	-.12	.01	.24	.18
Time 2				
<i>Positive Emotion</i>	.14	-.24	-.01	-.42*
<i>Negative Emotion</i>	-.14	.39*	-.05	.10

Note: +  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ ;  $df = 31$ ; Internalizing (INT) and Externalizing (EXT) scores are averages of the mother and father ratings for each child.

Another approach to examining whether children with internalizing or externalizing problems use emotion language differently is via MANOVA analyses with the top and bottom quartile of scores on each measure. For internalizing behavior, no differences for any kind of emotion language use at either time were found,  $F(4,11) = 1.02, n.s.$ . For externalizing behavior, marginally significant differences did emerge,  $F(4,11) = 2.62, p = .09$ . The means for each language variable are displayed in Figure 4. Children with low levels of externalizing behavior tended to use more positive emotion language at both times while children with high levels used slightly more negative emotion language at Time 2.



Figure 4. Use of emotion language by children with low and high levels of externalizing behavior.



*Part 4. Are children's emotional behaviors related to their use of emotion language?* To answer this question, correlational analyses were conducted between naturally occurring emotion language use and the emotion behaviors coded with the SECSI at both Times 1 and 2 (see Table 18). Children's use of emotion words at Time 1 was not significantly related to any of the emotion behaviors at either time. There was a marginally significant negative correlation between singing and use of negative emotion word use. Negative emotion word use at Time 2 was positively correlated with the amount of crying a child engaged in at both Times 1 and 2. Positive emotion word use also tended to be negatively correlated with crying and whining and both Times 1 and 2.

*Part 5. Is children's emotional understanding related to their use of emotion language?* The final question related to emotional functioning for children is whether a

child's level of emotional understanding is related to the child's use of emotion language. Emotional understanding is comprised of four types of knowledge: expressive, receptive, situational, and non-stereotypical situation. Again, correlational analyses were conducted to address this question (see Table 19). Time 1 use of negative emotion language by a child was related to more receptive knowledge at time 2.

Table 18

*Correlation of Children's Emotion Language Use with Their Emotion Behaviors*

	T1 Laugh	T1 Sing	T1 Cry	T1 Whine	T2 Laugh	T2 Sing	T2 Cry	T2 Whine
Time 1								
<i>Positive Emotion</i>	-.05	.19	-.25	-.27	-.07	.15	-.02	-.22
<i>Negative Emotion</i>	-.04	-.26	.01	-.10	.22	-.31+	.04	-.15
Time 2								
<i>Positive Emotion</i>	-.14	.09	-.22	-.26	-.01	-.05	-.28+	-.28
<i>Negative Emotion</i>	-.18	-.22	.35*	.22	-.06	-.10	.43**	.02

Note: +  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ ,  $df = 34$

Table 19

*Correlation of Children's Emotional Understanding with Emotion Language Use*

	Expressive Knowledge	Receptive Knowledge	Situational Knowledge	Situational Knowledge (non- stereotypical)
Time 1				
<i>Positive Emotion</i>	-.07	.11	.28	.11
<i>Negative Emotion</i>	.06	.30+	.22	.28
Time 2				
<i>Positive Emotion</i>	-.28	.09	.14	-.15
<i>Negative Emotion</i>	-.16	.09	-.02	-.18

Note: +  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ ,  $df = 34$

*Summary.* For parents, Positive and Negative Affect and Depression were related to emotion language use. Both mother and father ratings of Effortful Control related to children's emotion language use. Mother ratings of Negativity and Surgency were also marginally related. Parent ratings of externalizing ratings were positively correlated with negative word use at Time 2. Ratings of Attention Problems showed a mixed pattern where mother ratings were positively correlated with children's use of positive emotion words at Time 1 but father ratings were negatively correlated with positive emotion word use at Time 2. Children's use of negative emotion language at Time 2 was positively correlated with their crying behavior at both times. Finally, children's scores on the emotional understanding task were partially related to their use of emotion language.

*Question 4: How does emotion language in a lab setting compare to a natural setting?*

The final question of interest concerned whether family members use emotion language the same way in their daily interactions as they do in lab setting, or whether emotion language use is situation specific.

*Part 1. How frequently were emotion words used in the lab?* Children used an average total of 83.5 words in the lab storybook task above and beyond the text of the story. Of these, 2.5% were positive emotion words and 2.3% were negative emotion words. Mothers used an average of 219.1 total words, 4.5% positive and 2.1% negative, and fathers spoke an average of 191.5 total words, 4.1% positive and 1.7% negative, above and beyond the storybook text. This means that parents were using both more overall words and positive emotion words than the children during the reading interactions.

*Part 2. Are positive and negative emotion words used in similar ways in the lab?* Again correlation analyses were run to see what pattern, if any, exists between a person's use of positive and negative emotion words in the lab task (see Table 20). There was a non-significant trend for mothers to use inverse amounts of positive and negative emotion words. In other words, mothers who used high levels of positive emotion words used very few negative emotion words, and vice versa. However, the general pattern in the lab matched that of the natural setting by showing a lack of correspondence in type of emotion word use within person. In other words, use of positive and negative emotion language by a person is generally unrelated.

Table 20

*Correlations of Positive and Negative Emotion Word Use Within Person in the Lab Setting*

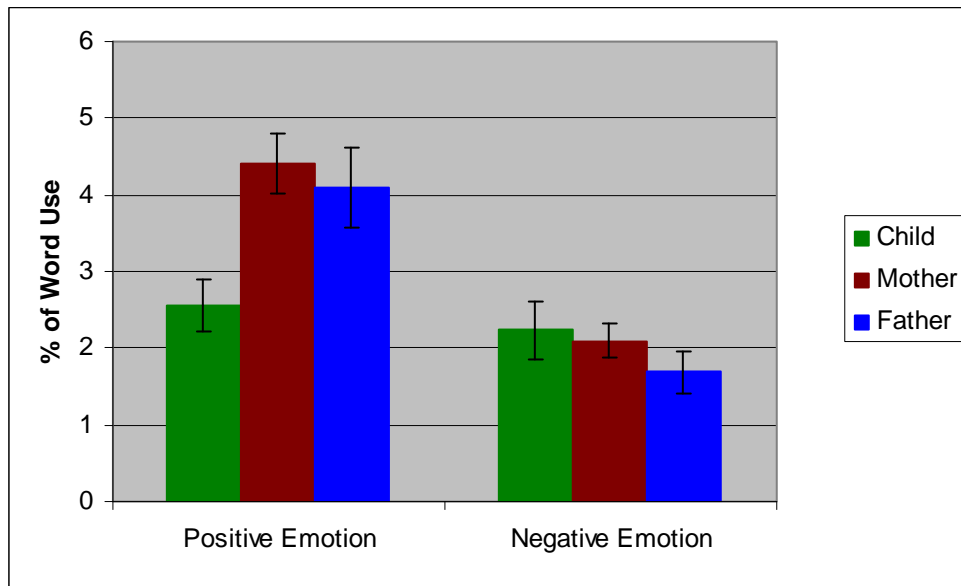
	Child	Mother	Father
Lab Setting	-.08	-.25	.01

*Note:* +  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ , dfs range from 31 to 32

*Part 3. Do children and parents use emotion language similarly in the lab?*

A 3 (person: child vs. mother vs. father) x 2 (valence: positive vs. negative) repeated measures ANOVA was conducted to look for person differences in emotion language use in the lab setting. There were significant main effects of person,  $F(2,29) = 4.11, p = .02$ , and valence,  $F(1,30) = 26.22, p < .01$ . Additionally, a significant person x valence interaction emerged,  $F(2,62) = 5.75, p = .01$ , as depicted in Figure 5. Follow up tests of simple main effects show that mother and fathers did not differ in their use of positive emotion but that they both used more than the child in the reading task. There were no person differences in use of negative emotion.

*Figure 5.* Illustration of the person by valence interaction for emotion language use in the lab setting



Again, both correlation and LSM analyses were conducted to see whether children and parents used emotion language similarly in the lab setting (see Table 21). As in the natural setting, children's use of positive emotion words was not significantly correlated to mothers' or fathers' use of positive emotion words. The child's use of negative emotion words in the lab was moderately correlated with the mother's use of negative emotion words but did not correlate with the fathers' negative emotion word use. Again, there was no relation between the mothers' use and the fathers' use of either positive or negative emotion words in the lab setting.

Table 21

*Child-Parent Similarities in Emotion Language Use in the Lab Setting*

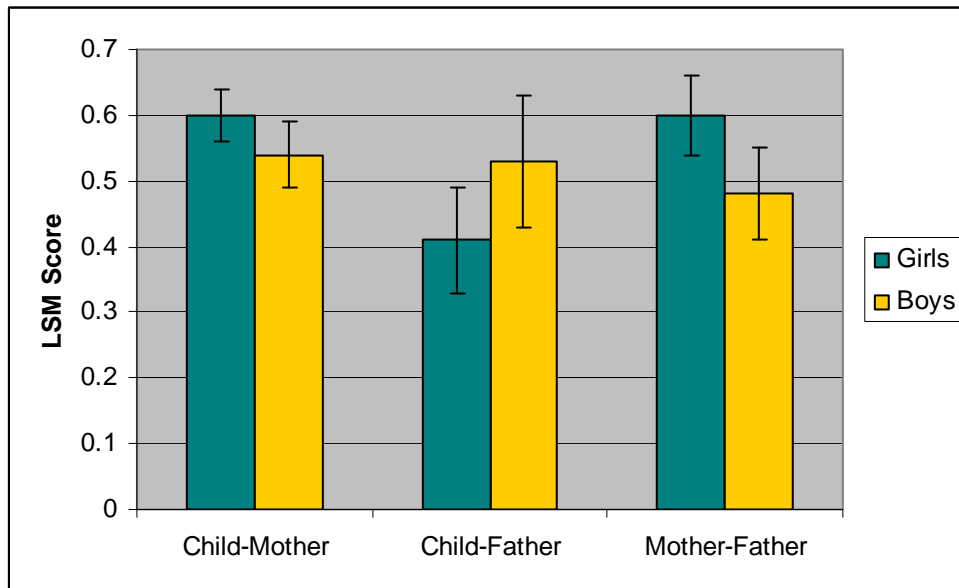
	All Children LIWC Corres	All Children LSM Scores	Girls LIWC Corrs	Girls LSM Scores	Boys LIWC Corrs	Boys LSM Scores
Child-Mother Positive Emotion	.15	.50	.35	.55	.18	.44
Child-Mother Negative Emotion	.30+	.56	.23	.65	.36	.43
Child-Father Positive Emotion	.11	.52	-.18	.42	.29	.65
Child-Father Negative Emotion	.23	.49	-.02	.41	.52+	.61
Father-Mother Positive Emotion	.20	.70	n/a	n/a	n/a	n/a
Father-Mother Negative Emotion	-.08	.48	n/a	n/a	n/a	n/a

Note: +  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$  for the correlation analyses done with LIWC values, dfs range= 31 to 32

To examine the LSM scores, a 2 (valence: positive vs. negative emotion words) x 2 (child gender: girls vs. boys) x 3 (pair: child-father vs. child-mother vs. father-mother) repeated measures ANOVA was conducted. No main effect was significant but the pair x child gender was,  $F(2,60) = 4.84, p = .01$  (see Figure 6). The valence x pair interaction was marginally significant,  $F(2,60) = 2.77, p = .07$ . The trend indicates that when it comes to

language style matching, mothers match more with daughters and fathers match more with sons.

*Figure 6.* Illustration of the pair by gender interaction for emotion language use in the lab setting



*Part 4. How did emotion language use in the lab related to use in the natural setting?* Because much of what is known about emotion language use by children and parents comes from lab data, it is important to know if this lab data is analogous to what would be found if researchers collected naturally occurring emotion language.

To examine whether emotion language was used differently in natural settings and in the lab, a 3 (setting: T1 natural vs. T2 natural vs. lab) x 3 (person: child vs. mother vs. father) x 2 (valence: positive vs. negative) repeated measures ANOVA was conducted. Significant main effects emerged for setting,  $F(2, 58) = 11.64, p < .01$ , person,  $F(2, 58) = 12.97, p < .01$ , and valence,  $F(1, 29) = 280.91, p < .01$ . However, the setting x valence,  $F(2, 58) = 13.32, p < .01$ , and person x valence,  $F(2, 58) = 14.64, p <$

.01, interactions were also significant. Figures 7 and 8 depict the nature of these interactions.

Figure 7. Illustration of the setting by valence interaction for emotion language use across settings

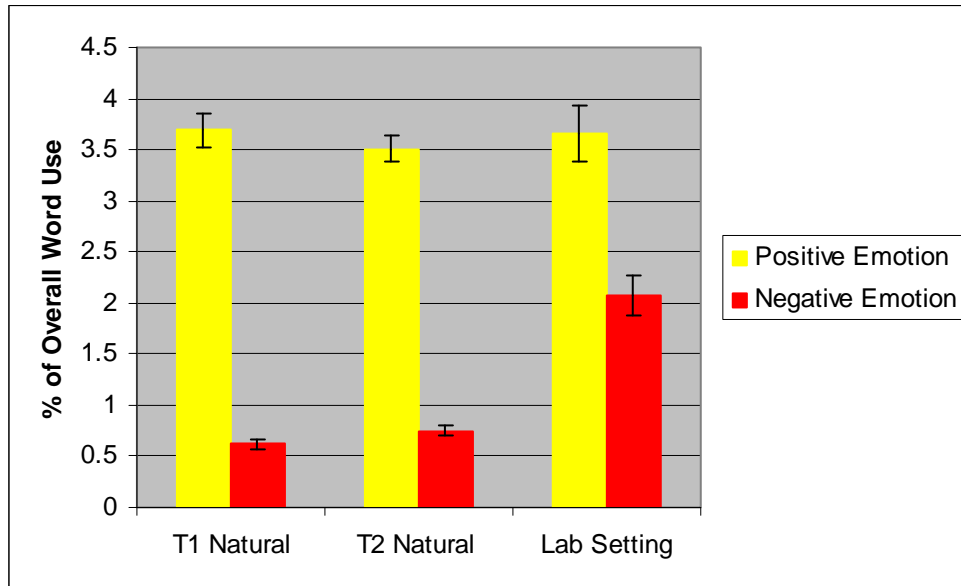
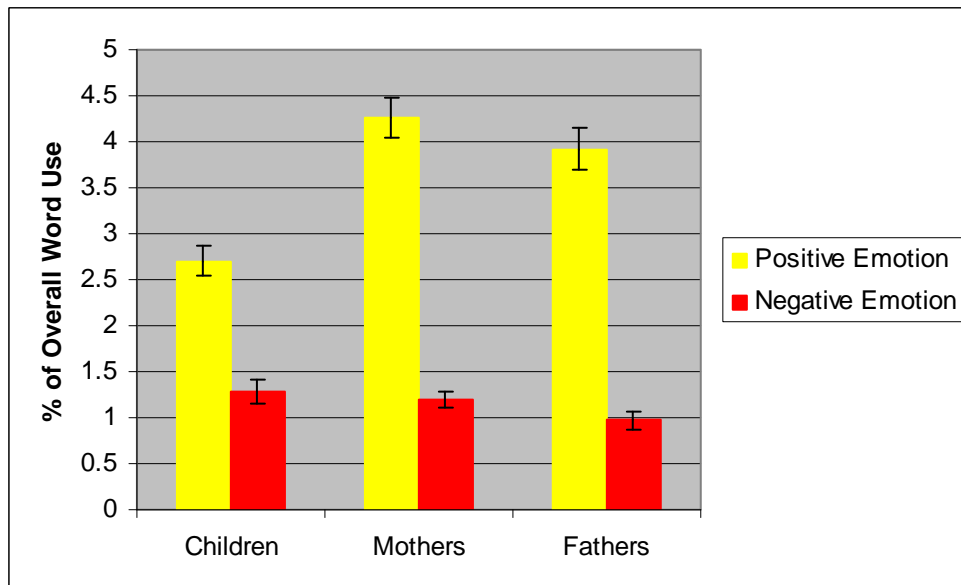


Figure 8. Illustration of the person by valence interaction for emotion language use across settings





The rates of positive use by children, mothers, and fathers did not differ between the lab task and natural interactions from Times 1 and 2, though parents used more positive emotion words when the data were collapsed across the three settings. However, negative emotion word use was higher in the lab setting than in the natural settings among both children and parents.

Correlation analyses were also conducted to address this question (see Table 22). Results indicate that emotion language use in naturally occurring interactions is generally unrelated to emotion language use in the lab for the child, mother, and father. One exception is for mothers, who showed a marginally significant relationship between their use of positive emotion word use between the natural setting at Time 1 and the lab and another marginally significant relationship for use of negative emotion language in the natural setting from Time 2 and the lab task. Overall, these results indicate that emotion language use by children and parents functions differently in natural and lab settings.

Table 22

<i>Correlations for Emotion Word Use in the Lab Versus Natural Settings</i>			
	Child	Mother	Father
T1 Lab-T1 Natural			
<i>Positive Emotion</i>	.21	.30+	-.01
<i>Negative Emotion</i>	.00	.05	-.11
T1 Lab-T2 Natural			
<i>Positive Emotion</i>	.08	.16	-.06
<i>Negative Emotion</i>	-.20	.31+	.07

Note: +  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ , dfs range from 31 to 32

*Summary.* Rates of negative emotion word use were higher in the lab setting than in the natural setting. Though, overall positive emotion words were used at higher rates than negative emotion words. Also, children used more negative emotion words and less positive emotion words than parents in this paradigm. Again, there was a general pattern of lack of a correlation between use of positive and negative emotion words use within participants during the reading task. In terms of correspondence, children and parents did not use similar amounts of emotion language. Additionally, the LSM scores in the reading task were low, indicating a general lack of matching in emotion language. A trend indicating that mothers matched more with daughters while fathers matched more with sons was seen. Finally, comparison of emotion language use in the lab versus the natural settings revealed minimal correspondence for mothers and no correspondence for children or fathers, indicating that participants are using language in different ways in the differing contexts.

### Other Relevant Data

#### *Part 1. Does family SES relate to children's use of emotion language?*

Surprisingly, family SES (as assessed by annual income) was not significantly related to emotion language use by children at either Time 1 or Time 2. It was expected that family SES would be related to emotion word use because higher SES is generally related to education and parenting approaches.

Table 23

#### *Correlation of Family SES, Child Age, and Child Verbal Ability with Children's Emotion Language Use*

	Child T1 Positive Emotion Words	Child T1 Negative Emotion Words	Child T2 Positive Emotion Words	Child T2 Negative Emotion Words
Family SES	.13	.26	-.16	.02
Child Age	.36*	.14	.36*	-.01
Child PPVT	.18	.19	.12	-.11

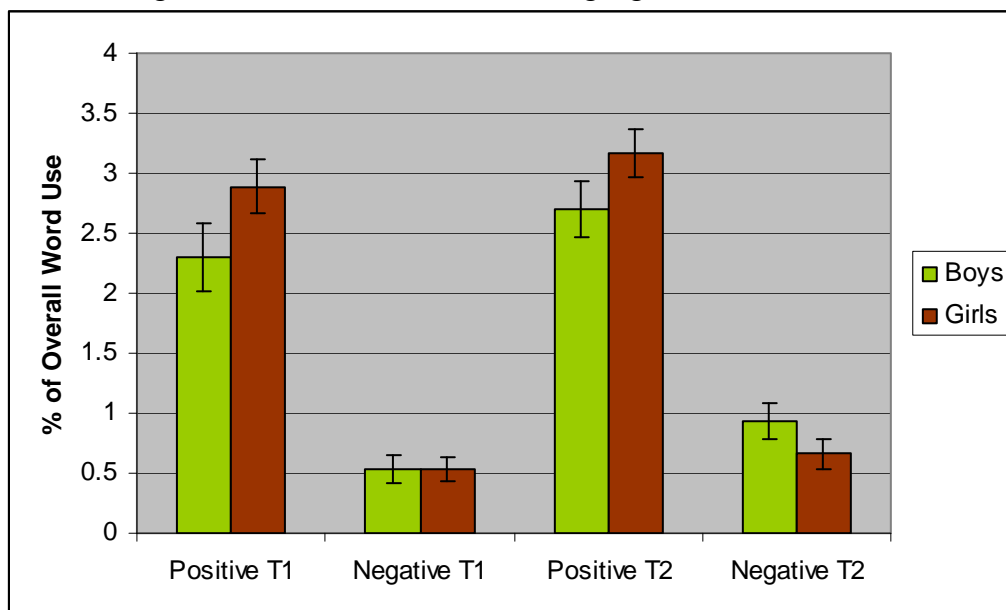
Note: +  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ ,  $df = 34$

*Part 2. Does child age relate to use of emotion language?* Child age was significantly and positively correlated with use of positive emotion language at both Times 1 and 2. On the other hand, negative emotion language use was unrelated to age at both times. This indicates that positive word use increases with age while negative word use remains more constant during this age period.

*Part 3. Does children's verbal ability relate to use of emotion language?* A child's general verbal ability was entirely unrelated to emotion language use at Times 1 and 2. Again, this was surprising because it would be expected that knowing more words would result in the use of more words, such as emotion words.

*Part 4: Does child gender relate to emotion language use?* To explore whether boys and girls use emotion language differently in their daily lives, a MANOVA was conducted with the positive and negative rates at Times 1 and 2. The overall MANOVA was not significant,  $F(4,30) = 1.92, p=.13$ , but the pattern of means show an interesting pattern that may have been significant with more power, see Figure 9. At both Times 1 and 2, girls used more positive emotion words than boys. For negative emotion words, though, girls and boys used the same amount at Time 1 and boys tended towards using more at Time 2.

Figure 9. Child gender differences in emotion language use



*Part 5. Do parent emotion-oriented variables relate to children's use of emotion language?* Parent scores on emotion-oriented variables were most related children's use of negative emotion language at both Times 1 and 2, especially mother scores. At Time 1, mothers who experienced more trait Negative Affect and engaged in less Reappraisal as an emotion regulation strategy had children who used more negative emotion words.

Conversely, fathers who used less Suppression as a regulation strategy had children who used more negative emotion language. Both mothers and fathers who reported lower levels of Depression at Time 1 had children who used less negative emotion language at Time 2. It is unclear why this association would work in the direction it does as it may have been expected that parents Depression would be related to more use of negative emotion words by children.

Table 24

*Correlation of Parent Emotion-Oriented Variables with Children's Emotion Language Use*

	Child T1 Positive Emotion Words	Child T1 Negative Emotion Words	Child T2 Positive Emotion Words	Child T2 Negative Emotion Words
Mother				
<i>Positive Affect</i>	.04	-.09	.03	.06
<i>Negative Affect</i>	.06	.34*	.34*	.26
<i>Depression</i>	-.08	.06	-.11	-.36*
<i>Reappraisal</i>	.16	-.30*	.12	.08
<i>Suppression</i>	.03	.02	.16	-.13
Father				
<i>Positive Affect</i>	.27+	-.03	-.10	-.06
<i>Negative Affect</i>	-.02	-.15	.04	.05
<i>Depression</i>	-.25	-.12	-.16	-.40*
<i>Reappraisal</i>	-.12	-.04	.12	.15
<i>Suppression</i>	-.04	-.44**	.12	-.25

Note: +  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ , dfs range from 31 to 34

*Summary.* Children's use of emotion language was not related to either family SES or child's general verbal ability. Positive but not negative emotion word use was related to child age. Girls tended to use more positive emotion words than boys at both times. The parent emotion-oriented variables that related to children's emotion language use were Negative Affect, Depression, and Reappraisal for mothers and Depression and Suppression for fathers.

## Discussion

There were four goals for this dissertation: to investigate how children use emotion language in ecologically valid settings, to assess the degree of correspondence between children and parents' emotion language use, to explore what emotion language use means about emotional health, and to test the ecological validity of lab-based measurements of emotion language. The data collected from natural and laboratory settings has provided new insights into these questions. As was discussed above, the emotion words that were measured in this project included both pure emotion words (i.e., happy) and more evaluative terms (i.e., good). The inclusion of evaluative terms is not usual in emotion language research but they have been included here because they reflect broad emotional states, or moods.

The discussion will be directed first to descriptive insights into emotion language use in naturally occurring interactions. Then the similarity in emotion language use by children and parents will be covered, with special attention being paid to child gender as an important variable. Next, evidence supporting the reflection and regulation models of emotion language will be reviewed. Finally, implications for the ecological validity of measuring emotion language use in the lab will be discussed.

### *Real World Emotion Language Use by Children and Parents*

The first question was aimed at gathering descriptive information about how children and parents use emotion language in their daily lives to start a foundation of empirical knowledge. Surprisingly, both children and parents rarely used negative emotion words in their naturally occurring interactions: the percentage of overall negative word use ranged from 0.5% to 0.8%. This rate is much lower than has been found in

previous work using the EAR, where rates of negative emotion words among both college samples (Mehl & Pennebaker, 2003) and middle aged adults were 1.4% negative (Baddeley, 2008). Parents of preschoolers using less negative emotion than other adult groups is surprising given the dynamic emotional lives of children this age (marked by emotional ups and downs and only minimal self-regulation) and the stress of the job of teaching children society's rules, which often are at odds with the child's own desires. Regardless of the reason, it is important to interpret results with the low base rate in mind.

Three other descriptive findings were particularly noteworthy: the differences in rates of emotion language use between specific family members, the relation of positive and negative emotion words on the within person level, and stability of emotion language use over a 12 month interval. At both observation times mothers used the most positive emotion words, followed by fathers and then children, in line with gendered cultural stereotypes regarding expression of positive emotion (Stoppard & Gruchy, 1993), though other empirical work has not provided full support of this stereotype (e.g., Newman, Groom, Handelman, & Pennebaker, 2008). Additionally, it was found that positive and negative emotion word use is not related on the within person level. That is, if a family member uses high levels of positive emotion language in naturally occurring language it does not impact whether he/she uses high or low levels of negative emotion, supporting previous work suggesting that positive and negative emotion function independently of each other (Diener & Emmons, 1984; Watson & Tellegen, 1985). Finally, positive emotion word use showed some stability over the one year interval, especially for parents, while negative emotion word use was not stable across time, raising the question



of whether variability in negative emotion language may be because negative affect is more situationally specific than positive affect.

#### *Child-Parent Correspondence in Emotion Language Use*

The second main question addressed how child and parent emotion language use is related. Emotion language use by a single person does not exist in a vacuum. In the case of these participants, it exists within the context of a family unit. Social learning theorists would have predicted a high degree of agreement between children and their parents on emotion language rates based on processes such as modeling (Bandura, 1977) and imitation (Arbib, 2002). However, this was only weakly supported. As mentioned above, children used lower levels of positive emotion words than parents. Also, correlational analyses indicated moderate levels of emotion word correspondence between children and their mothers, but little between children and fathers. Overall, these analyses indicate unexpectedly low levels of correspondence with regard to emotion language use between children and parents.

However, further inspection indicated that correspondence in emotion language use is likely a function of child gender. When the data were separated based on gender, a clearer picture appeared that is consistent with ideas suggesting gendered emotion socialization begins very early in life (Brody, 1985; 1999; Leaper & Bigler, 2004). In their naturally occurring interactions, daughters and parents used similar rates of positive and negative emotion words. While this data is collapsed across the entire day and not conversation by conversation, the following excerpt of mother-child conversation from the transcript of a 56 month old girl illustrates this point:

Child: Daddy wasn't *angry*, but you were *angry* about taking this upstairs, and not

Daddy.

Mother: Well that's because because I have to clean it up, and when Daddy gets home he gets *upset* with me that I let you all eat up here, and so, like right now I'm having to clean up Axxx.

Child: Yeah, but...

Mother: And it's not it's not...

Child: But now I am big and don't do it anymore.

On the other hand, sons and parents use of emotion words was somewhat negatively correlated. So, for example, when boys are talking about negative emotion the parents are not. However, the number of boys in the sample is very low and this finding should be considered with caution.

#### *Reflection vs. Regulation Models of Emotion Language Use*

The third aim was to look at relations between emotional language use and emotional health. Two possible models to explain the relation were initially proposed. First, the reflection model, which posits emotion language use to simply reflect emotionality and, second, the regulation model which posits that emotion language use acts as an emotion regulation technique. The support for each given by the child and parent variables measured in the study will be addressed below.

Many of the children's emotion-oriented and behavioral variables indicated that emotion language reflects emotionality. First, mother ratings of child negativity (dysregulated mood) and surgency (impulsivity and intense pleasure seeking) at Time 1 were moderately negatively correlated with positive emotion word use at Time 2 and positively correlated with negative emotion word use at Time 2. Second, parent ratings

of externalizing behavior problems were positively correlated with use of negative emotion words at Time 2. When the children with the lowest and highest rates of internalizing and externalizing problem behaviors were directly compared few differences in their use of positive and negative emotion language emerged. The only pattern worth noting is that children with the lowest level of externalizing behavior did tend to use more positive emotion language at both times than children with the highest levels. Finally, regarding emotion behaviors, children who cried less at Times 1 and 2 used fewer negative emotion words at Time 2. Additionally, children who cried less at Time 2 use marginally more positive emotion words. Again this is initial evidence that emotion words reflect emotion experience.

Less clear evidence for the reflection model emerged from the parent data of emotion-oriented variables. Parents' emotion language use was inconsistently related to their self-reported ratings of emotionality and depression. A trend existed indicating that mothers higher in negative affect used fewer positive emotion words at Time 1, which would be in line with the reflection model. Unexpectedly, though, mothers high in positive affect also used more negative emotion words at Time 2. This pattern is opposite of what one would predict based on the reflection model. Additionally, fathers who had higher depression scores used significantly less negative emotion language at Time 1, also in contradiction to what the reflection model would predict.

The strongest evidence for the regulation model is that children who used more negative emotion language were rated by both parents as having more effortful control, or the ability to suppress a dominant response and perform a subdominant response (e.g., Rothbart, 2004). This is essentially a basic form of self-regulation, so children who are

using more negative emotion language are seen as better self-regulators by their parents. Indeed, past research has linked children's effortful control to better emotion regulation (see Eisenberg, Smith, Sadovsky, & Spinrad, 2004).

No evidence for the regulation model came from the parent data because no significant correlations were found between parents' ratings of their specific regulation techniques and their emotion use. However, a trend was found indicating that mothers who use more reappraisal also use more positive (but not negative) emotion language.

Taken together, the patterns of relations between emotion language use and emotion functioning in children provide more evidence for the reflection model than for the regulation model. This indicates that emotion language use provides an indication of an individual's emotional experience. Again, though, given the large number of correlational analyses conducted for this question, the correlations referred to here may be significant or marginally significant as the result of Type I Error.

#### *The Ecological Validity of Measuring Emotion Language Use in Labs*

The final goal was a methodological one: to assess how consistent emotion language use in lab settings is with emotion language use in a natural setting. Results suggest that previously used lab-based techniques may not capture emotion language use as it would happen in a natural setting. The correlations between emotion language use in the lab and natural setting were generally not significant, indicating that people use emotion words differently in different contexts. This was particularly true for negative emotion words. With a larger sample, the correlations for positive word use between the lab and natural setting may have reached significance. But this is not the case for negative emotion word use. This points to the need to recognize the context specific

nature of negative emotion language, at the very least. The implication for research within the realm of emotion language, particularly in parent-child interactions, is that more needs to be done with naturalistic methodologies to understand real world phenomena. This is not necessarily implying that studying emotion language in the lab is invalid but that the two approaches can work in concert with one another to provide different information about how emotion language functions.

### *Secondary Analyses*

Additional analyses beyond the four main questions revealed several interesting and noteworthy findings. First, the three individual difference variables assessed here provided little help in elucidating what type of emotion language children use. Children's emotion language use was unrelated to family SES (as assessed by annual family income) and child verbal ability. The lack of a correlation between annual income and child emotion language use was unexpected because it was thought that higher SES, reflecting higher parent education level, would be related to use of more emotion language by parents. Additionally, one would expect that children with better vocabulary skills would have larger emotion vocabularies. However, the lack of a relation between verbal ability and actual emotion language used could reflect the distinction between what a person CAN do and what he/she actually DOES do. So it is possible, for example, that children who have large emotion vocabularies may not actually use them and that children who only know a limited number of emotion words use them frequently.

Next, it was expected that child age would be strongly associated with children's emotion language use, but this was only partially supported. Older children did use more positive emotion words, but child age was not related to use of negative emotion words.

The use of more positive emotion words as children grow older is likely a reflection of growth of language skills. However, the fact that this trend was only found for positive emotion words indicates that the growth trajectory for the difference valences differs. It is possible that negative emotional states are more complex and challenging for children than positive ones so it may take longer for them to show much growth in negative word use. It is also possible that children learn and internalize social norms that positive emotion expressions are more socially acceptable than negative ones.

Gender also proved to be an important factor in understanding emotion language use for children. In general, girls used more positive emotion language than boys at both times and boys used more negative emotion language than girls at Time 2. This finding is in line with the cultural stereotype that females are encouraged to express positive emotion whereas boys are taught to express negative emotion (particularly anger) (Brody, 1999). Remembering that mothers also used more positive words than fathers, the fact that the gender difference emerges so early in life could reflect the extremely early gender socialization that happens in the realm of emotion (Eisenberg et al., 1998).

Interestingly, parents' self-reported mood scores were more related to children's use of emotion language than were parent ratings of child affect. Mothers who scored higher on negative affect had children who use more negative emotion language at Time 1. Unexpectedly, though, more maternal negative affect was also positively related to children's positive emotion language use at Time 2. The increase in both positive and negative emotion word use on the part of the children is difficult to account for and needs replication. Additionally, mother and father depression scores at Time 1 were negatively correlated with children's use of negative emotion words at Time 2. It would have been

expected that more depressive symptoms in parents would have been related to more, not less, negative emotion language on the part of the child. However, this does parallel the finding that depressed fathers use less negative emotion words. Given the inconsistent and confusing nature of these results, it is possible that they reached significant levels due to chance so should be interpreted with caution until replication is possible.

### *Limitations and Future Directions*

Despite the promising results of the current project, certain limitations need to be recognized. One weakness is the relatively small number of participants. A larger, more diverse sample is needed to get a more complete understanding of naturally occurring emotion language. The sample of language was also limited by the fact that only 150 30-second randomly selected sound segments were used. Being able to work from the complete transcripts would help alleviate this problem. From full transcripts, further and more complex questions can be addressed, such as 1) who initiates emotion language use in family interactions (children or parents)?; 2) do rates of emotion language fluctuate across the day; and 3) is emotion language used at times when emotional behaviors (e.g., crying and laughing) are occurring?

Other limitations include selectivity of the sample, inclusion of only one day of recording, and possible demand characteristics. On average, the families who consented to participate in this time-consuming study were mostly white and upper-middle class. This makes generalization to other ethnic/racial and SES groups difficult. Additionally, the children and parents were recorded on a single weekend day. Therefore it is unclear whether the same pattern of findings would be found on a week day, where there may be factors such as work stress that come into play. Also, having more than one day of

recordings would help to ensure the representativeness of the day's activities. Finally, because the recording took place on a single day, parents may have made some effort to behave "better." However, parents were asked during debriefing to rate how much they thought the recording changed their behaviors on a 5-point Likert scale (1=Behavior changed not at all, 5= Behavior changed a great deal) and they averaged 2.1, indicating only small amounts of behavior change in response to the methodology.

The current project has generated a rich dataset of naturalistic recordings that can be studied further, once they are fully transcribed and coded. In addition, this work has provided a pilot study for future naturalistic studies using digital recorder technology. Such studies, including larger, more diverse samples and increased recording period to multiple days (both weekday and weekend) will result in an even better data quality.

Future research should further investigate some of the questions this work has identified. Specifically, the issue of gender differences in parent and child emotion language should be further explored. It would be worthwhile to record even younger children, to see when the gender differences first appear. Additionally, while the reflection model of emotion language use received the most support from the data, the association between effortful control and emotion language use showed some evidence for the regulation model in children and merits further exploration. Finally, additional work should be conducted to replicate the finding that lab and natural settings result in differing emotion language use. If the discrepancy holds up in other samples, the implications for how emotion and emotion language research is conducted are considerable.



This work reflects an initial step in generating an ecologically valid understanding of emotion language use by preschool-aged children and their parents. This information will help researchers better understand both emotional development in children and emotional processes within family units. Additionally, as technology advances, new naturalistic methodologies are surfacing that allow researchers to explore psychological phenomenon in new and exciting ways. The digital recording device used here to capture real-world language and behaviors holds much promise for researchers in many areas of psychology.

## Appendix A

### *Questionnaire Measures*

#### Beck Depression Inventory (BDI)

On this questionnaire are groups of statements. Please read the entire group of statements for each question. Then pick out one statement in each group that best describes the way you have been feeling during the PAST WEEK, INCLUDING TODAY. Be sure to read all the statements in each group before making your choice. Circle the best statement in each group.

1.

- 0) I do not feel sad.
- 1) I feel blue or sad.
- 2) I am so sad or unhappy that it is quite painful.
- 3) I am so sad or unhappy that I can't stand it.

2.

- 0) I am not particularly pessimistic or discouraged about the future.
- 1) I feel discouraged about the future.
- 2) I feel I have nothing to look forward to.
- 3) I feel that the future is hopeless and that things cannot improve.

3.

- 0) I do not feel like a failure
- 1) I feel I have failed more than the average person.
- 2) As I look back on my life, all I can see is a lot of failures.
- 3) I feel I am a complete failure as a person.

4.

- 0) I am not particularly dissatisfied.
- 1) I feel bored most of the time.
- 2) I don't get satisfaction out of anything anymore.
- 3) I am dissatisfied with everything.

5.

- 0) I don't feel particularly guilty.
- 1) I feel bad or unworthy a good part of the time.
- 2) I feel quite guilty.
- 3) I feel as though I am very bad or worthless.

6.

- 0) I don't feel disappointed in myself.
- 1) I am disappointed in myself.
- 2) I am disgusted with myself.
- 3) I hate myself.

7.

- 0) I have not lost interest in other people.
- 1) I am less interested in other people than I used to be.

- 2) I have lost most of my interest in other people and have little feeling for them.
  - 3) I have lost all of my interest in other people and don't care about them at all.
- 8.
- 0) I make decisions as well as ever.
  - 1) I try to put off making decisions.
  - 2) I have great difficulty in making decisions.
  - 3) I can't make decisions at all anymore.
- 9.
- 0) I don't feel I look any worse than I used to.
  - 1) I am worried that I am looking unattractive or old.
  - 2) I feel that there are permanent changes in my appearance and they make me look unattractive.
  - 3) I feel that I am ugly or repulsive looking.
- 10.
- 0) I can work about as well as before.
  - 1) It takes extra effort to get started at doing something.
  - 2) I have to push myself very hard to do anything.
  - 3) I can't do any work at all.
- 11.
- 0) I don't get any more tired than usual.
  - 1) I get more tired than I used to.
  - 2) I get tired from doing anything.
  - 3) I get too tired to do anything.
- 12.
- 0) My appetite is no worse than usual.
  - 1) My appetite is not as good as it used to be.
  - 2) My appetite is much worse now.
  - 3) I have no appetite at all anymore.

Center for Epidemiologic Studies Depression Inventory – Short Form (CESD)

Below is a list of ways people might feel or behave. For each statement, please mark the answer that represents how often you have experienced the feeling, thought or behavior IN THE LAST WEEK.

Rarely or none of the time (less than one day)	Some or little of the time (1-2 days)	Occasionally or a moderate amount of time (3-4 days)	Most or all of the time (5-7 days)
0	1	2	3

1. I was bothered by things that usually don't bother me
2. I felt that I could not shake off the blues even with help from my family or friends
3. I felt that I was just as good as other people
4. I had trouble keeping my mind on what I was doing
5. I felt that everything I did was an effort
6. I felt hopeful about the future
7. I thought my life had been a failure
8. I felt fearful
9. I felt lonely
10. People were unfriendly

Positive and Negative Affect Schedule (PANAS)

This scale consists of a number of words that describe different feelings and emotions. Read each item and then circle the appropriate number that indicates to what extent you typically feel most of the time.

Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
1	2	3	4	5

1. Interested
2. Distressed
3. Excited
4. Upset
5. Strong
6. Guilty
7. Scared
8. Hostile
9. Enthusiastic
10. Proud
11. Irritable
12. Alert
13. Ashamed
14. Inspired
15. Nervous
16. Determined
17. Attentive
18. Jittery
19. Active
20. Afraid

### Emotion Regulation Questionnaire (ERQ)

In this section, we would like to ask you some questions about your emotional life, in particular, how you control (that is, regulate and manage) your emotions. We are interested in two aspects of your emotional life. One is your emotional experience, or what you feel like inside. The other is your emotional expression, or how you show your emotions in the way you talk, gesture, or behave. Although some of the following questions may seem similar to one another, they differ in important ways. For each item, please answer using the following scale:

Strongly Disagree			Neutral			Strongly Agree
1	2	3	4	5	6	7

1. When I want to feel more *positive* emotion (such as joy or amusement), I *change what I'm thinking about*.
2. I keep my emotions to myself.
3. When I want to feel less *negative* emotion (such as sadness or anger), I *change what I'm thinking about*.
4. When I am feeling *positive* emotions, I am careful NOT to express them.
5. When I'm faced with a stressful situation, I make myself *think about it* in a way that helps me stay calm.
6. I control my emotions by *not expressing them*.
7. When I want to feel more *positive* emotion, I *change the way I'm thinking* about the situation.
8. I control my emotions by *changing the way I think* about the situation I'm in.
9. When I am feeling *negative* emotions, I make sure NOT to express them.
10. When I want to feel less *negative* emotion, I *change the way I'm thinking* about the situation.

### The Self-Expressiveness in the Family Questionnaire (SEFQ)

This is a questionnaire about expressiveness. To answer the questionnaire, try to think of how frequently you express yourself during each of the following situations with family members. Circle a number on the rating scale that indicates how frequently you express yourself in that situation when it occurs. Thus, if you never or rarely express those feelings, circle a 1, 2, or 3. If you express those feelings with some or moderate frequency, circle a 4, 5, or 6. And if you express those feelings very frequently, circle a 7, 8, or 9. Some items may be difficult to judge. However, it is important to answer every item. Try to respond quickly and honestly about yourself. There are no right or wrong answers, and we don't believe that any answer is better than another.

1. Showing forgiveness to one who broke a favorite possession.
2. Thanking family members for something they have done.
3. Exclaiming over a beautiful day.
4. Showing contempt for another's actions.
5. Expressing dissatisfaction for someone else's behavior.
6. Praising someone for good work.
7. Expressing anger at someone else's carelessness.
8. Sulking over unfair treatment by a family member.
9. Blaming one another for family troubles.
10. Crying after an unpleasant disagreement.
11. Putting down other people's interests.
12. Showing dislike for someone.
13. Seeking approval for an action.
14. Expressing embarrassment over a stupid mistake.
15. Going to pieces when tension builds up.
16. Expressing exhilaration after an unexpected triumph.
17. Expressing excitement over one's future plans.
18. Demonstrating admiration.
19. Expressing sorrow when a pet dies.
20. Expressing disappointment over something that didn't work out.
21. Telling someone how nice they look.
22. Expressing sympathy for someone's troubles.
23. Expressing deep affection or love for someone.
24. Quarreling with a family member.
25. Crying when someone leaves.
26. Spontaneously hugging a family member.
27. Expressing momentary anger over a trivial irritation.
28. Expressing concern for the success of other family members.
29. Apologizing for being late.
30. Offering to do somebody a favor.
31. Snuggling up to a family member.
32. Showing how upset you are after a bad day.
33. Trying to cheer up someone who is sad.

34. Telling a family member how hurt you are.
35. Telling family members how happy you are.
36. Threatening someone.
37. Criticizing someone for being late.
38. Expressing gratitude for a favor.
39. Surprising someone with a little gift or favor.
40. Saying "I'm sorry" when one realizes one is wrong.



### Emotion Regulation Checklist (ERC)

Please rate how often your child engages in each of the following behaviors.

Never 1	Sometimes 2	Often 3	Almost Always 4
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1. Is the cheerful child.
2. Exhibits wide mood swings (child's emotional state is difficult to anticipate because s/he moves quickly from positive to negative moods).
3. Responds positively to neutral or friendly overtures by adults.
4. Transitions well from one activity to another; does not become anxious, angry, distressed, or overly excited when moving from one activity to another.
5. Can recover quickly from episodes of upset or distress (for example, does not pout or remain sullen, anxious or sad after emotionally distressing events).
6. Is easily frustrated.
7. Responds positively to neutral or friendly overtures by peers.
8. Is prone to angry outbursts/ tantrums easily.
9. Is able to delay gratification.
10. Take pleasure in the distress of others (for example, laughs when other person gets hurt or punished; enjoys teasing others).
11. Can modulate excitement in emotionally arousing situations (for example, does not get 'carried away' in high-energy play situations, or overly excited in inappropriate contexts).
12. Is whiny or clingy with adults.
13. Is prone to disruptive outbursts or energy and exuberance.
14. Responds angrily to limit-setting by adults.
15. Can say when s/he is feeling sad, angry or mad, fearful or afraid.
16. Seems sad or listless.
17. Is overly exuberant when attempting to engage others in play.
18. Displays flat affect (expression is vacant and inexpressive; child seems emotionally absent).
19. Responds negatively to neutral or friendly overtures by peers (for example, may speak in an angry tone of voice or respond fearfully).
20. Is impulsive.
21. Is empathetic towards others; shows concern when others are upset or distressed.
22. Displays exuberance that others find intrusive or disruptive.
23. Displays appropriate negative emotions (anger, fear, frustration, distress) in response to hostile, aggressive or intrusive acts by peers.
24. Displays negative emotions when attempting to engage others in play.

### Children's Behavior Questionnaire – Short Form (CBQ)

On the next pages you will see a set of statements that describe children's reactions to a number of situations. We would like you to tell us what your child's reaction is likely to be in those situations. There are of course no "correct" ways of reacting; children differ widely in their reactions, and it is these differences we are trying to learn about. Please read each statement and decide whether it is a "true" or "untrue" description of your child's reaction within the past six months. Use the following scale to indicate how well a statement describes your child:

Extremely untrue of your child	Quite untrue of your child	Slightly untrue of your child	Neither true nor false of your child	Slightly true of your child	Quite true of your child	Extremely true of your child
1	2	3	4	5	6	7

If you cannot answer one of the items because you have never seen the child in that situation, for example, if the statement is about the child's reaction to your singing and you have never sung to your child, then circle NA (not applicable). Please be sure to circle a number or NA for every item.

1. Seems always in a big hurry to get from one place to another.
2. Gets angry when told s/he has to go to bed.
3. Is not very bothered by pain.
4. Likes going down high slides or other adventurous activities.
5. Notices the smoothness or roughness of objects s/he touches.
6. Gets so worked up before an exciting event that s/he has trouble sitting still.
7. Usually rushes into an activity without thinking about it.
8. Cries sadly when a favorite toy gets lost or broken.
9. Becomes quite uncomfortable when cold and/or wet.
10. Likes to play so wild and recklessly that s/he might get hurt.
11. Seems to be at ease with almost any person.
12. Tends to run rather than walk from room to room.
13. Notices it when parents are wearing new clothing.
14. Has temper tantrums when s/he doesn't get what s/he wants.
15. Gets very enthusiastic about the things s/he does
16. When practicing an activity, has a hard time keeping her/his mind on it.
17. Is afraid of burglars or the "boogie man."
18. When outside, often sits quietly.
19. Enjoys funny stories but usually doesn't laugh at them.
20. Tends to become sad if the family's plans don't work out.
21. Will move from one task to another without completing any of them.
22. Moves about actively (runs, climbs, jumps) when playing in the house.
23. Is afraid of loud noises.

24. Seems to listen to even quiet sounds.
25. Has a hard time settling down after an exciting activity.
26. Enjoys taking warm baths.
27. Seems to feel depressed when unable to accomplish some task.
28. Often rushes into new situations.
29. Is quite upset by a little cut or bruise.
30. Gets quite frustrated when prevented from doing something s/he wants to do.
31. Becomes upset when loved relatives or friends are getting ready to leave following a visit.
32. Comments when a parent has changed his/her appearance.
33. Enjoys activities such as being chased, spun around by the arms, etc.
34. When angry about something, s/he tends to stay upset for ten minutes or longer.
35. Is not afraid of the dark.
36. Takes a long time in approaching new situations.
37. Is sometimes shy even around people s/he has known a long time.
38. Can wait before entering into new activities if s/he is asked to.
39. Enjoys "snuggling up" next to a parent or babysitter.
40. Gets angry when s/he can't find something s/he wants to play with.
41. Is afraid of fire.
42. Sometimes seems nervous when talking to adults s/he has just met.
43. Is slow and unhurried in deciding what to do next.
44. Changes from being upset to feeling much better within a few minutes.
45. Prepares for trips and outings by planning things s/he will need..
46. Becomes very excited while planning for trips.
47. Is quickly aware of some new item in the living room.
48. Hardly ever laughs out loud during play with other children.
49. Is not very upset at minor cuts or bruises.
50. Prefers quiet activities to active games.
51. Tends to say the first thing that comes to mind, without stopping to think about it.
52. Acts shy around new people.
53. Has trouble sitting still when s/he is told to (at movies, church, etc.).
54. Rarely cries when s/he hears a sad story.
55. Sometimes smiles or giggles playing by her/himself.
56. Rarely becomes upset when watching a sad event in a TV show.
57. Enjoys just being talked to.
58. Becomes very excited before an outing (e.g., picnic, party).
59. If upset, cheers up quickly when s/he thinks about something else.
60. Is comfortable asking other children to play.
61. Rarely gets upset when told s/he has to go to bed.
62. When drawing or coloring in a book, shows strong concentration.
63. Is afraid of the dark.
64. Is likely to cry when even a little bit hurt.
65. Enjoys looking at picture books.
66. Is easy to soothe when s/he is upset.
67. Is good at following instructions.

68. Is rarely frightened by "monsters" seen on TV or at movies.
69. Likes to go high and fast when pushed on a swing.
70. Sometimes turns away shyly from new acquaintances.
71. When building or putting something together, becomes very involved in what s/he is doing, and works for long periods.
72. Likes being sung to.
73. Approaches places s/he has been told are dangerous slowly and cautiously.
74. Rarely becomes discouraged when s/he has trouble making something work.
75. Is very difficult to soothe when s/he has become upset.
76. Likes the sound of words, such as nursery rhymes.
77. Smiles a lot at people s/he likes.
78. Dislikes rough and rowdy games.
79. Often laughs out loud in play with other children.
80. Rarely laughs aloud while watching TV or movie comedies.
81. Can easily stop an activity when s/he is told "no."
82. Is among the last children to try out a new activity.
83. Doesn't usually notice odors such as perfume, smoke, cooking, etc.
84. Is easily distracted when listening to a story.
85. Is full of energy, even in the evening.
86. Enjoys sitting on parent's lap.
87. Gets angry when called in from play before s/he is ready to quit.
88. Enjoys riding a tricycle or bicycle fast and recklessly.
89. Sometimes becomes absorbed in a picture book and looks at it for a long time.
90. Remains pretty calm about upcoming desserts like ice cream.
91. Hardly ever complains when ill with a cold.
92. Looks forward to family outings, but does not get too excited about them.
93. Likes to sit quietly and watch people do things.
94. Enjoys gentle rhythmic activities, such as rocking or swaying.

## Child Behavior Checklist (CBCL)

Instructions: Below is a list of items that describe children. For each item that describes your child now or within the past six months, please circle the 2 if the item is very true or often true of your child. Circle the 1 if the item is somewhat or sometimes true of your child. If the item is not true of your child, circle the 0. Please answer all items as well as you can, even if some do not seem to apply to your child.

Not True (as far as you know) 0	Somewhat or Sometimes True 1	Very True or Often True 2
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1. Acts too young for his/her age
2. Allergy (describe):
3. Argues a lot
4. Asthma
5. Behaves like opposite sex
6. Bowel movements outside toilet.
7. Bragging, boasting
8. Can't concentrate, can't pay attention for long
9. Can't get his/her mind of certain thoughts; obsessions (describe):
10. Can't sit still, restless, or hyperactive
11. Cling to adults or too dependent
12. Complains of loneliness
13. Confused or seems to be in a fog
14. Cries a lot
15. Cruelty to animals
16. Cruelty, bullying, or meanness to others
17. Day-dreams or gets lost in his/her thoughts
18. Deliberately harms self or attempts suicide
19. Demands a lot of attention
20. Destroys his/her own things
21. Destroys things belonging to his/her family
22. Disobedient at home
23. Disobedient at school
24. Doesn't eat well
25. Doesn't get along with other children
26. Doesn't seem to feel guilty after misbehaving
27. Easily jealous
28. Eats or drinks things that are not food (describe):
29. Fears certain animals, situations, or places other than school (describe):
30. Fears going to school
31. Fears he/she might do something bad
32. Feels he/she might have to be perfect
33. Feels or complains that no one love him/her

34. Feels other are out to get him/her
35. Feels worthless or inferior
36. Gets hurt a lot, accident-prone
37. Gets in many fights
38. Gets teased a lot
39. Hangs around with those that get in trouble
40. Hears things that aren't there (describe):
41. Impulsive or acts without thinking
42. Likes to be alone
43. Lying or cheating
44. Bites fingernails
45. Nervous, high-strung, or tense
46. Nervous moments or twitching (describe):
47. Nightmares
48. Not liked by other pupils
49. Constipated, doesn't move bowels
50. Too fearful or anxious
51. Feels dizzy
52. Feels too guilty
53. Overeating
54. Overtired
55. Overweight
56. Physical problems without known medical cause:
  - a. Aches or pains (not headaches)
  - b. Headaches
  - c. Nausea, feels sick
  - d. Problems with eyes (describe):
  - e. Rashes or other skin problems
  - f. Stomachaches or cramps
  - g. Vomiting, throwing up
  - h. Other (describe):
57. Physically attacks people
58. Picks nose, skin, or other parts of the body (describe):
59. Plays with own sex parts in public
60. Plays with own sex parts too much
61. Poor school work
62. Poorly coordinated or clumsy
63. Prefers being with older children
64. Prefers being with younger children
65. Refuses to talk
66. Repeats certain acts over and over; compulsions (describe):
67. Runs away from home
68. Screams a lot
69. Secretive, keeps things to self
70. Sees things that aren't there (describe):

71. Self-conscious or easily embarrassed
72. Sets fires
73. Sexual problems (describe):
74. Showing off or clowning
75. Shy or timid
76. Sleeps less than most children
77. Sleeps more than most children during day and/or night (describe):
78. Smears or plays with bowel movements
79. Speech problem (describe):
80. Stares blankly
81. Steals at home
82. Steals outside the home
83. Stores up things he/she doesn't need (describe):
84. Strange behavior (describe):
85. Strange ideas (describe):
86. Stubborn, sullen, or irritable
87. Sudden changes in mood or feelings
88. Sulks a lot
89. Suspicious
90. Swearing or obscene language
91. Talks about killing self
92. Talks or walks in sleep (describe):
93. Talks too much
94. Teases a lot
95. Temper tantrums or hot temper
96. Thinks about sex too much
97. Threatens people
98. Thumb-sucking
99. Too concerned with neatness or cleanliness
100. Trouble sleeping (describe):
101. Truancy, skips school
102. Underactive, slow moving, lack energy
103. Unhappy, sad, or depressed
104. Unusually loud
105. Uses alcohol or drugs (describe):
106. Vandalism
107. Wets self during the day
108. Wets the bed
109. Whining
110. Wishes to be of opposite sex
111. Withdrawn, doesn't get involved with others
112. Worrying
113. Please write in any problems the pupil has that were not listed above:

## Appendix B

### *Additional Descriptive Results*

#### *Stability in Language Use for Children Over 1-year Interval*

LIWC Category	Time 1 <i>Mean (SD)</i>	Time 2 <i>Mean (SD)</i>	Paired-sample <i>t</i> -test <i>p</i> -value	Stability Over 1-year ( <i>r</i> )
Sixltr	3.77 (1.40)	4.26 (1.21)	.06	0.37
funct	44.35 (8.56)	45.92 (8.88)	0.30	0.50
pronoun	18.25 (3.36)	18.37 (4.06)	0.86	0.39
ppron	12.14 (2.62)	11.79 (2.43)	0.50	0.30
i	7.35 (1.90)	6.78 (1.54)	0.14	0.20
we	1.00 (0.54)	0.94 (0.51)	0.59	0.26
you	2.57 (0.86)	2.81 (1.04)	0.28	0.08
shehe	0.87 (0.62)	0.91 (0.55)	0.73	0.03
they	0.36 (0.27)	0.35 (0.24)	0.90	0.15
ipron	6.12 (1.54)	6.58 (2.06)	0.15	0.49
article	3.22 (1.03)	3.49 (0.86)	0.17	0.31
verb	16.10 (2.89)	16.31 (3.20)	0.73	0.30
auxverb	9.05 (2.37)	9.59 (2.81)	0.25	0.45
past	1.85 (0.75)	2.03 (0.80)	0.33	0.10
present	13.24 (2.42)	13.09 (2.75)	0.78	0.22
future	0.45 (0.32)	0.63 (0.28)	0.00	0.40
adverb	3.53 (1.28)	3.96 (1.07)	0.06	0.35
preps	6.13 (1.73)	6.23 (1.53)	0.73	0.47
conj	2.81 (1.28)	3.13 (1.17)	0.10	0.57
negate	3.36 (1.24)	2.88 (1.22)	0.10	0.06
quant	1.09 (0.47)	1.26 (0.50)	0.14	0.10
number	1.61 (0.91)	1.85 (1.04)	0.27	0.19
swear	0.03 (0.13)	0.04 (0.08)	0.73	-0.09
social	9.76 (2.30)	10.07 (2.52)	0.61	-0.08
family	2.57 (1.43)	2.53 (2.04)	0.91	0.26
friend	0.04 (0.06)	0.06 (0.09)	0.20	-0.28
humans	0.48 (0.34)	0.51 (0.37)	0.76	-0.19
affect	3.03 (1.14)	3.62 (1.18)	0.03	0.16
posemo	2.65 (1.07)	2.98 (0.93)	0.14	0.21
negemo	0.54 (0.43)	0.77 (0.56)	0.05	0.04
anx	0.06 (0.08)	0.09 (0.13)	0.18	0.17
anger	0.13 (0.17)	0.19 (0.20)	0.13	0.20
sad	0.15 (0.19)	0.16 (0.18)	0.75	0.03
cogmech	9.67 (2.43)	9.64 (2.48)	0.92	0.60
insight	0.83 (0.49)	0.94 (0.47)	0.35	-0.10
cause	1.29 (0.70)	1.25 (0.42)	0.69	0.42
discrep	1.99 (0.88)	1.68 (0.46)	0.04	0.31
tentat	0.91 (0.52)	1.12 (0.58)	0.04	0.37
certain	0.38 (0.28)	0.51 (0.28)	0.07	-0.11
inhib	0.37 (0.32)	0.45 (0.30)	0.24	0.17
incl	2.79 (0.82)	2.51 (0.91)	0.11	0.29
excl	1.52 (0.75)	1.64 (0.76)	0.31	0.53
percept	2.76 (0.99)	2.75 (1.05)	0.93	0.42
see	1.63 (0.77)	1.51 (0.75)	0.49	0.21
hear	0.45 (0.31)	0.56 (0.34)	0.14	0.10
feel	0.48 (0.29)	0.47 (0.30)	0.88	-0.04



bio	1.48 (0.71)	1.47 (0.59)	0.97	0.25
body	0.73 (0.37)	0.68 (0.39)	0.54	0.24
health	0.15 (0.20)	0.14 (0.15)	0.91	-0.22
sexual	0.12 (0.17)	0.09 (0.12)	0.36	0.00
ingest	0.52 (0.37)	0.60 (0.34)	0.32	0.07
relativ	9.30 (2.25)	9.90 (1.83)	0.21	0.09
motion	2.81 (1.01)	2.96 (1.02)	0.49	0.17
space	4.07 (1.26)	4.00 (1.01)	0.77	0.18
time	2.61 (0.97)	3.15 (0.90)	0.01	0.22
work	0.32 (0.31)	0.36 (0.25)	0.58	-0.01
achieve	0.46 (0.51)	0.58 (0.48)	0.28	0.14
leisure	1.12 (0.50)	0.97 (0.47)	0.15	0.18
home	0.38 (0.29)	0.46 (0.37)	0.27	0.19
money	0.14 (0.23)	0.29 (0.66)	0.22	-0.07
relig	0.06 (0.09)	0.07 (0.09)	0.78	0.39
death	0.03 (0.07)	0.05 (0.09)	0.59	-0.06
assent	5.23 (4.05)	5.38 (2.72)	0.83	0.27
nonfl	1.96 (2.88)	1.80 (1.13)	0.74	0.21
filler	0.39 (0.37)	0.38 (0.37)	0.97	0.17

*Stability in Language Use for Mothers Over 1-year Interval*

LIWC Category	Time 1 <i>Mean (SD)</i>	Time 2 <i>Mean (SD)</i>	Paired-sample <i>t-test p-value</i>	Reliability Over 1-year ( <i>r</i> )
Sixltr	5.36 (1.70)	5.25 (1.17)	0.73	0.20
funct	46.16 (7.43)	45.58 (8.46)	0.74	0.14
pronoun	17.98 (3.14)	17.38 (3.65)	0.43	0.14
ppron	11.43 (1.96)	11.20 (2.34)	0.57	0.39
i	3.34 (0.85)	3.16 (1.04)	0.37	0.30
we	1.24 (0.67)	1.27 (0.79)	0.89	-0.02
you	5.27 (1.38)	4.96 (1.54)	0.30	0.31
shehe	1.06 (0.80)	1.02 (0.77)	0.82	-0.04
they	0.52 (0.37)	0.79 (0.69)	0.04	0.16
ipron	6.55 (1.98)	6.17 (1.84)	0.41	0.03
article	3.11 (0.93)	3.40 (1.06)	0.14	0.33
verb	16.48 (2.80)	15.96 (2.82)	0.38	0.24
auxverb	9.16 (1.78)	8.85 (1.66)	0.40	0.24
past	2.39 (1.13)	2.33 (0.93)	0.81	0.05
present	12.73 (2.40)	12.30 (2.31)	0.36	0.32
future	0.61 (0.35)	0.65 (0.43)	0.73	-0.17
adverb	4.54 (1.19)	4.27 (1.22)	0.31	0.17
preps	7.64 (1.63)	7.05 (2.08)	0.16	0.17
conj	3.47 (1.90)	3.69 (1.22)	0.58	-0.04
negate	2.85 (1.07)	2.79 (0.95)	0.77	0.18
quant	1.35 (0.74)	1.48 (0.57)	0.42	0.07
number	1.03 (0.83)	1.28 (0.95)	0.14	0.39
swear	0.01 (0.03)	0.05 (0.08)	0.04	-0.19
social	11.03 (2.41)	11.05 (2.28)	0.96	0.37
family	0.50 (0.30)	0.46 (0.40)	0.56	0.26
friend	0.23 (0.32)	0.15 (0.19)	0.16	0.18
humans	0.56 (0.35)	0.55 (0.42)	0.95	0.14
affect	4.95 (1.32)	4.82 (2.66)	0.74	0.46
posemo	4.47 (1.37)	4.32 (2.72)	0.70	0.53
negemo	0.69 (0.36)	0.67 (0.45)	0.81	0.10

anx	0.13 (0.15)	0.10 (0.16)	0.46	-0.06
anger	0.10 (0.16)	0.16 (0.14)	0.07	0.12
sad	0.23 (0.24)	0.16 (0.18)	0.13	0.24
cogmech	10.86 (2.56)	11.60 (2.27)	0.21	-0.02
insight	1.47 (0.64)	1.41 (0.60)	0.73	-0.09
cause	1.18 (0.59)	1.12 (0.52)	0.70	-0.09
discrep	1.58 (0.73)	1.55 (0.61)	0.88	0.08
tentat	1.48 (0.65)	1.65 (0.94)	0.35	0.13
certain	0.57 (0.33)	0.88 (0.51)	0.01	-0.21
inhib	0.49 (0.26)	0.46 (0.36)	0.67	0.05
incl	3.02 (1.26)	3.35 (1.05)	0.29	-0.18
excl	1.87 (0.63)	2.04 (0.87)	0.39	-0.2
percept	2.79 (1.25)	2.38 (0.80)	0.12	-0.05
see	1.18 (0.70)	1.21 (0.80)	0.85	0.17
hear	0.63 (0.55)	0.47 (0.32)	0.18	-0.17
feel	0.70 (0.50)	0.46 (0.37)	0.03	-0.02
bio	1.78 (0.92)	1.79 (0.84)	0.96	-0.02
body	0.89 (0.58)	0.71 (0.50)	0.19	-0.09
health	0.21 (0.28)	0.18 (0.16)	0.67	-0.26
sexual	0.09 (0.14)	0.15 (0.20)	0.18	0.06
ingest	0.60 (0.53)	0.77 (0.55)	0.13	0.30
relativ	11.02 (2.68)	10.56 (2.72)	0.44	0.16
motion	3.00 (0.99)	2.77 (1.04)	0.36	-0.04
space	4.94 (1.54)	4.64 (1.28)	0.40	-0.02
time	3.31 (0.87)	3.27 (1.21)	0.84	-0.30
work	0.49 (0.37)	0.51 (0.43)	0.83	0.02
achieve	0.53 (0.36)	0.46 (0.29)	0.36	0.27
leisure	0.81 (0.58)	0.88 (0.59)	0.50	0.33
home	0.44 (0.30)	0.51 (0.38)	0.38	-0.06
money	0.27 (0.26)	0.32 (0.44)	0.55	-0.04
relig	0.10 (0.15)	0.07 (0.11)	0.40	-0.05
death	0.03 (0.12)	0.04 (0.12)	0.61	0.01
assent	3.92 (1.46)	4.35 (4.09)	0.45	0.67
nonfl	0.94 (0.45)	1.27 (0.91)	0.05	0.10
filler	0.36 (0.29)	0.36 (0.31)	0.96	-0.01

*Stability in Language Use for Father Over 1-year Interval*

LIWC Category	Time 1 Mean (SD)	Time 2 Mean (SD)	Paired-sample t-test p-value	Reliability Over 1-year ( <i>r</i> )
Sixltr	5.16 (1.88)	4.88 (1.53)	0.46	0.18
funct	42.08 (9.69)	45.11 (8.01)	0.06	0.48
pronoun	16.50 (3.50)	17.15 (2.94)	0.35	0.22
ppron	10.17 (2.29)	10.61 (1.79)	0.26	0.41
i	2.72 (1.32)	3.26 (1.54)	0.11	0.06
we	1.23 (1.08)	1.07 (0.65)	0.52	-0.29
you	5.00 (2.03)	4.90 (1.49)	0.83	-0.23
shehe	0.71 (0.63)	0.84 (0.59)	0.31	0.25
they	0.51 (0.39)	0.54 (0.46)	0.76	0.31
ipron	6.33 (1.94)	6.54 (1.96)	0.66	0.01
article	3.31 (1.52)	3.32 (1.19)	0.95	0.16
verb	15.32 (3.66)	15.39 (2.97)	0.90	0.44
auxverb	7.92 (3.00)	8.53 (1.94)	0.26	0.25
past	2.17 (1.17)	2.37 (1.09)	0.51	-0.14

present	11.79 (3.24)	11.70 (2.74)	0.88	0.36
future	0.59 (0.48)	0.64 (0.51)	0.64	0.27
adverb	4.36 (1.48)	4.59 (1.47)	0.31	0.61
preps	7.06 (2.08)	7.93 (1.81)	0.01	0.47
conj	2.68 (1.49)	3.11 (1.31)	0.12	0.35
negate	2.41 (1.15)	2.87 (1.26)	0.08	0.25
quant	1.22 (0.76)	1.47 (0.76)	0.06	0.50
number	1.15 (1.24)	1.14 (0.63)	0.98	0.07
swear	0.03 (0.10)	0.05 (0.12)	0.38	0.32
social	10.79 (3.74)	10.38 (1.85)	0.60	-0.31
family	0.55 (0.95)	0.51 (0.50)	0.82	0.02
friend	0.24 (0.37)	0.20 (0.35)	0.59	0.46
humans	0.38 (0.35)	0.42 (0.28)	0.62	0.18
affect	4.44 (1.68)	4.35 (3.37)	0.87	0.37
posemo	4.07 (1.57)	3.86 (3.39)	0.71	0.36
negemo	0.56 (0.48)	0.62 (0.40)	0.63	-0.02
anx	0.08 (0.17)	0.06 (0.10)	0.65	-0.19
anger	0.10 (0.15)	0.17 (0.21)	0.09	-0.02
sad	0.13 (0.15)	0.10 (0.14)	0.28	0.25
cogmech	9.93 (3.23)	10.90 (3.16)	0.12	0.37
insight	1.24 (0.89)	1.10 (0.71)	0.40	0.31
cause	1.09 (0.71)	1.18 (1.05)	0.69	-0.17
discrep	1.60 (0.73)	1.36 (0.65)	0.18	-0.12
tentat	1.31 (0.71)	1.67 (0.89)	0.02	0.43
certain	0.56 (0.37)	0.67 (0.48)	0.27	0.11
inhib	0.42 (0.42)	0.58 (0.52)	0.13	0.13
incl	2.88 (1.75)	3.08 (1.32)	0.63	-0.12
excl	1.60 (0.87)	2.17 (1.13)	0.02	0.07
percept	2.49 (1.30)	1.94 (0.76)	0.02	0.32
see	1.13 (0.97)	0.88 (0.41)	0.16	0.16
hear	0.60 (0.91)	0.57 (0.43)	0.89	-0.24
feel	0.50 (0.42)	0.37 (0.35)	0.09	0.39
bio	1.64 (1.55)	1.69 (0.96)	0.87	-0.18
body	0.75 (1.04)	0.66 (0.61)	0.69	-0.24
health	0.16 (0.28)	0.16 (0.18)	0.91	0.18
sexual	0.09 (0.20)	0.07 (0.11)	0.54	0.00
ingest	0.66 (0.62)	0.81 (0.75)	0.34	0.10
relativ	10.36 (3.41)	11.81 (3.34)	0.01	0.57
motion	2.99 (1.30)	3.47 (1.39)	0.13	0.08
space	4.50 (1.73)	5.17 (1.85)	0.01	0.65
time	3.12 (1.29)	3.23 (1.23)	0.61	0.49
work	0.40 (0.35)	0.38 (0.39)	0.85	0.01
achieve	0.40 (0.31)	0.49 (0.43)	0.32	-0.15
leisure	0.88 (0.79)	0.82 (0.50)	0.66	0.09
home	0.35 (0.33)	0.45 (0.40)	0.15	0.32
money	0.35 (0.89)	0.37 (0.51)	0.91	0.01
relig	0.06 (0.13)	0.08 (0.17)	0.75	-0.22
death	0.01 (0.05)	0.03 (0.09)	0.24	-0.09
assent	3.99 (2.54)	3.91 (3.28)	0.90	0.06
nonfl	0.84 (0.58)	1.12 (0.83)	0.10	0.07
filler	0.40 (0.43)	0.41 (0.37)	0.88	0.61

*Means, Standard Deviations, and Reliabilities for Non-Emotion Behavior Coding of Natural Interactions*

SECSI Coding Category	T1 <i>Mean (SD)</i>	T2 <i>Mean (SD)</i>	Paired <i>t</i> -tests <i>p</i> -values
<i>Location</i>			
At home ( $\alpha=.96$ )	71.33 (17.06)	66.80 (23.00)	.37
Outside ( $\alpha=.75$ )	7.74 (11.84)	12.15 (13.16)	.17
Restaurant ( $\alpha=.93$ )	1.51 (2.97)	1.24 (2.59)	.69
Other public place ( $\alpha=.88$ )	9.91 (9.63)	11.22 (15.50)	.70
<i>Activity</i>			
TV ( $\alpha=.85$ )	27.66 (15.08)	28.84 (21.49)	.70
Computer ( $\alpha=.92$ )	1.43 (4.48)	1.14 (3.82)	.77
Reading ( $\alpha=.93$ )	1.09 (1.94)	0.23 (0.69)	.02
Playing ( $\alpha=.93$ )	23.70 (14.37)	18.00 (16.30)	.17
Sleeping ( $\alpha=.91$ )	4.50 (7.98)	2.74 (6.48)	.35
Chores ( $\alpha=.44$ )	0.78 (1.20)	3.28 (8.02)	.07
Eating ( $\alpha=.61$ )	3.70 (3.55)	5.16 (5.10)	.16

*Note:* Mean and standard deviation values reflect the percentage of overall 30-second segments where this behavior occurred at least once. For example, 73.73% of all recording blocks of children in Time 1 were associated with the child's being with others. Alpha values for inter-coder reliability are reported in parentheses after each variable.

*Descriptive Results for Emotion Language Coding of Lab Interactions*

Coding Category	Children <i>Mean (SD)</i>	Intraclass Correlation	Parents <i>Mean (SD)</i>	Intraclass Correlation
Positive Emotion Word	0.36 (0.66)	.98	0.89 (1.42)	.99
Negative Emotion Word	1.09 (1.68)	.99	2.38 (3.50)	.99
Neutral Emotion Word	0.01 (0.05)	Zero	0.16 (0.55)	.94
Elaboration: Cause	0.10 (0.35)	.81	0.60 (1.27)	.97
Elaboration: Result	0.06 (0.21)	.59	0.13 (0.32)	.70
Elaborations: Intervention	0.0 (0.00)	Zero	0.0 (0.00)	Zero
Elaboration: Elicit				
Overall Emotion	0.28 (0.83)	.99	1.55 (2.21)	.99
Elaboration	n/a	n/a	2.80 (0.94)	.93
Overall General				
Elaboration	n/a	n/a	2.01 (0.94)	.96

## Appendix C

### *Additional Research Question 3 Results*

#### *Correlation of Parent Subscale Ratings of Children's Emotion-Oriented Variables with Children's Emotion Language Use*

	Child T1 Positive Emotion Words	Child T1 Negative Emotion Words	Child T2 Positive Emotion Words	Child T2 Negative Emotion Words
<b>Mothers</b>				
<i>Activity Level</i>	-.23	.14	-.23	.31+
<i>High Intensity Pleasure</i>	-.09	.16	-.16	.09
<i>Impulsivity</i>	-.23	.10	-.05	.29+
<i>Shyness</i>	-.14	.11	.00	-.18
<i>Anger</i>	-.07	-.05	-.29+	.16
<i>Discomfort</i>	-.02	.18	.11	-.06.
<i>Fear</i>	-.05	.01	.12	.13
<i>Sadness</i>	.00	.18	.26	-.08
<i>Soothability</i>	.07	-.01	.29+	.23
<i>Attentional Focusing</i>	.25+	.14	.05	-.17
<i>Inhibitory Control</i>	.06	.32*	.14	-.19
<i>Low Intensity Pleasure</i>	.15	.31*	.03	.06
<i>Perceptual Sensitivity</i>	.04	.28+	.05	.05
<b>Fathers</b>				
<i>Activity Level</i>	-.18	.00	-.37*	.13
<i>High Intensity Pleasure</i>	-.20	.05	-.04	.23
<i>Impulsivity</i>	-.13	-.02	-.23	.17
<i>Shyness</i>	-.03	-.01	.17	-.10
<i>Anger</i>	-.04	-.07	-.33+	.23
<i>Discomfort</i>	.20	.02	.06	-.19
<i>Fear</i>	.12	-.17	.12	.17
<i>Sadness</i>	.14	.07	.17	.06
<i>Soothability</i>	-.10	.01	.03	.36*
<i>Attentional Focusing</i>	.27+	.22	-.10	-.09
<i>Inhibitory Control</i>	.20	.18	.13	-.14
<i>Low Intensity Pleasure</i>	-.12	.33*	-.19	.27
<i>Perceptual Sensitivity</i>	.01	.22	-.22	-.14

*Note:* +  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ ; df range from 33 to 34

*Correlation of Parent Subscale Ratings of Children's Problem Behaviors with Children's Emotion Language Use*

	Child T1 Positive Emotion Words	Child T1 Negative Emotion Words	Child T2 Positive Emotion Words	Child T2 Negative Emotion Words
<b>Mother's Ratings</b>				
<i>Withdrawn</i>	.20	-.09	.06	-.16
<i>Anxiety/Depression</i>	.08	-.11	-.20	.14
<i>Somatic Complaints</i>	-.11	.02	-.46**	.33+
<i>Aggression</i>	.00	-.09	-.21	-.18
<i>Delinquency</i>	.02	-.09	.09	.16
<i>Social Problems</i>	.01	.15	-.16	.05
<i>Thought Problems</i>	-.25	.08	-.11	-.12
<i>Attention Problems</i>	.42*	.24	-.01	-.05
<b>Father's Ratings</b>				
<i>Withdrawn</i>	.06	-.20	.17	.11
<i>Anxiety/Depression</i>	-.03	-.08	.05	-.06
<i>Somatic Complaints</i>	-.42*	-.16	-.32+	.25
<i>Aggression</i>	-.21	-.03	-.15	.08
<i>Delinquency</i>	-.16	-.18	-.07	.13
<i>Social Problems</i>	-.19	-.02	-.08	.05
<i>Thought Problems</i>	-.17	-.03	.30+	.25
<i>Attention Problems</i>	-.12	.17	-.42*	.09

Note: +  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ ,  $df = 31$

*Correlations Between Children's Emotion Language Use and Parents' CBCL Ratings*

	Mother- Father INT	Mother- Father EXT	Mother Attn Probs	Father Attn Probs
<b>Lab</b>				
<i>Positive Emotion</i>	.01	.12	-.02	-.28
<i>Negative Emotion</i>	.42*	-.25	-.14	-.09

Note: +  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ ; ,  $df = 31$ ; INT and EXT scores are averages of the mother and father ratings for each child.

*Correlation of Children's Emotion Language Use with Emotion Behaviors*

	T1 Laugh	T1 Sing	T1 Cry	T1 Whine	T2 Laugh	T2 Sing	T2 Cry	T2 Whine
<b>Lab</b>								
<i>Positive Emotion</i>	-.07	-.13	-.09	-.07	.04	-.24	-.08	.08
<i>Negative Emotion</i>	-.11	.11	-.20	-.18	.13	.14	-.18	-.10

Note: +  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ , ,  $df = 34$

*Correlation of Children's Emotional Understanding with Emotion Language Use*

	Expressive Knowledge	Receptive Knowledge	Situational Knowledge	Situational Knowledge (non-stereotypical)
Lab				
<i>Positive Emotion</i>	.12	.29	.36+	.07
<i>Negative Emotion</i>	-.05	-.02	.29	.34+

Note: +  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ , ,  $df = 34$

*Correlation of Parent Ratings of Children's Emotion-Oriented Variables with Mothers' Emotion Language Use*

	Mother T1 Positive Emotion Words	Mother T1 Negative Emotion Words	Mother T2 Positive Emotion Words	Mother T2 Negative Emotion Words
Family SES	-.07	.03	.28	-.26
Child PPVT	-.27	-.24	-.04	.03
Mother				
<i>Negativity</i>	.32+	.10	-.13	-.15
<i>Emotion Regulation</i>	-.28+	-.31+	.12	.11
<i>Surgency</i>	.32+	-.13	.30+	-.23
<i>Negative Emotionality</i>	-.12	.15	-.48**	.08
<i>Effortful Control</i>	-.28+	-.04	-.02	.32+
Father				
<i>Negativity</i>	.11	.08	-.05	-.04
<i>Emotion Regulation</i>	.30+	.01	.25	.20
<i>Surgency</i>	.27	.06	.39*	-.27
<i>Negative Emotionality</i>	.03	-.01	-.39*	.38*
<i>Effortful Control</i>	-.12	.12	.01	.33+

Note: +  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ ,  $df$  range from 33 to 34

*Correlation of Parent Ratings of Children's Emotion-Oriented Variables with Fathers' Emotion Language Use*

	Father T1 Positive Emotion Words	Father T1 Negative Emotion Words	Father T2 Positive Emotion Words	Father T2 Negative Emotion Words
Family SES	.11	.30+	.16	.01
Child PPVT	-.48**	-.09	-.32+	-.33+
Mother				
<i>Negativity</i>	-.05	.06	.02	-.03
<i>Emotion Regulation</i>	-.39*	-.14	-.08	.08
<i>Surgency</i>	-.23	-.08	-.16	.00
<i>Negative Emotionality</i>	-.07	-.01	-.15	.19
<i>Effortful Control</i>	-.23	-.05	-.16	-.11
Father				
<i>Negativity</i>	-.25	-.04	.00	.13
<i>Emotion Regulation</i>	.12	-.18	-.18	.01
<i>Surgency</i>	-.34+	-.13	-.20	.04
<i>Negative Emotionality</i>	-.08	-.01	-.27	-.04
<i>Effortful Control</i>	-.01	-.06	-.21	-.20

Note: +  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ , df range from 33 to 34

*Correlations Between Parents' CBCL Ratings and Their Emotion Language Use*

	Mother- Father INT	Mother- Father EXT	Mother Attn Problems	Father Attn Problems
Time 1				
<i>Mother Positive Emotion</i>	-.23	.03	.15	.17
<i>Mother Negative Emotion</i>	.10	-.18	.13	.32+
<i>Father Positive Emotion</i>	-.17	-.10	.24	.07
<i>Father Negative Emotion</i>	-.08	.01	.53**	.16
Time 2				
<i>Mother Positive Emotion</i>	-.23	.01	-.06	.21
<i>Mother Negative Emotion</i>	-.07	.14	-.08	.01
<i>Father Positive Emotion</i>	-.08	.00	-.04	.20
<i>Father Negative Emotion</i>	.08	.53**	-.19	.07
Lab				
<i>Mother Positive Emotion</i>	-.14	.23	.06	-.05
<i>Mother Negative Emotion</i>	.11	-.22	-.31+	-.08
<i>Father Positive Emotion</i>	-.05	-.09	-.01	-.07
<i>Father Negative Emotion</i>	.04	.03	-.10	.09

Note: +  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ ,  $df = 31$



*Correlation of Children's EU with Parents' Emotion Language Use*

	Expressive Knowledge	Receptive Knowledge	Situational Knowledge	Situational Knowledge (non- stereotypical)
<b>Time 1</b>				
<i>Mother Positive Emotion</i>	-.07	-.09	-.02	-.13
<i>Mother Negative Emotion</i>	-.24	.00	-.25	-.18
<i>Father Positive Emotion</i>	-.14	.11	-.13	-.17
<i>Father Negative Emotion</i>	-.01	.13	-.15	.10
<b>Time 2</b>				
<i>Mother Positive Emotion</i>	.07	-.02	.21	-.13
<i>Mother Negative Emotion</i>	.20	.05	-.14	-.01
<i>Father Positive Emotion</i>	-.23	-.06	-.41*	-.29
<i>Father Negative Emotion</i>	.20	-.01	-.06	-.06
<b>Lab</b>				
<i>Mother Positive Emotion</i>	.12	.20	.31+	.12
<i>Mother Negative Emotion</i>	-.26	.22	.14	.44*
<i>Father Positive Emotion</i>	.02	.12	.18	.20
<i>Father Negative Emotion</i>	.15	-.30	.29	.08

Note: +  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ ,  $df=34$

## Appendix D

### LIWC Emotion Word Dictionaries

#### Positive Emotion Words

accept	care	determina*	freeb*	harmless*	kidding	palatabl*	save	terrific*
accepta*	cared	determined	freed*	harmon*	kindly	paradise	scrumptious*	<b>thank</b>
accepted	carefree	devot*	freeing	heartfelt	kindn*	partie*	secur*	thanked
accepting	careful*	digni*	freely	heartwarm*	<b>kiss*</b>	party*	sentimental*	thankf*
accepts	cares	divin*	freeness	heaven*	laidback	passion*	share	thanks
active*	caring	dynam*	freer	<b>heh*</b>	laugh*	peace*	shared	thoughtful*
admir*	casual	eager*	frees*	helper*	libert*	perfect*	shares	thrill*
ador*	casually	ease*	friend*	helpful*	likeab*	<b>play</b>	sharing	toleran*
advantag*	certain*	easie*	<b>fun</b>	helping	liked	played	silli*	tranquil*
adventur*	challeng*	easily	<b>funn*</b>	helps	likes	playful*	<b>silly</b>	treasur*
affection*	champ*	easiness	genero*	hero*	liking	<b>playing</b>	sincer*	treat
agree	charit*	easing	gentle	hilarious	livel*	plays	smart*	triumph*
agreeab*	charm*	easy*	gentler	hoho*	LMAO	pleasant*	smil*	true
agreed	cheer*	ecsta*	gentlest	honest*	LOL	<b>please*</b>	sociab*	trueness
agreeing	cherish*	efficien*	gently	honor*	<b>love</b>	pleasing	soulmate*	truer
agreement*	chuckl*	elegan*	gigggl*	honour*	loved	pleasur*	special	truest
agrees	clever*	encourag*	giver*	hope	lovely	popular*	splend*	truly
<b>alright*</b>	comed*	energ*	giving	hoped	lover*	positiv*	strength*	trust*
amaz*	comfort*	engag*	glad	hopeful	loves	prais*	strong*	truth*
amor*	commitment*	enjoy*	gladly	hopefully	loving*	precious*	succeed*	useful*
amus*	compassion*	entertain*	glamor*	hopefulness	loyal*	prettie*	success*	valuabl*
aok	compliment*	enthus*	glamour*	hopes	luck	<b>pretty</b>	sunnier	value
appreciat*	confidence	excel*	glori*	hoping	lucked	pride	sunniest	valued
assur*	confident	excit*	glory	hug	lucki*	privileg*	sunny	values
attachment*	confidently	fab	<b>good</b>	hugg*	lucks	prize*	sunshin*	valuing
attract*	considerate	fabulous*	goodness	hugs	lucky	profit*	super	vigor*
award*	contented*	faith*	gorgeous*	humor*	madly	promis*	superior*	vigour*
awesome	contentment	fantastic*	grace	humour*	magnific*	proud*	support	virtue*
beaut*	convinc*	favor*	graced	hurra*	merit*	radian*	supported	virtuo*
beloved	<b>cool</b>	favour*	graceful*	ideal*	merr*	readiness	supporter*	vital*
benefic*	courag*	fearless*	graces	importan*	neat*	ready	supporting	warm*
benefit	create*	festiv*	graci*	impress*	<b>nice*</b>	reassur*	supportive*	wealth*
benefits	creati*	fiesta*	grand	improve*	nurtur*	relax*	supports	welcom*
benefitt*	credit*	<b>fine</b>	grande*	improving	<b>ok</b>	relief	suprem*	<b>well*</b>
benevolen*	cute*	flatter*	gratef*	incentive*	<b>okay</b>	reliev*	sure*	<b>win</b>
benign*	cutie*	flawless*	grati*	innocen*	okays	resolv*	surpris*	winn*
best	daring	flexib*	great	inspir*	oks	respect	sweet	wins
<b>better</b>	darlin*	flirt*	grin	intell*	openminded*	revigor*	sweetheart*	wisdom
bless*	dear*	fond	grinn*	interest*	openness	reward*	sweetie*	wise*

bold*	definite	fondly	grins	invigor*	opportun*	rich*	sweetly	won
bonus*	definitely	fondness	<b>ha</b>	joke*	optimal*	ROFL	sweetness*	wonderf*
brave*	delectabl*	forgave	haha*	joking	optimi*	romanc*	sweets	worship*
bright*	delicate*	forgiv*	handsom*	joll*	original	romantic*	talent*	worthwhile
brillian*	delicious*	free	happi*	joy*	outgoing	safe*	tehe	<b>wow*</b>
calm*	deligh*	free*	<b>happy</b>	keen*	painl*	satisf*	tender*	<b>yay*</b>

Note: The twenty-five most commonly used positive emotion words by children from the natural setting transcriptions are in bold.

## Negative Emotion Words

abandon*	brutal*	disappoint*	feared	<b>hate</b>	lazier*	nag*	rape*	sin	teas*	unsuccessful*
abuse*	burden*	disaster*	fearful*	hated	lazy	nast*	raping	sinister	temper	unsure*
abusi*	careless*	discomfort*	fearing	hateful*	liabilit*	needy	rapist*	sins	tempers	unwelcom*
ache*	cheat*	discourag*	fears	hater*	liar*	neglect*	rebel*	skeptic*	tense*	upset*
aching	complain*	disgust*	feroc*	hates	lied	nerd*	reek*	slut*	tensing	uptight*
advers*	confront*	dishearten*	feud*	hating	lies	nervous*	regret*	smother*	tension*	useless*
afraid	confus*	disillusion*	fiery	hatred	lone*	neurotic*	reject*	smug*	terribl*	vain
aggravat*	contempt*	dislike	<b>fight*</b>	heartbreak*	longing*	numb*	reluctan*	snob*	terrified	vanity
aggress*	contradic*	disliked	fired	heartbroke*	lose	obnoxious*	remorse*	sob	terrifies	vicious*
agitat*	crap	dislikes	flunk*	heartless*	loser*	obsess*	repress*	sobbed	terrify	victim*
agoniz*	crappy	disliking	foe*	hell	loses	offence*	resent*	sobbing	terrifying	vile
agony	<b>craz*</b>	dismay*	fool*	hellish	<b>losing</b>	offend*	resign*	sobs	terror*	villain*
alarm*	cried	dissatisf*	forbid*	helpless*	loss*	offens*	restless*	solemn*	thief	violat*
alone	cries	distract*	fought	hesita*	<b>lost</b>	outrag*	revenge*	sorrow*	thieve*	violent*
anger*	critical	distraught	frantic*	homesick*	lous*	overwhelm*	ridicul*	<b>sorry</b>	threat*	vulnerab*
<b>angr*</b>	critici*	distress*	freak*	hopeless*	<b>low*</b>	pain	rigid*	spite*	ticked	vulture*
anguish*	crude*	distrust*	fright*	horr*	luckless*	pained	risk*	stammer*	timid*	war
annoy*	cruel*	disturb*	frustrat*	hostil*	ludicrous*	painf*	rotten	stank	tortur*	warfare*
antagoni*	crushed	domina*	fuck	humiliat*	lying	paining	rude*	startl*	tough*	warred
anxi*	cry	doom*	fucked*	<b>hurt*</b>	<b>mad</b>	pains	ruin*	steal*	traged*	warring
apath*	crying	dork*	fucker*	idiot	maddening	panic*	<b>sad</b>	stench*	tragic*	wars
appall*	cunt*	doubt*	fuckin*	ignor*	madder	paranoi*	sadde*	<b>stink*</b>	trauma*	weak*
apprehens*	<b>cut</b>	dread*	fucks	immoral*	maddest	pathetic*	sadly	strain*	trembl*	weapon*
argh*	cynic*	dull*	fume*	impatien*	maniac*	peculiar*	sadness	strange	trick*	weep*
argu*	damag*	dumb*	fuming	impersonal	masochis*	perver*	sarcas*	stress*	trite	weird*
arrogan*	damn*	<b>dump*</b>	furious*	impolite*	melanchol*	pessimis*	savage*	struggl*	trivi*	wept
asham*	danger*	dwel*	fury	inadequa*	<b>mess</b>	petrif*	<b>scare*</b>	stubborn*	troubl*	whine*
assault*	daze*	egotis*	geek*	indecis*	messy	pettie*	scaring	stunk	turmoil	whining
asshole*	decay*	embarrass*	gloom*	ineffect*	miser*	petty*	<b>scary</b>	stunned	<b>ugh</b>	whore*

attack*	defeat*	emotional	goddam*	inferior*	miss	phobi*	sceptic*	stuns	ugl*	wicked*
aversi*	defect*	empt*	gossip*	inhib*	missed	piss*	scream*	<b>stupid*</b>	unattractive	wimp*
avoid*	defenc*	enemie*	grave*	insecur*	misses	piti*	screw*	stutter*	uncertain*	witch
awful	defens*	enemy*	greed*	insincer*	<b>missing</b>	pity*	selfish*	submissive*	uncomfortabl*	woe*
awkward*	degrad*	enrag*	grief	insult*	mistak*	poison*	serious	suck	uncontrol*	<b>worr*</b>
<b>bad</b>	depress*	envie*	griev*	interrup*	mock	prejudic*	seriously	sucked	uneas*	worse*
bashful*	depriv*	envious	grim*	intimidat*	mocked	pressur*	seriousness	sucker*	unfortunate*	worst
bastard*	despair*	envy*	<b>gross*</b>	irrational*	mocked*	prick*	severe*	sucks	unfriendly	worthless*
battl*	desperat*	evil*	grouch*	irrita*	mocking	problem*	shake*	sucky	ungrateful*	<b>wrong*</b>
beaten	despis*	excruciat*	grr*	isolat*	mocks	protest	shaki*	suffer	unhapp*	yearn*
bitch*	destroy*	exhaust*	guilt*	jaded	molest*	protested	shaky	suffered	unimportant	
bitter*	destruct*	fail*	harass*	jealous*	mooch*	protesting	shame*	sufferer*	unimpress*	
blam*	devastat*	fake	harm	jerk	moodi*	puk*	shit*	suffering	unkind	
bore*	devil*	fatal*	harmed	jerked	moody	punish*	shock*	suffers	unlov*	
boring	difficult*	fatigu*	harmful*	jerks	moron*	rage*	shook	suspicio*	unpleasant	
bother*	disadvantage*	fault*	harming	kill*	mourn*	raging	shy*	tantrum*	unprotected	
<b>broke</b>	disagree*	fear	harms	lame*	murder*	rancid*	sicken*	tears	unsavo*	

Note: The twenty-five most commonly used negative emotion words by children from the natural setting transcriptions are in bold.

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