Maternal Expressive Style and Children's Emotional Development

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Abstract:

Maternal expressive styles, based on a combination of positive and negative expressive patterns, were identified at two points in time and related to multiple aspects of preschool children's emotional development. Mother–child pairs from 260 families participated when the children were 3 years old, and 240 participated again at aged 4 years. Expressive styles were identified at age 3 using cluster analysis, replicated at age 4 and examined in relation to children's emotional understanding, expressiveness and regulation. Three expressive styles were identified: high positive/low negative, very low positive/average negative and average positive/very high negative. Cluster membership was stable in 63% of families from age 3 to 4 years; no systematic patterns of change were evident in the remaining families. Expressive style was related to aspects of children's emotional expression at 3 years and to emotion expression and regulation at 4 years. Children's expressiveness and regulation at age 3 were also related to changes in mothers' expressive styles over 1 year. Identifying mothers' expressive styles provides a unique way to understand the potential role of the emotional climates in which preschool-aged children learn to express and regulate their own emotions

Keywords: emotional climate | positive expressiveness | negative expressiveness | emotion knowledge | emotional expression | emotion regulation

Article:

Parents are typically regarded as the primary socializers of their children's development in multiple domains (Grusec & Davidov, 2007; Harkness & Super, 2002), including children's emotional competence (Eisenberg, Cumberland, & Spinrad 1998; Morris, Silk, Steinberg, Myers, & Robinson, 2007). With increasing recognition of the importance of emotional development to children's social and psychological functioning (Denham, Bassett, & Wyatt 2007; Eisenberg *et al*., 1998) has come expanded interest in the family as the premier context in which early

emotional development occurs. One pervasive aspect of parents' emotional socialization is their own expressiveness (Halberstadt, Cassidy, Stifter, Parke, & Fox 1995).

Parents' expressiveness exposes children to numerous emotions, which may increase their ability to interpret the meaning of emotions in various situations (Eisenberg *et al*., 1998). Although this suggests that exposure to both positive and negative expression may enhance children's emotional development, frequent anger or harshness in the home may over-arouse children thus preventing them from learning about, expressing and regulating emotions (Eisenberg *et al*., 1998). For preschool-aged children, expressive patterns in the home may have particularly important links to development as children create schemas and expectations about the world (Dunsmore & Halberstadt,1997).

Expressiveness, defined as a predominant and persistent style of exhibiting verbal and nonverbal emotional expressions (Halberstadt *et al*., 1995), has been assessed in two ways: as a global measure of the frequency and intensity of all kinds of emotion, or separately by positive and negative valence. Previous research has provided theoretical justification for considering positive and negative expressiveness as two distinct dimensions (Halberstadt, 1986; Halberstadt *et al*., 1995). In fact, positive and negative expression are often unrelated (Burrowes & Halberstadt, 1987), underscoring their independent contributions to a parent's expressive style.

The potential importance of parental emotional expressiveness to children's emotional development has been examined in relation to three commonly assessed indicators: children's emotion understanding, emotional expression and emotion regulation (Denham *et al*.,2007; Scharfe, 2000). Generally, this line of research has yielded conflicting results. One example of inconsistent findings appears in research on the association between positive and negative emotional expressiveness and children's emotion understanding. Some researchers have found that children of parents who express more positive emotion have an increased understanding of emotions, but parental expression of negative emotion is unrelated to children's emotion knowledge (Camras *et al*., 1990; Halberstadt *et al*., 1999). Other researchers have found evidence that children of parents who express more negative emotion show lower emotion knowledge but report no relation between parents' positive expressiveness and children's emotion knowledge (Denham, 1997). Halberstadt and Eaton (2002) conducted a meta-analysis of this body of research and found evidence for a small association between negative expressiveness and lower emotion understanding, although the studies reviewed included children at a wide range of ages and only a limited number using preschool-aged samples.

Similarly, associations between positive and negative emotional expressiveness in the family and children's expressiveness have also been inconsistent. Generally, parents who display a lot of positivity have children who are also positive in their expressiveness (Camras *et al*., 1990; Cassidy, Parke, Butkovsy, & Braungart, 1992; Isley, O'Neil, Clatfelter, & Parke, 1999) Results are more complex for parents' expression of negative emotion. Mothers' expression of negative emotion has been associated with *less* positive expression by children in one study (Garner &

Power, 1996), and *more* positive expression in another (Cassidy *et al*., 1992). It has also been suggested that mothers and children tend to display similar amounts of negative emotion during play, whereas father–child dyads tend to display dissimilar amounts (Isley *et al*., 1999). Halberstadt and Eaton's (2002) meta-analysis reported a moderate relation between positive expressiveness of parents and positive expressiveness of children across 19 studies and a very small association between parents' and children's negative expressiveness across 17 studies.

The same pattern of inconsistency is found in the few studies examining the association between parental emotional expressiveness and children's emotion regulation abilities. Emotion regulation is a multidimensional construct, which includes behavioural and biological components (Calkins, 1994). It is typically assessed through parents' reports, observations of regulatory strategies and physiological measures of children's parasympathetic nervous system functioning through respiratory sinus arrhythmia withdrawal, or what Porges (1991, 1996) has termed heart rate variability vagal tone. Mothers' positive expressiveness has been linked to children's increased use of positive regulatory strategies, and mothers' negative expressiveness, particularly expression of sadness, has been related to less emotion regulation in children (Eisenberg *et al*., 2001; Garner, 1995). However, other researchers have found no association between mothers' expression of positive emotion and children's regulation abilities (Ramsden & Hubbard, 2002).

One possible reason for the inconsistent findings in past work may be that the association between positive and negative expressiveness has rarely been considered empirically. That is, most previous analyses have not identified whether families high on positive expressiveness display high negative expressiveness, average negative expressiveness or low negative expressiveness in the home. This is quite different from the analysis of total expressiveness, where the levels of positive and negative expressiveness are simply added together. Instead, a useful approach would be to examine both dimensions separately but simultaneously so as to obtain a clearer and more precise description of the expressive climate in the home.

An interesting example of considering the association between positive and negative expressiveness is Fosco and Grych's (2007) study of children's appraisal of interparental conflict. The authors tested the interaction of positive and negative expressiveness and used median splits to illustrate how four family groups based on low and high levels of positive and negative expressiveness related to children's self-blame. Children from homes high in negative expressiveness and low in positive expressiveness reportedly blamed themselves as the cause of parental conflict more than children from the other three groups (Fosco & Grych, 2007).

Although Fosco and Grych (2007) provide a clearer picture of how positive and negative expressiveness may be related in families, the use of median splits has limitations. To start, splitting continuous variables into dichotomous groups does not retain the maximum amount of information from the data (Whiteman & Loken, 2006). Families with expression levels close to the mean may fall just above or just below the median; although they may be more accurately

labelled ‘average’, they are instead considered ‘low’ or ‘high’, which creates questions regarding the validity of groups. Additionally, median splits force the researcher to make assumptions about appropriate groupings a priori (Whiteman & Loken, 2006). This can be acceptable when sufficient previous research has been conducted to clearly define theoretically meaningful groups. However, when little research has been carried out to define meaningful typologies, as is the case with research examining the relation between positive and negative expressiveness, a person-centred approach that allows group structure to be defined by the data is more fitting (Whiteman & Loken, 2006). One such approach is cluster analysis.

Our goal in the current study is to examine the combination of positive and negative expressiveness using cluster analysis to identify maternal expressive styles. The structure and number of clusters provides information about expressive grouping possibilities. Furthermore, the relation between these groupings and children's emotional development enables us to better understand the potential effects of consistent exposure to different styles of emotional expression. We expect to see groups emerge that are characterized by not only low and high levels of expressiveness but also by *average* levels. Theoretically, children require some amount of exposure to negative emotions in order to learn how to regulate, express and understand emotion (Denham *et al*., 2007; Eisenberg *et al*., 1998); thus, it is possible that average levels of negative expression are more beneficial than suggested by previous analytic techniques. Also, in the current project, we examine maternal expressive styles at two time points. Previous research has suggested that emotional expressiveness within families is stable (Halberstadt *et al*., 1995; Michalik *et al*., 2007), and we expect to find stability across a year. Further, the ability to replicate cluster groupings at two time points will provide additional evidence that the styles we identify are meaningful in characterizing maternal expressiveness.

Using longitudinal data from two time points within the preschool period, we will be able to examine predictions of change. The long-term significance of maternal expressive styles when children are 3 years old can be determined by examining whether it is related to increases or decreases in aspects of children's emotional competence over time. In one study, mothers' positive expressiveness was related to increases in children's empathy 2 years later (Zhou *et al*., 2002). In another, preschool children exposed to higher negative expressiveness in the home were more likely to be victimized by peers and aggressive in first grade than children who did not experience parents' high negative expressiveness (Burk *et al*., 2008). On the other hand, children's early emotional development at age 3 may be related to changes in mothers' expressivity. Children are thought to influence the emotion socialization environment (Cole & Tan, 2007; Eisenberg *et al*., 1998), and previous research has found that children's negativity and aggression relate to increases in parental negativity and decreases in emotional support over time (Verhoeven, Junger, van Aken, Deković, & van Aken, 2010; Zadeh, Jenkins, & Pepler, 2010).

In the current project, we address the following research questions: (i) Can maternal expressive styles be identified based on positive and negative dimensions of emotional expressiveness in the home?; (ii) How stable are maternal expressive styles over 1 year?; (iii) Do aspects of children's

emotional development differ by concurrent maternal expressive style?; and (iv) Is early maternal expressive style related to changes in children's emotional development over 1 year? And is children's early emotional development related to changes in maternal expressive style over 1 year?

METHOD

Participants

The participants in this project are part of a larger longitudinal study of early cognitive and emotional precursors to school success. Children were recruited from childcare centres and preschools in a mid-sized Southeastern city. Families were enrolled in the study when children were 3 years old; children and their mothers participated when children were 3 (Time 1) and 4 years of age (Time 2). Two custodial grandmothers are included as mothers in the present study. Of the 260 families with questionnaire data available at age 3, 244 returned for the 4-year visit (94% retention rate), and 240 families had questionnaire data available for the current analyses. There were no significant differences by child gender, χ^2 (1, $N = 256$) = .01, $p = .94$, maternal race, χ^2 (1, $N = 256$) = 3.34, $p = .07$ or family income-to-needs ratio (total family income divided by the poverty threshold for a particular family size), $t(254) = 1.43$, $p = .15$, between families who continued and those who did not have data available for Time 2 analyses. At Time 1, 52% of the children were female, and the average age of mothers was 33 years. Families were diverse in terms of ethnicity, income and family structure. Almost 40% of mothers were racial/ethnic minorities (31% African American, 2% Hispanic, 1% Asian American, 5% other or biracial); 37% of families had income-to-needs ratios less than 2.0, indicating low income, 53% had ratios of 2.0 to 5.0, and 10% had ratios greater than 5.0. Three-quarters (74%) of parents were married and living together.

Procedure

The laboratory visit lasted approximately 2 hours. Mothers provided written consent and completed questionnaires during the session. Children were videotaped while engaging in multiple tasks, with an experimenter and with their mothers, assessing emotional development. Families received $40 and $60 for the 3-year and 4-year visits, respectively, and children selected a toy as thanks for their participation.

Measures

Demographics

Mothers completed a demographic questionnaire including child gender and ethnicity, maternal age, parents' marital status and family income.

Maternal emotional expressiveness

Maternal emotional expressiveness was assessed at both time points using a self- report measure of the mother's emotional experience and expressive patterns. The short form of the Self-Expressiveness in the Family Questionnaire (SEFQ; Halberstadt *et al*., 1995) includes 24 items rated on a 9-point scale (1 = *not at all frequently*; 9 = *very frequently*). Mothers were asked to indicate the frequency of their positive and negative displays of emotion in the home environment. Two subscales, representing positive (e.g. '*Praising someone for good work*') and negative (e.g. '*Showing contempt for another's actions*') dimensions were used (Halberstadt *et al*., 1995). The SEFQ demonstrates adequate test–retest reliability and convergent, discriminant and construct validity (Halberstadt *et al*., 1995). Internal reliabilities (Cronbach's alphas) in the current sample for the positive and negative dimensions were .86 and .81, respectively at Time 1 and .86 and .82, respectively at Time 2. Positive and negative expressiveness were uncorrelated at Time 1, $r = -.12$, $p = .07$, and at Time 2,$r = -.09$, $p = .15$.

Emotion Knowledge

Children's knowledge of emotions was assessed at both time points in a series of laboratory tasks involving labelling emotions, affective perspective taking and identifying causes of emotions. The task procedures at each time point were identical.

Labelling emotions

Using puppet vignettes developed by Denham (1986), children were presented with four felt faces depicting happy, sad, angry and scared expressions. Children were asked to name each emotion and also to point to a face representing each requested emotion. Children received two points for a correct answer and one point for an answer of the correct valence (e.g., indicating sad instead of angry). The Pearson correlation between the receptive and expressive scores in the labelling of emotions task was .62 ($p < .01$) at Time 1 and .42 ($p < .01$) at Time 2. Scores on the eight receptive and expressive questions were summed within each time point to yield a measure of emotion labelling (alphas = .77 and .62 for Time 1 and Time 2, respectively) with scores ranging from 0 to 16.

Affective perspective taking

In the affective perspective taking task, children heard stories using puppets and were asked to pick the appropriate face for the emotion expressed in each situation (happy, sad, angry or scared; Denham, 1986). The first four stories were nonequivocal, meaning that the appropriate emotion for each story tends to be typical for all individuals. The next six stories were equivocal; each story could elicit one of two emotions. These six stories were presented to the child with the protagonist experiencing an emotion different from the emotion the child's mother reported would be typical for the child. Children received two points for a correct answer and one point for an answer of the correct valence. The possible range of scores was 0 to 8 for the nonequivocal stories and 0 to 12 for the equivocal situations with higher scores indicating stronger affective perspective taking skills. The Pearson correlation between the two was $r = .53$

($p < .01$) at Time 1 and $r = .43$ ($p < .01$) at Time 2. The nonequivocal and equivocal total scores were averaged to create an affective perspective taking aggregate with $\alpha = .68$ at Time 1 and $\alpha = .72$ at Time 2.

Identifying emotion causes

In the emotion causes task, children were asked to provide reasons for why a puppet character experiences each of four emotions (happy, sad, angry and scared) and were prompted to produce four responses for each emotion (Denham *et al*., 1994). Responses were coded from videotape for the number of accurate, independent causes given using established criteria (Barrett & Campos, 1987; Stein & Jewett,1986). An emotion causes total score was computed as the number of valid explanations across all four emotions. The possible range of scores is from 0 to 16. Approximately 25% of the videotapes ($n = 64$) were coded independently by two coders. Agreement between the coders on whether each response included in the total score was accurate or inaccurate was calculated using Cohen's Kappa to account for chance; the kappa statistic was .63 at Time 1 and .63 at Time 2.

Similar to Denham and Kochanoff (2002), scores for each task (emotion labelling, affective perspective taking and emotion causes) were standardized then summed to create an emotion knowledge aggregate. The Pearson correlations between the three tasks ranged from .45 to .50 at Time 1 and from .30 to .43 at Time 2 (all *p's* < .01).

CHILDREN'S EXPRESSION OF EMOTION

Children's emotional expression was assessed at both time points through observational measures of the frequency with which children used emotion words scored during two mother–child interaction episodes, and through parent-report questionnaire measures of the child's positive and negative affectivity.

Use of Emotion Words

The frequency with which children used positive and negative emotion words was measured at each lab visit during two mother–child tasks, one in which the mother and child read a book together and one in which the mother and child played a board game together. For the mother–child book reading task, mothers were asked to ‘read’ the child two age-appropriate picture books depicting emotional situations; the books contained minimal words. For the board game task, mothers and children played a board game designed specifically for this study to elicit meta-cognitive planning. The tasks were videotaped and later coded by trained coders for the frequency of mental state language by the mother and by the child using procedures outlined by Jenkins, Turrell, Kogushi, Lollis, and Ross (2003). Separate positive (e.g. happy, love) and negative (e.g. sad, hurt, upset) scales were used. The child's positive and negative emotion word totals were calculated by summing the count for each valence from the mother–child book reading task and the mother–child board game task. The totals were prorated by total time spent

in these activities to create a score that represented the frequency of positive and negative emotion words used per five-minute period. Approximately 25% of the videotapes ($n = 61$) were coded independently by two coders. Inter-observer agreement was calculated as the Pearson correlations between the two coders' frequency counts; $r = .93$ ($p < .01$) positive emotion words at Time 1, $r = .62$ ($p < .01$) positive emotion words at Time 2, $r = .97$ ($p < .01$) negative emotion words at Time 1 and$r = .87$ ($p < .01$) negative emotion words at Time 2.

Positive Affectivity

The Surgency scale from the Children's Behavior Questionnaire short form (CBQ-Short; Putnam & Rothbart, 2003) was used to assess the child's positive affectivity. The CBQ is a 94-item parent-report measure that assesses temperament in 3- to 7-year-olds. Mothers described their children's typical reactions to various situations on a 7-point Likert scale ranging from 1 (*extremely untrue of your child*) to 7 (*extremely true of your child*). The Surgency subscale score, computed as the average of 12 items from the very short form measuring the narrow temperament dimensions of impulsivity, high intensity pleasure, activity level and shyness (reverse scored) was taken as the measure of positive affectivity in the present analyses. Mothers completed the questionnaire during each laboratory visit. Internal reliability for the Surgency scale is .67 at Time 1 and .69 at Time 2.

Negative Affectivity

Two measures of the child's negative affectivity are the negative affect subscale from the CBQ (Putnam & Rothbart, 2003) and the Lability/Negativity subscale of the Emotion Regulation Checklist (ERC; Shields & Cicchetti, 1998). The Negative Affect scale from the CBQ-Short is computed as a mean of 12 items measuring the anger/frustration, sadness, fear, discomfort and falling reactivity/soothability (reverse scored) narrow dimensions of temperament. Internal reliability for the Negative Affect scale is .64 at Time 1 and .71 at Time 2. In the ERC, mothers rated how frequently their child engaged in negatively reactive behaviours on a scale from 1 (*never*) to 4 (*always*). The lability/negativity subscale consists of 15 items (alpha = .82 and .81 at Time 1 and Time 2, respectively). The CBQ Negative Affect subscale and the ERC negativity subscale were moderately to highly correlated at Time 1 ($r = .47$, $p < .01$) and Time 2 ($r = .45$, $p < .01$); therefore, the scores were standardized and summed to create a measure of negative affectivity.

EMOTION REGULATION

The child's emotion regulation ability was assessed at both time points using both a parent-report questionnaire and physiological measures. This was carried out to account for the fact that emotion regulation has been shown to manifest at both the behavioural and physiological levels (Thompson, Lewis, & Calkins, 2008).

Parent Report

The Emotion Regulation subscale (8 items; e.g. '*My child responds positively when adults talk to or pay attention to him/her*') of the ERC (Shields & Cicchetti, 1998) was used as a measure of emotion regulation. Internal reliability in the current sample for the Emotion Regulation subscale was .60 at Time 1 and .56 at Time 2.

Physiological Measures

Physiological measures of the child's cardiac activity were collected to assess vagal suppression, the child's ability to maintain an internal parasympathetic balance during emotionally arousing situations (Calkins, 1997; Porges, 1991). Two disposable paediatric electrodes were placed on the child's body connecting to a preamplifier. The output from these measurements was processed for R wave detection through a vagal tone monitor (Series 2000 Mini-Logger, Mini Mitter Co., Inc. Bend, OR) and edited using Cardio Batch/Edit software (Brain-Body Center, University of Illinois at Chicago, Chicago, IL). Following Porges (1985), respiratory sinus arrhythmia was calculated every 30 seconds during a baseline period while the child watched a short video and during two frustration-eliciting tasks. In one of the frustration-eliciting tasks, the child was asked repeatedly to draw a perfect circle while receiving criticism from the experimenter for each attempt. The second frustrating task varied from Time 1 to Time 2 to avoid an exposure effect. During the Time 1 assessment the child was asked to open a lock to retrieve a desired toy, although none of the keys provided to the child were correct. At Time 2, the child was asked to unravel a string attached to a puzzle that unbeknownst to the child had been knotted tightly and glued into the puzzle. To calculate the measure of vagal tone suppression, the mean vagal tone during the two frustrating situations was subtracted from the baseline vagal tone measurement (see Calkins, 1997). Children with higher vagal tone suppression are considered more successful at regulating their emotional arousal (Calkins, 1997).

RESULTS

Preliminary Analyses

Preliminary analyses included examining the frequencies and distributions of all study variables. Means, standard deviations, and ranges of study variables can be seen in Table 1. Potential covariates were explored following the identification of maternal expressive styles.

Table 1. Descriptives for study variables

	Time 1, 3 years			**Time 2, 4 years**				
	M	**SD**	**Range**	***M***	**SD**	**Range**	**Test–retest *r***	***t***
Maternal emotional expressiveness								

	Time 1, 3 years			Time 2, 4 years				
	M	**SD**	**Range**	***M***	**SD**	**Range**	**Test–retest *r***	***t***
Positive expressiveness	53.18	6.10	32–60	52.74	6.04	23–60	.46**	−.05
Negative expressiveness	26.84	6.61	12–50	26.86	6.61	15–51	.61**	.01
Knowledge of emotions	.06	2.38	−6.94–5.53	0	2.28	−10.12–3.58	.63**	−.13
Expression of Emotions								
Use of positive emotion words	.09	.13	0–.83	.18	.24	0–2.27	.08	6.01**
Use of negative emotion words	.14	.17	0–1.31	.27	.37	0–3.40	.01	6.99**
Positive affectivity	4.58	.72	2.58–6.75	4.65	.72	2.08–6.42	.69**	1.99*
Negative affectivity	–.01	1.72	−3.98–5.30	.00	1.70	−4.98–4.66	.74**	.02
Regulation of emotions								
Emotion regulation	3.38	.34	2.13–4	3.46	.31	2.63–4	.54**	3.38**
Vagal tone suppression	.95	.69	−1.53–2.72	1.07	.66	−.64–2.89	.37**	1.61

*p < .05.
**p < .01.

Maternal Expressive Style Cluster Identification, Replication and Stability

The first goal of the current study was to identify maternal expressive styles using cluster analysis. This exploratory approach was used as opposed to an a priori classification because positive and negative expressiveness have not commonly been grouped to develop expressive style profiles. Additionally, cluster analysis enabled us to consider multiple dimensions of

continuous data. Replication of the clusters was tested using split sample and *k*-means replication procedures, as suggested by previous research (Whiteman & Loken,2006). The cluster solution was then tested on the same sample 1 year later, and the stability of each family's cluster membership over time was evaluated.

For the Time 1 data, positive expressiveness and negative expressiveness were standardized and used as clustering variables. The most common clustering strategy, hierarchical agglomerative cluster approach, was chosen as the algorithm from which individuals would be paired (Whiteman & Loken, 2006). The cosine similarity index accounting for shape, elevation and scatter was used to detect profile differences (Cronbach & Gleser, 1953), and the average linkage method was used so that each individual would have a greater mean similarity to individuals in the same cluster group than to individuals in other cluster groups (Sneath & Sokal, 1973). After examining the dendogram, it appeared that three clusters existed in the current sample. A one-way analysis of variance based on a three-cluster solution for positive and negative expressiveness described the following three styles (see Table 2): *high positive/low negative* (HP/LN; $n = 123$), mothers with high levels of positive expressiveness and low levels of negative expressiveness; *very low positive* (VLP; $n = 70$), mothers with very low levels of positive expressiveness and average levels of negative expressiveness; and *very high negative* (VHN; $n = 67$), mothers with average levels of positive expressiveness and very high levels of negative expressiveness. Each group was significantly different from the other two on both measures of expressiveness; in other words, the mean levels of positive expressiveness and negative expressiveness were unique to each maternal expressive style.

Table 2. Means and standard deviations of cluster variables

	Time 1, 3 years			**Time 2, 4 years**		
	High positive/low negative (*n* = 123)	**Very low positive (*n* = 70)**	**Very high negative (*n* = 67)**	**High positive/low negative (*n* = 108)**	**Very low positive (*n* = 62)**	**Very high negative (*n* = 70)**
	***M* (SD)**	***M* (SD)**	***M* (SD)**	***M* (SD)**	***M* (SD)**	***M* (SD)**
Positive	.64 (.38)	−1.26 (.82)	.19 (.60)	.68 (.43)	−1.20 (.90)	.00 (.68)
Expressiveness	[57.07 (2.34)]	45.49 (5.00)]	[54.34 (3.63)]	[56.81 (2.60)]	[45.48 (5.43)]	[52.74 (4.13)]
Negative	−.63 (.59)	−.05 (.71)	1.21 (.73)	−.54 (.63)	−.36 (.64)	1.14 (.77)
Expressiveness	[22.66 (3.93)]	[26.53	[34.81	[23.36 (4.17)]	[24.47	[34.41

Time 1, 3 years			Time 2, 4 years		
High positive/low negative (*n* = 123)	**Very low positive (*n* = 70)**	**Very high negative (*n* = 67)**	**High positive/low negative (*n* = 108)**	**Very low positive (*n* = 62)**	**Very high negative (*n* = 70)**
***M* (SD)**	***M* (SD)**	***M* (SD)**	***M* (SD)**	***M* (SD)**	***M* (SD)**
	(4.71)]	(4.81)]		(4.25)]	(5.07)]

Note. Positive and negative expressiveness are standardized. Unstandardized values can be seen on the following line in brackets.

Because of the subjectivity involved in choosing the correct number of clusters, recommended replication procedures were followed to determine whether the same three-cluster solution with similar positive and negative expressiveness profiles could be produced (Whiteman & Loken, 2006). In the split sample procedure, a second hierarchical agglomerative cluster analysis using the procedures described earlier was conducted on a random 50% of the sample. The three-cluster solution with very similar expressiveness profiles was replicated. Additionally, the *k*-means cluster method, which is recommended only for replication purposes because of the fact that the researcher must specify the number of clusters (Blashfield & Aldenderfer, 1988), was used to obtain a three-cluster solution. Again, the same three expressiveness profiles were produced. These replication procedures therefore confirmed the three-cluster maternal expressive style solution as the best fit to the data at Time 1.

The next task was to determine if the same maternal expressive styles would be seen in the sample 1 year later, and if so, how stable cluster membership would be. The *k*-means cluster method was used to assess whether the three-cluster profile fit the sample again at Time 2 (Blashfield & Aldenderfer, 1988). Results indicated that the Time 1 solution fit the sample 1 year later with the following profiles (see Table 2): HP/LN ($n = 108$), VLP ($n = 62$) and VHN ($n = 70$). There is one difference to note between the Time 1 clusters and the Time 2 clusters. At Time 2, the HP/LN group and the VLP group were not significantly different from one another on negative expressiveness. Negative expressiveness in the VLP group dropped to a value slightly below average, suggesting that this maternal expressive style may be characterized by an overall low level of affect expression in addition to its very low positive distinction. In light of this difference from Time 1, the dendogram at Time 2 was examined; the three-cluster solution was still most appropriate.

The stability of membership was then examined (see Table 3). Of the 240 mothers with data available at both times, 152 mothers (63.3%) remained in the same cluster group after 1 year. Of the 88 mothers (36.7%) who changed in expressive style, all possible change patterns between

the groups were represented fairly equally, forming five small groups each containing fewer than 20 mothers; therefore, no further analyses were conducted to examine specific patterns of change. The association between Time 1 and Time 2 cluster membership was tested using a chi-square test of independence; the two cluster variables were significantly related meaning that they are dependent in the sample, χ^2 (4, $N = 240$) = 88.43, $p < .01$.

Table 3. Time 1 expressive style by Time 2 expressive style cross tabulation

			Time 2 expressive style			
			HP/LN	**VLP**	**VHN**	**Total**
Time 1 expressive style	HP/LN	Count	79	19	15	113
		% of Total	32.9	7.9	6.3	47.1
	VLP	Count	16	34	16	66
		% of Total	6.7	14.2	6.7	27.5
	VHN	Count	13	9	39	61
		% of Total	5.4	3.8	16.3	25.4
	Total	Count	108	62	70	240
		% of Total	45	25.8	29.2	100

Note. HP/LN, high positive/low negative; VLP, very low positive; VHN very high negative.

Identification of Covariates

To determine whether demographic factors needed to be included as covariates in the analyses, we examined the relation between demographics and maternal expressive styles at Time 1 and emotional development indicators at Time 1 and Time 2. Ethnicity (coded as white or non-white) was the only demographic variable that was significantly related to both expressive style at Time 1 and at least one aspect of children's emotional development. Knowledge of emotions at both time points and vagal tone suppression at Time 1 was higher among white children than non-white children. In addition, the child's height and weight were included as covariates in analyses of emotion regulation because of the influence of body size on children's cardiac vagal tone. Thus, ethnicity was controlled for in all analyses examining relations between expressive climate

and emotional development; height and weight were also included as controls in analyses of emotion regulation.

To further explore the relation between maternal expressive style and ethnicity, we conducted a chi-square test of independence among European American and African American mothers. Maternal expressive style was significantly related to maternal ethnicity, χ^2 $(2, N = 240) = 8.77$, $p < .05$. Follow-up chi-square goodness of fit tests were conducted for each cluster group to identify specific cell differences. Ethnicity frequencies were significantly different than what we would expect based on our sample frequencies in the VHN cluster group, χ^2 $(1, N = 61) = 4.8$, $p < .02$, with fewer African American families in this cluster ($n = 12$) than expected ($n = 21$) and more white families ($n = 49$) than expected ($n = 40$).

Maternal Expressive Style and Children's Emotional Development

After establishing maternal expressive styles, our next goal was to determine the significance of these styles for children's emotional development. We conducted analyses of covariance (ANCOVA) for each emotional development domain (MANCOVAs in the case of expression and regulation of emotions) to identify significant differences between maternal expressive styles and aspects of children's emotion understanding, expression, and regulation at Time 1 (3 years). Ethnicity was included as a covariate in all analyses, and child height and weight in regulation analyses. These analyses were followed up by analyses of variance (ANOVA) and Tukey post hoc tests. Separate analyses were conducted for Time 1 and Time 2 data to examine concurrent relations.

Results for Time 1 are shown in Table 4. A significant difference by maternal expressive style was found for children's expression of emotions, $F(8,470) = 4.73$, $p < .01$. Two of the indicators of expression of emotions were significant: the child's use of positive emotion words and negative affectivity. Post hoc tests showed more frequent use of positive emotion words in children of HP/LN mothers compared with those of VLP mothers and higher negative affectivity for children of VHN mothers compared with children of HP/LN and VLP mothers.

Table 4. Means and standard deviations of children's emotional development by maternal expressive style at Time 1

	High positive/low negative (*n* = 108)	**Very low positive (*n* = 62)**	**Very high negative (*n* = 70)**		
	***M* (SD)**	***M* (SD)**	***M* (SD)**	***df*, Error*df***	***F***

	High positive/low negative (*n* = 108)	**Very low positive (*n* = 62)**	**Very high negative (*n* = 70)**		
	***M* (SD)**	***M* (SD)**	***M* (SD)**	***df*, Error*df***	***F***
Knowledge of emotions	.00 (2.24)	−.03 (2.41)	.25 (2.59)	2, 252	.29
Expression of emotions					
Use of positive emotion words	.58 (.76)$_a$	.30 (.55)$_b$	.40 (.53)$_{a,b}$	2, 245	3.88*
Use of negative emotion words	.78 (.86)	.69 (1.02)	.59 (.63)	2, 245	1.10
Positive affectivity	4.54 (.76)	4.60 (.67)	4.64 (.70)	2, 245	1.53
Negative affectivity	−.49 (1.72)$_a$	−.01 (1.54)$_a$	.87 (1.56)$_b$	2, 245	14.89**
Regulation of emotions					
Emotion regulation	3.43 (.34)	3.30 (.35)	3.38 (.29)	2, 229	2.61
Vagal tone suppression	.86 (.72)	.97 (.61)	1.04 (.72)	2, 229	1.17

Note. Means in the same row that do not share subscripts differ at $p < .05$ in the Tukey honestly significant difference comparison.
*$p < .05$.
**$p < .01$.

At Time 2 (Table 5), two aspects of children's emotional development, expression of emotions, $F(8,456) = 2.75$, $p < .01$, and regulation of emotions, $F(4,350) = 3.17$, $p < .05$, differed

by maternal expressive style. For expression of emotions, significant differences were found for negative affectivity. Post hoc tests showed higher reported negative affectivity in children of VHN mothers compared with children of HP/LN and VLP mothers. For emotion regulation, the parent-report measure of emotion regulation differed by expressive style with children of VLP mothers reported to show lower emotion regulation than children of HP/LN and VHN mothers.

Table 5. Means and standard deviations of children's emotional development by maternal expressive style at Time 2

	High positive/low negative (*n* = 123)	**Very low positive (*n* = 70)**	**Very high negative (*n* = 67)**		
	***M* (SD)**	***M* (SD)**	***M* (SD)**	***df*, Error*df***	***F***
Knowledge of emotions	−.02 (2.32)	−.19 (2.69)	.18 (1.82)	2, 238	.44
Expression of emotions					
Use of positive emotion words	.19 (.21)	.16 (.21)	.18 (.30)	2, 238	.18
Use of negative emotion words	.29 (.37)	.21 (.27)	.31 (.45)	2, 238	1.11
Positive affectivity	4.66 (.73)	4.63 (.68)	4.65 (.76)	2, 238	.09
Negative affectivity	$-.38\ (1.74)_a$	$-.11\ (1.70)_a$	$.67\ (1.47)_b$	2, 238	8.61^{**}
Regulation of emotions					
Emotion regulation	$3.52\ (.28)_a$	$3.31\ (.31)_b$	$3.49\ (.32)_a$	2, 184	6.06^{**}
Vagal tone	1.09 (.62)	1.08 (.79)	1.02 (.62)	2, 184	.38

	High positive/low negative ($n = 123$)	Very low positive ($n = 70$)	Very high negative ($n = 67$)		
	M **(SD)**	***M*** **(SD)**	***M*** **(SD)**	***df*****, Error*****df***	***F***
Suppression					

Note. Means in the same row that do not share subscripts differ at $p < .05$ in the Tukey honestly significant difference comparison.
**$p < .01$.

Longitudinal Predictions of Change in Maternal Expressive Style and Children's Emotional Development

The first set of longitudinal analyses tested whether early maternal expressive style was related to changes in children's emotional development over time. We conducted analyses of covariance (ANCOVA) for each emotional development domain (MANCOVAs in the case of expression and regulation of emotions) to identify significant differences between maternal expressive styles at Time 1 in predicting aspects of children's emotion understanding, expression, and regulation at Time 2 controlling for children's emotional development at Time 1, ethnicity, and child height and weight in regulation analyses. The analyses were again followed up by analyses of variance (ANOVA) and Tukey post hoc tests. Results revealed that maternal expressive style at Time 1 was not related to changes in children's emotion understanding, expression, or regulation.

The second set of longitudinal analyses examined whether aspects of children's early emotional development were related to changes in maternal expressive styles over time. We conducted multinomial logistic regression analyses with the HP/LN expressive style as our reference group for each emotional development domain. We tested whether children's emotion understanding, expression, and regulation at Time 1 were related to maternal expressive styles at Time 2 controlling for maternal expressive styles at Time 1, ethnicity and child height and weight in regulation analyses. Children with higher negative affect at Time 1 were more likely to have VHN mothers than HP/LN mothers at Time 2 even after accounting for maternal expressive style at Time 1. For every unit change in child negative affect, the odds of mothers changing to the VHN group by Time 2 over changing to the HP/LN group increased by $\exp(.28) = 1.32$. Additionally, children with higher maternal-reported emotion regulation at Time 1 were more likely to have HP/LN mothers than VLP mothers at Time 2 even after accounting for maternal expressive style at Time 1. For every unit change in emotion regulation, the odds of mothers changing to the HP/LN group by Time 2 over changing to the VLP group increased by $\exp(1.89) = 6.62$. And finally, children with higher vagal tone suppression at Time 1 were more likely to have HP/LN mothers than VHN mothers at Time 2 after accounting for maternal

expressive style at Time 1. For every unit change in vagal tone suppression, the odds of mothers changing to the HP/LN group by Time 2 over changing to the VHN group increased by $\exp(.72) = 2.05$.

DISCUSSION

In this study, cluster analysis was used to incorporate both positive and negative dimensions of maternal emotional expressiveness into a single analysis while also retaining the use of continuous data on both dimensions. This is a more cohesive approach than previous work on emotional expressiveness and provides a more complete picture of the expressive patterns mothers use in the home.

A three-cluster solution fit the data, thus describing three distinct maternal expressive styles. The most common expressive style at both time points measured, representing approximately half of the sample, described mothers expressing high amounts of positive emotion and low amounts of negative emotion. Based on previous research showing positive child outcomes for families with high positive expressiveness and negative child outcomes for families with high negative expressiveness (e.g. Camras *et al.*, 1990; Eisenberg *et al.*,2001), and the findings reported here, this expressive style appears to be the most supportive of positive emotional development in children. At 3 years, the children in the present study whose mothers had a high positive/low negative style used more positive emotion words during mother–child interaction tasks than mothers with a very low positive expression style and were reported to exhibit less negative affectivity than mothers with a very high negative expression style. At 4 years, children of high positive/low negative mothers were again reported to exhibit less negative affectivity than mothers with a very high negative expression style and also to have better emotion regulation ability than mothers with a very low positive expression style.

The other half of mothers at Time 1 were divided somewhat equally between those who expressed very low amounts of positive emotion with average negative emotion and those who expressed very high amounts of negative emotion with average positive emotion. Previous research has not been clear as to whether an expressive environment that is very low in positive emotion or very high in negative emotion would be more detrimental to children's development of adequate emotional skills. The current findings provide evidence that both types of environments can be problematic, but results varied depending on the specific aspect of emotional development under consideration.

At aged 3 years, children whose mothers' expressive style was very low positive used significantly fewer positive emotion words during the mother–child interaction observations and at age 4 were reported to have the poorest emotion regulation skills compared with all other children. These findings are consistent with prior research (Cassidy *et al.*, 1992; Isley *et al.*, 1999) and a number of theoretical perspectives. From a social learning perspective, children are not likely to talk about positive feelings if these emotions are not frequently modelled in the

home. From a conditioning or behaviour modification perspective, children of very low positive mothers are not likely to be rewarded for positive emotion or encouraged to share their positive feelings openly and thus may be less likely to do so. Support for the link between low positive expressiveness and poor emotion regulation ability has not been consistently reported in previous research. This association was apparent in the present study at Time 2 only, and at this time low positive mothers were also low in negative expressiveness. An overall low amount of affectivity in the home may not provide children with a regulation model or give children the opportunity to practise regulating their own feelings; the fact that this combination of very low positive and low negative expressiveness has not been specifically examined in previous research may help explain the inconsistency in earlier results related to emotion regulation.

Children whose mothers' expressive style is characterized by very high negative expressiveness, on the other hand, were reported to display significantly more negative affectivity at both time points compared with all other children. This finding can also be explained from a social learning perspective. Mothers with very high negative expression, in addition to average positive expression, may be characterized by volatility, conflict, and high overall affect. The measures of negative affectivity include mood swings, angry reactivity and affective intensity, characteristics the child has likely experienced. There is also evidence that aspects of temperament and regulation have a genetic basis (see Goldsmith & Lemery-Chalfant, 2008), suggesting heritability of negative characteristics from parents to their children. Previous findings for a link between parents' and children's negative expressiveness have been largely mixed, with a meta-analysis on this topic reporting only a very small association (Halberstadt & Eaton, 2002). Examining the combination of positive and negative expressiveness may again be an advantage, as the link between mothers' and children's negative affect was seen for mothers displaying very high negative and average positive emotion, an interesting combination of high overall affect that is not captured when examining dimensions separately.

Interestingly, maternal ethnicity was significantly related to maternal expressive style at Time 1. The very high negative cluster was more uneven than we would expect based on the sample demographics, with white mothers making up 75% of the group and just over 60% of the sample. This finding tends to suggest that the African American sample in this study reported displaying less affect than the European American sample overall, especially concerning the display of negative emotions. Although additional research with the goal of identifying racial differences in emotion socialization is needed to understand these findings, this is somewhat consistent with prior research suggesting that a history of oppression has encouraged African Americans to limit their expression of emotions, particularly negative emotions, despite their cultural traditions of expressive oral communication (Boykins, 1986; Consedine & Magai, 2002; Plasky & Lorion,1984). African American parents may anticipate the more severe negative consequences their children will face for openly expressing their negative emotions compared with European American children by using socialization practices that discourage their children's negative expression (Leerkes & Siepak, 2006; Montague, Magai, Consedine, & Gillespie, 2003). In the

current study, African American mothers may be modelling limited expressiveness for their children as a form of emotion socialization.

Two kinds of longitudinal analyses were conducted using data when children were 3 years and 4 years of age. Consistent with previous research, children in the current study were found to influence their emotion socialization environment. Three-year-olds' negativity and difficulty regulating emotions as indexed by low vagal tone suppression was related to a higher likelihood that their mothers would transition into a VHN expressive style versus a HP/LN style over the period of 1 year. Similarly, three-year-olds' emotion regulation difficulties as reported by mothers were related to a higher likelihood that their mothers would move into the VLP group versus the HP/LN group from age 3 to age 4. Children who are highly negative and have trouble controlling their negative feelings are more difficult for parents to care for. The stress associated with caring for a difficult child may have depleted mothers' emotional resources causing them to be either less patient or less engaged in emotional events at home. Interestingly, there was no evidence in the current study that early maternal expressive style related to changes in children's emotional development over 1 year. Most aspects of children's emotional development were highly stable; therefore, it is possible that more change was needed for maternal expressive style to predict later emotional development above and beyond what was already associated at age 3. In fact, children's negative affectivity, which was the only outcome that was related to maternal expressive style at 3 years, had the highest stability coefficient of all outcomes at .74.

Overall, the maternal expressive styles examined in the current study were related to multiple aspects of children's expression of emotion and to mothers' reports of their child's emotion regulation ability. However, links between expressive style and children's emotion knowledge were not found either concurrently or longitudinally, despite previous research linking positive and negative expressiveness with children's emotion knowledge (Denham, 1997; Halberstadt *et al*., 1999). It may be that parental emotion socialization strategies that utilize direct teaching about emotion-eliciting situations and increase opportunities to interact with others and develop perspective-taking skills may be more important to the development of emotion knowledge than observing parents' expression. Research linking positive interactions with siblings to higher emotion knowledge supports this idea (Brown & Dunn, 1996).

The present study also investigated the stability of maternal expressive styles. By replicating maternal emotional style groups across a year, we can conclude that the expressive styles established in the present study appear to be meaningful descriptions of maternal expressiveness. A majority of mothers remained in the same cluster grouping over a year and high correlations across time revealed that groups had high rank-order stability. But that is not to say that mothers were not mobile to some degree. The fact that mothers who changed cluster membership tended to do so in all possible directions may be seen as encouraging for children with very low positive mothers. Long-term negative effects on expression of emotion and regulatory abilities are not inevitable if mothers are able to change and low positive mothers begin to express more positive affect.

There are limitations to the current study that lead directly into opportunities for future research. First, positive and negative emotional expressiveness was assessed through mothers' reports of their own expressive behaviours in the home. Although questionnaires regarding home behaviour are often used in a laboratory interviews, direct observations of mothers' expressiveness in a natural setting may have produced different findings. It is also possible that for some families, fathers or other adults living in the home may have different expressive patterns than those reported by mothers (Halberstadt *et al*., 1995). Information from fathers was not available from the current sample, but future research should consider the expressive contributions of other family members and assess an overall expressive climate. Second, with the exception of children's use of positive emotion words, indicators of children's emotional development that were related to mothers' expressive styles were obtained by mother report. The significant associations may reflect common-method variance and be somewhat attributable to characteristics of the mothers themselves. However, problems related to this limitation should not be overestimated because the mother-report measure used to assess children's emotion regulation is commonly used in other studies where associations with maternal reports of emotional expressiveness have not always been found (Ramsden & Hubbard, 2002). Similarly, maternal depressive symptoms may have contributed either to true increases in negative affect, or to a tendency to over-report negative affect in the home environment. Future research should disentangle parents' expressiveness from depressive symptoms using a variety of methods beyond self-report. Third, it is important for readers to keep in mind that labels given to describe maternal styles, such as very low positive or very high negative, are based on relative levels of these variables. The range of positive and negative expressiveness in the current sample may be different than ranges collected from other samples. Also, we were unable to examine factors associated with patterns of change in cluster membership from 1 year to the next because of the large number of different patterns and small cell sizes. This is an important question for future research, especially if researchers or practitioners aim to intervene with mothers displaying problematic expressive styles. Identifying change patterns will likely be easier to uncover when more time points are available, leading to our next limitation and direction for future research. Two time points were available from the current sample; more complex patterns of developmental change can be examined with additional assessments. And finally, the current study is limited by its use of the SEFQ short form, which includes a small number of submissive negative items (e.g. sadness). Thus, it was not possible to effectively separate submissive and dominant negative expressions here, but future research should explore this interesting distinction using the extended questionnaire.

The current study provides a new way of examining an area of research that has produced inconsistent results in the past. We employed multiple methods including observation, laboratory tasks, parent report and physiological assessments to understand children's emotional development. Additionally, we utilized a more holistic and complete approach to the study of maternal emotional expressiveness, including both positive and negative expression to categorize expressive styles. Considering two of the three clusters included average levels on one of the

expressive domains, research examining solely high or low levels of emotional expressiveness may be missing an important aspect of parental emotion. This more comprehensive approach is likely to yield useful information for intervention as well as a more complete picture of the links between maternal emotional expressiveness and children's outcomes.

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