DOCUMENT RESUME

ED 263 994 PS 015 458

AUTHOR Denham, Susanne A.
TITLE Maternal Emotional Responsiveness and Its Relation to Toddlers' Social-Emotional Competence and Expression of Emotion.
PUB DATE Apr 85
NOTE 45p.; An abridged version of this paper was presented at the Biennial Meeting of the Society for Research in Child Development (Toronto, Ontario, Canada, April 25-28, 1985). For a related document, see PS 015 462.
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Affective Behavior; Affective Measures; *Emotional Response; Imitation; *Interpersonal Competence; *Mothers; Naturalistic Observation; *Parent Child Relationship; Socialization; *Toddlers

ABSTRACT

Preschoolers' expression of various emotions and overall social-emotional competency may be related to mothers' emotional responsivemness to children's emotions. This research investigated, through extended naturalistic observation, (1) how maternal emotion displays differ according to antecedent child emotion (happy, sad, angry, or afraid) and (2) the prediction of particular emotions expressed by the child and of ratings of the child's social-emotional competence (when the mother was absent) by prevalence of maternal emotions, maternal responses to the child's emotion, and maternal psychosocial functioning. Subjects were 29 mother-toddler pairs. Multiple regression analyses showed that an aggregate of maternal emotional dialogue components, maternal current functioning, and/or prevalent maternal emotions were efficient predictors, in combination, of children's various emotions and of children's social-emotional competence. Implications regarding the mother-child affective environment, socialization of emotion and social competency, and developmental methodology are discussed. (Author/DST)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)
X This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

ED263994

Maternal Emotional Responsiveness and its Relation To Toddlers' Social-Emotional Competence and Expression of Emotion

Susanne A. Denham

University of Maryland Baltimore County

PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Susanne A. Denham
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

PS 015458

This research represents a part of the author's doctoral dissertation; an abridged version of this paper was presented at the 1985 biennial meeting of the Society for Research in Child Development. Grateful acknowledgement goes to Drs. Marian Radke-Yarrow and Carolyn Zahn-Waxler for their gracious assistance during many phases of this work. Reprints may be requested from the author, Department of Psychology, George Mason University, 4400 University Drive, Fairfax VA 22030

Running Head: MATERNAL EMOTIONAL RESPONSIVENESS

Abstract

Preschoolers' expression of various emotions and overall social-emotional competency may be related to mothers' emotional responsiveness to the child's emotions. Thus this research investigated, via extended naturalistic observation: (1) how maternal emotion displays differ according to antecedent child emotion; and (2) the prediction of particular emotions expressed by the child and of ratings of the child's social-emotional competence (when the mother was absent) by prevalence of maternal emotions, maternal responses to the child's emotion, and maternal psychosocial functioning. Subjects were 29 mother-toddler pairs. Systematic emotional dialogue does exist between mothers and children at this age level. Multiple regression analyses showed that an aggregate of maternal emotional dialogue components, maternal current functioning, and/or prevalent maternal emotions were efficient predictors, in combination, of children's various emotions and of children's social-emotional competence. Implications regarding the mother-child affective environment, socialization of emotion and social competency, and developmental methodology are discussed.

Maternal Emotional Responsiveness and its Relation To Toddlers' Social-Emotional Competence and Expression of Emotion

Maternal responsiveness to infants and children has been operationalized in various ways (e.g., Brady & Caldwell, 1976; Brazelton, Kozlowski, & Main, 1974; Main, Tomasini, & Tolan, 1979; Zahn-Waxler, Radke-Yarrow, & King, 1979). These global conceptions of maternal responsiveness are often related to prosocial reactions to distress, positive play, proximity to peers, and other socially competent behaviors (Bakeman & Brown, 1980; Clarke-Stewart, Vander Stoep, & Killian, 1979; Zahn-Waxler et al., 1979).

Theory has, however, been vague regarding which specific parental variables affect children's social-emotional competence, and by what process. Specific dimensions of maternal responsiveness affecting children's specific behaviors may have been obscured by the use of rating scales; such scales capture the global, decontextualized quality of maternal responsiveness, but do not specify behaviors and behavioral processes (Cairns & Green, 1979). Furthermore, research has only infrequently examined the relationship of even globally measured maternal

BEST COPY AVAILABLE

emotional responsiveness to children's expression of emotions, despite recent measurement innovations (e.g., Izard & Dougherty, 1982; Lewis & Michalson, 1983).

One possible framework to use in specifying the developmental antecedents of both social-emotional competence and emotional expression stems from Izard's (1977) theory of differential emotions. Another can be gleaned from microanalytic studies of mother-infant interaction.

It is Izard's contention that quite specific information about self and other, rather than only valence and intensity, is coded by the expression of a particular emotion. The whole experience of expressing emotions and having them responded to both emotionally and behaviorally is thus theoretically of enormous significance for the child. Emotions organize social knowledge, mediate cognition, and communicate the nature of, and expressive behavior appropriate to, particular social situations (Campos & Barrett, 1983; Cummings, Zahn-Waxler, & Radke-Yarrow, 1981; Klinnert, Campos, Sorce, Emde, & Svejda, 1983; Thompson & Lamb, 1983).

Microanalytic naturalistic studies of mother-infant interaction have also addressed the issue of socialization of emotion. The affective dialogue

between mother and baby has been described (Bakeman & Brown, 1977; Brazelton et al., 1974; Kaye & Fogel, 1980). Whether focusing on specific behaviors, such as looking, smiling, and vocalizing (Cohn & Tronick, 1982) or on the general cycling of affective valence (Stern, 1974), these studies show that mother-infant emotional synchrony and reciprocity are operative by three months of age. Mothers react in specific ways to infants' various emotional displays (Frodi, Lamb, Leavitt, & Donovan, 1978; Malatesta and Haviland, 1982).

Although the quality of such mother/infant affective dialogue has been related to the child's later cognitive and social competence (Bakeman & Brown, 1980; Beckwith & Cohen, 1980; Clarke-Stewart et al., 1979), research has most often focused on the early months of life. It is likely, however, that the emotional dialogue between mother and child, and its importance, continues after twelve months of age, and differs according to the child's age and the specific emotion under investigation (Izard & Buechler, 1981).

It would therefore be fruitful to examine mothers' specific emotional responsiveness to children's emotions. A mother's reaction to a child's happiness is, for example, undoubtedly different from that to anger.

BEST COPY AVAILABLE

BEST COPY AVAILABLE

Microanalytic study could be used profitably within the framework of discrete emotions theory to show the existence of emotional dialogue in toddlerhood and the relations of specific maternal emotional responsiveness indices to toddlers' social-emotional development.

Maternal psychosocial functioning may be another, broader, but still affectively specific, way of operationalizing the likely affective environment of the child. Mothers' current functioning (stress from life events, amount of social support, and mood) has been shown to be quite important in determining the affective environment (Aneshensel & Frerichs, 1982; Baldwin, Baldwin, Cole & Kokes, 1983; Bell, Leroy, & Stevenson, 1982). For example, stressful life events and negative affect are negatively related to maternal responsiveness, whereas positive social support lessens the effect of stress on maternal responsiveness (Crnic, 1983).

Regardless of whether research is from a microanalytic or current functioning perspective, affective environment is seen to be related to children's social-emotional competence. Research with affectively disordered mothers, who presumably react sub-optimally to their offspring's emotions, or

mothers who are experimentally unavailable emotionally, has indicated that their children react non-adaptively to emotional displays in their environment, may be unsympathetic to distressed peers, and cope poorly with stress themselves (Cohn & Tronick, 1982; Cole, Baldwin, Baldwin, & Fisher, 1983; Sameroff, Seifer, & Zax, 1982; Sorce & Emde, 1981; Zahn-Waxler, Cummings, McKnew, & Radke-Yarrow, 1984). More precise descriptions of the acaptiveness of various maternal reactions to children's specific emotions are not, however, available.

Thus the present study is concerned with the following hypotheses: (1) Emotional dialogue: Maternal emotional displays closely following each of their child's emotions (happy, sad, angry, or afraid) will differ according to the child's emotion; the converse will also be true; and (2) Prediction of children's expression of emotions and social-emotional competency: Current functioning indices and unconditional probabilities of maternal emotions, as well as conditional probabilities of certain maternal emotional responses to the child's specific emotions, will efficiently predict unconditional probabilities of the child's emotions and ratings of the child's social-emotional competency.

BEST COPY AVAILABLE

Method

Subjects

Subjects were 29 middle-SES (based on education and occupational status) Caucasian normal mother-toddler dyads drawn from a childrearing study of children of depressed and non-depressed women (Radke-Yarrow, Kuczinski, Zahn-Waxler, Cytryn, McKnew, Cummings, & Iannotti, 1982). Children were 25 to 39 months old (mean age = 31 months). There were 15 girls and 14 boys. Their siblings, who were usually 6-7 years old, were also involved tangentially in hypothesis two.

Non-disordered mothers were chosen from among the affectively disordered and normal mothers involved in the larger study. The mothers in this study had ne had any psychiatric diagnosis of major depression, as specified by both the Schedule for Affective Disorders and Schizophrenia (SADS ; Spitzer & Endicott, 1978) and Research Diagnostic Criteria categories (RDC; Spitzer, Endicott, & Robins, 1980).

Procedure

Subjects came to the laboratory on four separate half-day occasions. During these sessions they spent much of the time in an apartment-like setting. The

BEST COPY AVAILABLE

apartment is very home-like, including kitchen, toys, television, and other objects typically found in these toddlers' home environments.

Conditions and facilities allowed for and encouraged usual daily routines, demands, and interactions between mother and child (e.g., eating, playing, resting, etc.). A number of experimental situations were, however, interposed within the rhythm of each day, such as a stranger's arrival and mother's departure for a short time, and the visit of a "doctor". Approximately 400 minutes of videotapes, spanning all four sessions, were record for each family.

Measures and Data Analysis

Hypothesis One, Emotional Dialogue. Data for the first hypothesis were extracted from codings of emotions displayed by both mother and child. Continuous real-time coding was made, via an exhaustive and mutually exclusive system, of various emotional displays (i.e., evidence of a specific happy, sad, angry, tense/afraid, tender, neutral, or "other" emotion via facial, vocal, gestural, and/or postural means). Tender displays, called a combination pattern of emotion by Izard (1977), were included since they were predicted to be particularly salient in social-emotional development (Lewis and Michalson, 1983).

BEST COPY AVAILABLE

BEST COPY AVAILABLE

Emotional display data were coded for the following time periods from the second videotaped session: a typically unpleasant experience, the "doctor situation" (10 minutes, including anticipation after doctor arrives and the physical examination itself), and a typically positive experience, eating lunch with mother (first 10 minutes).

The measures of emotion used in this study were not so microscopic as to capture facial expression changes occurring over fractions of a second (cf. Ekman & Friesen, 1978; Izard & Dougherty, 1982). Although such measurement systems are important, the coding definitions for this study were structured to capture the socially meaningful unit ongoing, multi-modally defined emotion displays (Lewis & Michalson, 1982).

Inter-observer reliability, based on 15.6% of the total observation time across subjects, was 87 percent agreement. Kappa/Kappa Max (Cohen, 1960) equalled .83. Most errors were of omission rather than commission; i.e., one rater would code an emotion when the other rater coded neutral, rather than each coding a different emotion (error of commission). There were no significant mean differences for any emotion category for reliability subjects.

Unconditional probabilities of emotions, conditional probabilities of emotions after the partner's emotions, and associated binomial Zs were derived from event and time data from the above systems (at time lag 1 second or event lag 1). Lags greater than one were not investigated here. Sackett's (1979, 1980) lag sequential Zs indicate whether or not one behavior follows another at a probability significantly greater or less than its unconditional probability in the overall distribution.

Profiles of Z-scores across subjects in hypothesis one can be analyzed via the sum Z test (Sackett, 1979, 1980). If the ratio (sum Z / square root N) is significant when referred to the normal distribution, the null hypothesis that the average z is zero can be rejected, and the hypothesis that the original contingencies were homogeneous is confirmed.

Hypothesis Two: Prediction of the Child's Expression of Emotion and Social-Emotional Competence

Data for maternal current functioning included self-reported moods, mothers' perception of social interactions' quality and number of problem events (on the day preceding her second visit to the laboratory). Moods were assessed by the Profile of Mood States

BEST COPY AVAILABLE

(POMS; McNair, Lorr, & Droppelman, 1980) which gives scales for Happiness, Calmness, Confidence, Clear-mindedness, Energy, and Aggreeableness. Coders also rated mothers on dimensions including happiness, anxiety, acceptance of their toddler, and responsiveness during videotaping on day two (Finn's r = .72). The current functioning aggregate equalled the sum of standard scores for [% positive interaction - % negative interaction - perceived problems + ratings for maternal happiness, calmness, responsiveness, and acceptance of child]. Reliability of aggregate as assessed by Cronbach's alpha = .47. The mood aggregate was created by summing Z's for the POMS scales as above.

Given that there are 30 Zs derived in hypothesis one (six maternal emotions X 5 emotions of the child), and the small sample size size, aggregation was important to summarize those results of hypothesis one to use in hypothesis two. Further, sequential zs may be highly context-specific, especially more so than current functioning or prevalent emotion variables. Thus an aggregate of positive emotional responsiveness,

BEST COPY AVAILABLE

BEST COPY AVAILABLE

hereafter called the sequential aggregate, was created.
13

This aggregate of positive responsiveness is as follows:

Sequential aggregate = $\underline{Z}$ (neutral to anger)

- $\underline{Z}$ (immediate tender to afraid) + $\underline{Z}$ (happy to angry)

- $\underline{Z}$ (tense to anger) - $\underline{Z}$ (immediate happy matching).

The content of the sequential aggregate reflects the following views of optimal or sub-optimal responsiveness. Optimal responses to anger would be calm neutrality or happy displays (e.g., "joking the child out of it"), whereas a non-optimal response to the child's anger would be maternal tension. Immediate (time sequential, within one second) $\underline{Z}$s for happy matching and tenderness to fear were considered non-optimal since such swift responses may denote maternal tension and social desirability. Further, there is some evidence that immediate tenderness to fear is neither developmentally normative nor appropriate at this age (Brooks-Gunn & Lewis, 1983). Another criterion for the sequential aggregate was the inclusion of each emotion (except sadness, expressed by very few mothers).

Ratings of the child's social-emotional competence were gleaned from observation of certain videotaped situations in which the toddler was left without the mother and had to interact with other people (a sibling, "stranger," or child psychiatrist).

BEST COPY AVAILABLE

These situations were observed using Lewis & Michalson's (1983) emotional profiles as behavioral anchor points from which to make global ratings. Behaviors observed included those indicating happiness, fear, anger, negative affiliation, positive affiliation, and competence.

More global ratings of the child's competency were derived from the scores on these profiles, for the following dimensions: ability to regulate emotions in stressful situations, ability to positively influence other person (ability to both give and getting social "goods"), and overall social competence. Ratings of the child's happiness, calmness, cooperativeness, social competence, play competence, and outgoingness, were also made of the whole second session. All ratings were made on seven point scales. The overall social competence aggregate equalled the sum of standard scores for all social-emotional competence indices mentioned above (positively weighted--e.g., Lewis and Michalson's fear scale was subtracted from the total). Reliability of aggregate as assessed by Cronbach's alpha = .94.

Finn's r was calculated as an index of reliability in which chance is absolute (less sensitive to marginal totals than percentage agreement, intraclass

correlation, or kappa; see Finn, 1970; Whitehurst, 1984). Finn's r corresponds to the proportion of between-rater correspondence in ratings which is not due to chance. This index ranged from .72 to .99 for children's social-emotional competency ratings included in the aggregate, and was .98 for the independent ratings of the child in the second session.

Hierarchical regression analyses were used to predict the social-emotional competence aggregate and unconditional probabilities of the child's emotions for several strategic reasons. First, the method is preferable to the simultaneous method when there is a logical priority for ordering the predictor variables under consideration (i.e., broader affective environment, as operationalized by current functioning or unconditional probability of emotion, then more context-specific affective environment, as operationalized by binomial Zs). Second, since it can specify unique contribution of each independent variable included as a separate step in the analysis, this is the method of choice for partitioning the total variance (Cohen & Cohen, 1975; Tabachnick & Fiddell, 1982).

BEST COPY AVAILABLE

BEST COPY AVAILABLE

Results

Hypothesis One, Emotional Dialogue

Child tender displays were extremely infrequent, constituting 0.4% of children's emotional displays in these data, and were thus not analyzed; similarly, the "other" emotion category was sufficiently infrequent that it was not included in sequential analyses.

Table 1 shows the results of sum Z tests for children's and maternal emotions as behaviors and responses. Many of the contingencies are in fact significant, often in interpretable ways.

Insert Table 1 here

Happy emotional displays from either interactor were likely to be matched (Zs = 3.22 and 2.72 for maternal and child's responses, respectively). Mothers were unlikely to be happy after child's sad displays (Z = -2.57), but were likely to be angry (Z = 2.65) or neutral (Z = 2.05). Mothers were likely to match child's angry displays (Z = 1.96) , and were not happy in response to anger (Z = -1.64). Children's fear was overwhelmingly followed by tenderness from mother (Z = 6.15). Mothers tended to be happy or tense after

BEST COPY AVAILABLE

BEST COPY AVAILABLE

children's neutral displays at a somewhat greater probability than expected ($\underline{Z}$s = 1.68 and 1.61, respectively), but not tender ($\underline{Z}$ = -2.14) or angry ($\underline{Z}$ = -1.79).

Children in this sample were unlikely to be sad or angry after maternal happy displays, as can be seen in Table 2 ($\underline{Z}$s = -2.51 and -2.40, respectively). Maternal anger resulted, inexplicably, in a lessening of child's fear ($\underline{Z}$ = - 2.78). Overall, children were neutral after maternal tenseness ($\underline{Z}$ = 2.77); often maternal tenseness was low level, coded via subtle bodily cues. After maternal tenderness, children continued fear ($\underline{Z}$ = 6.48), and were unlikely to be neutral ($\underline{Z}$ = -3.59). Children were neutral less frequently than expected after maternal neutral events ($\underline{Z}$ = -4.50), and more likely than expected by chance to be sad ($\underline{Z}$ = 2.53).

Insert Table 2 here

Hypothesis Two, Prediction of the Child's Expression of Emotion and Social-Emotional Competence

As shown in Table 3, the sequential aggregate is significantly positively related to the children's competence and prevalence of their happy displays, and

BEST COPY AVAILABLE

significantly negatively related to prevalence of children's sad displays. Of six correlations with the sequential aggregate, three are significant (even non-significant rs are nearly so, with the predicted sign).

Insert Table 3 here

The sequential aggregate has been validated with an independent global rating of appropriateness of response to children's emotions. It is significantly related to ratings of appropriateness of maternal response to positive and negative emotions (r = .48 and .52, $p < .05$ and .01, respectively) and to their standard scores' sum (r = .59, $p < .01$).

The sequential aggregate was also positively correlated with prevalence of maternal happy displays, and negatively related to prevalence of maternal anger and tension (r's = .55, -.62, and -.46, ps < .01, .01, and .06, respectively). These relations validate the usefulness of this aggregate; not only do its components relate to child competence indices and to independent ratings, but they are related to unconditional probabilities of maternal emotion in explainable ways. It is also clear in Table 3 that this aggregate is

significantly related to the social-emotional competence aggregate.

Insert Table 4 here

Regression Analyses. Table 4 gives regressions of maternal current functioning aggregate and the sequential aggregate on the social-emotional competence aggregate. As can be seen, maternal current functioning and the type of interaction defined by the sequential aggregate were in fact good predictors of children's social-emotional competence. Similar but somewhat less strong results were found when children's competence was predicted by prevalence of maternal anger and tension expressed after children's anger. Thus context-specific responsiveness variables, whether specified by the sequential aggregate or by the specific Z of tension after the child's anger, contribute to the significant R-squared even after variance shared with more global operationalizations of affective environment (i.e., maternal current functioning or unconditional probability of specific maternal emotions) was partialled out.

Insert Tables 5-7 here

Tables 5 through 8 include regression analyses predicting prevalence of the unconditional probabilites of children's various emotions. Because of highly significant relations between unconditional probabilities of specific maternal and children's emotions (Denham, 1985), unconditional probabilities of maternal emotions were generally used as predictors instead of maternal current functioning. Also, one predictor based specifically on maternal reaction to the child's emotion (e.g., appropriateness global rating, sequential aggregate, or specific sequential z-score) was included in each analysis. Variables entered on the same step were considered to be of similar importance theoretically and/or practically.

In the prediction of unconditional probability of child's happy displays, age was partialled out at the first step since it is highly negatively related to the criterion. Unconditional probability of maternal happiness and globally rated responsiveness were significant predictors even after age was partialled out, yielding a substantial multiple R. The incremental

F for the set of variables entered at step 2 (prevalence of maternal anger, current functioning aggregate, and rating of appropriateness of response to positive child emotions) is significant [F (1,22) = 7.86, p < .03].

As seen in Table 6, unconditional probability of child's sadness was fairly efficiently predicted from prevalence of maternal anger and the sequential aggregate or the rating of appropriate response to distress. Table 7 shows that prevalence of child's anger was effectively predicted by the maternal mood aggregate and immediate tender response to child's fear predicted child's anger, when the variance shared with age was partialled out.

Prevalence of child's fear was effectively predicted by age and tender response to child's fear entered separately, in that order (R = .53, overall F = 4.65, p = .02). What this says, however, is only that, holding age constant, mothers who react most tenderly have the most fearful children, not a particularly astonishing finding. Potent contextual variables, namely the advent of a doctor, may be more predictive of children's fear in this setting than maternal variables.

BEST COPY AVAILABLE

BEST COPY AVAILABLE

Discussion

Hypothesis One, Emotional Dialogue

Regarding the socialization of emotion and social-emotional competence, there do indeed appear to be predictable responses that mothers in general make to children's emotional displays in this age range. Furthermore, there are predictable emotional responses that children make to maternal emotion displays at this age. These contingent responses are largely interpretable and meaningful; they specify emotional content of such dialogue. For example, both mothers and children frequently match each other's happy responses, and mothers react with tender emotion displays to child fear. One other interesting contingency was the likelihood that mothers follow child sadness with their anger. Interpreting this sequence requires an examination of the quality of responses beyond simple coding. That is, the child responses coded as sad here often seemed fussy and manipulative, and it seems that many mothers interpreted them similarly, responding with irritation.

What do these contingencies mean for the child? Malatesta's (1981) suggestions that mothers modulate the affect of their offspring, actually engaging in affect

coaching, are pertinent here. She suggests that mothers set schema for the learning of affect expression and control in several ways: (1) minimizing imitation; (2) maximizing imitation; (3) modulating imitation; (4) verbal interpretation, by use of both varying intonational patterns and discriminative verbal labels for affects. The contingencies seen in this study between maternal and child emotion expression can fit this framework, in that mothers appear to be maximizing happy responses (in that they strongly match them), minimizing angry responses through their angry-but-controlled matching responses, and modulating (i.e., trying to change) fear responses with tenderness, for example

Hypothesis Two, Prediction of the Child's Expression of Emotions and Social-Emotional Competency

The current functioning aggregate created from maternal reports and global ratings of maternal behavior were highly related to children's social-emotional competence indices; thus mother's report of social support and lack of stress, and ratings of her happiness, calmness, acceptance of her child, and responsiveness to her child, were related to the child's competence. Further, unconditional probabilities of

BEST COPY AVAILABLE

BEST COPY AVAILABLE

specific maternal emotions are related to maternal current functioning, providing validation of both sets of indices (Denham, 1985).

Sequential Aggregate. Group description indicates that mothers do match happy displays and show tenderness after child's fear. Individual difference predictions, on the other hand, demonstrate that being an outlier on these two interactional dimensions (e.g., with a $\underline{Z}$ > 4.00) is associated with negative outcomes for the child.

Thus because sequential $\underline{Z}$-scores are so tied to a specific context, they may describe distinct interactional processes well; for this very reason, however, no one sequential $\underline{Z}$ may appropriately summarize appropriate emotional responsiveness, psychosocial functioning, or organizational constructs of emotion (Cairns & Green, 1979; Campos, Barrett, Lamb, Goldsmith, & Stenberg, 1983). Aggregating these scores, as has been done here, may be necessary to globally capture the appropriateness of maternal response to child emotion in order to address the question posed in hypothesis two.

The sequential aggregate is positively related to child social-emotional competence and prevalence of positive emotions, and negatively to prevalence of

negative emotions (but not related to maternal current functioning). Aggregation forms an important part of this project.

Regression Analyses. The assertion was born out that both maternal current functioning (or unconditional probability of specific emotion) and response to child emotion predict child indices of social-emotional competence and unconditional probabilities of specific emotions. These child variables were efficiently predicted in easily interpretable ways. Thus knowledge of the general maternal affective environment and specific emotional interactional style predicts child's competency in a number of situations where mother is absent, as well as the unconditional probabilities of the child's various emotions. It is interesting that global ratings of responsiveness were, however, better predictors of unconditional probabilities of the child's emotions than was the sequential aggregate.

Further Research and Applied Considerations

Replication of findings such as these is always important. In future research, a larger sample size,

BEST COPY AVAILABLE

analysis of emotional dialogue at lags greater than one, and investigation of other contexts than lunch and a doctor's visit would be advisable.

Even given the need for replication, these findings also hold implications for persons working with parents and their children. First, interaction coaching could be conceptualized and attempted for mothers who are responding maladaptively to their children's emotions or who create a negative affective environment, similar to Field's (1982) recommendations for mothers of infants at risk and Malatesta's (1981) ideas on the techniques of socialization of emotion. Second, interventions aimed at changing parents' cognitive structures about parenthood and problem-solving process regarding dealings with their children could be implemented (e.g., what is important about emotional climate and how not to respond maladaptively to one's child's emotions; Newberger, 1983; Shure, 1981). Another way to assist mothers and children who are interacting non-adaptively is to bolster the social support/stress system of the mother and child, particularly where spouses can be involved, since their impact on the affective environment can be so great (Baldwin et al., 1983).

Conclusions

Several general methodological and theoretical points should be made. First, naturalistic, microanalytic methodology was quite useful in providing a group description of the emotional dialogue between mother and toddler and in delineating the individual differences ramifications of the child's affective environment. Second, use of Izard's (1977) differential emotions theory to operationalize variables also contributed to a clear, interpretable picture of socialization of emotion. This sucess even suggests ways to address other relatively untested theoretical approaches to social-emotional competence, such as Hoffman's (1975). Third, it is almost certainly the case that the use of aggregates (for child social-emotional competence, maternal current functioning, and especially sequential Z-scores) made individual difference findings stronger and clearer by the averaging out of error variance (Rushton, Brainerd, & Pressley, 1983). Such aggregation was particularly helpful in revealing systematicity within sets of variables derived from microanalytic observation. Fourth, the use of Lewis and Michalson's (1983) emotion profile system to rate social-emotional competency was

an innovation which resulted in valid, internally consistent assessments of child competencies. All of these successes can be very useful in further research on socialization of emotion.

References

Aneshensel, C.S., & Frerichs, R.P. (1982). Stress, support, and depression: A longitudinal causal model. Journal of Community Psychology, 10, 363-376.

Bakeman, R., & Brown, J.V. (1977). Behavioral dialogues: An approach to the assessment of mother-infant interaction. Child Development, 48, 195-203.

Bakeman, R. & Brown, J.V. (1980). Early interaction: Consequences for social and mental development at three years. Child Development, 51, 437-447.

Bakeman, R., & Dabbs, J.M. (1976). Social interaction observed: Some approaches to the analysis of behavior streams. Personality and Social Psychology Bulletin, 2, 335-345.

Baldwin, C.P., Baldwin, A.L., Cole, R.E., & Kokes, R.F. (1982). Family free-play interaction: The role of the patient in the family interaction. In A.L. Baldwin, R.E. Cole, & C.P. Baldwin (Eds.), Parental pathology, family interaction, and the competence of the child in school. Monographs of the Society for Research in Child Development, 47, (5, Serial No. 197), 45-59.

Beckwith, L., & Cohen, S.E. (1980). Interactions of preterm infants with their caregivers and test performance at age 2. In T.M. Field, S. Goldberg, D. Stern, & A.M. Sostek (Eds.), High risk infants and children: Adult and peer interactions (pp.155-178). New York: Academic.

Bell, R.A., Leroy,J.B., & Stevenson, J.J. (1982). Evaluating the mediating effects of social support upon life events and depressive symptoms. Journal of Community Psychology, 10, 325-340.

Bradley, R.H., & Caldwell, B.M. (1976). Early home environment and changes in mental test performance in children from six to thirty-six months. Developmental Psychology, 12, 93-97.

Brazelton, T.B., Koslowski, B., & Main, M. (1974). The origins of reciprocity: The early mother-infant interaction. In M. Lewis & L.A. Rosenblum (Eds.), The effects of the infant on its caregiver (pp. 49-76). New York: Wiley.

Brooks-Gunn, & Lewis, M. (1982). Affective interchanges between normal and handicapped infants and their mothers. In T. Field & A. Fogel (Eds.), Emotion and early interaction (pp. 161-188). Hilladale NJ: Lawrence Erlbaum Associates.

BEST COPY AVAILABLE

Cairns, R.B., & Green, J.A. (1979). How to assess personality and social patterns: Observations or ratings? In R.B. Cairns (Ed.), The analysis of social interactions (pp. 209-226). Hillsdale NJ: Lawrence Erlbaum Associates.

Campos, J.J., & Barrett, K.C. (1983). Toward a developmental theory of emotion. In C. Izard, J. Kagan, & R. Zajonc (Eds.), Emotion, cognition, and behavior (pp. 229-263). New York: Cambridge University Press.

Campos, J.J., Barrett, K.C., Lamb, M.E., Goldsmith, H.H., & Stenberg, C. (1983). Socioemtional development. In P.H. Mussen (Ed.), Handbook of child psychology: Vol. II, Infancy and developmental psychobiology (pp. 783-916). New York: Wiley.

Clarke-Stewart, K.A., Vander Stoep, L.P., & Killian, G.A. (1979). Analysis and replication of mother-child relation at two years of age. Child Development, 50, 777-793.

Cohen, J. (1960). A coefficient of agreement for nominal scales. Educational and psychological measurement, 20, 37-46.

Cohen, J., & Cohen, P. (1975). Applied multiple regression/correlation analysis for the behavioral sciences. New York: Lawrence Earlbaum Associates.

Cohn, J.F., & Tronick, E.Z. (1982). Communicative rules and the sequential structure of infant behavior during normal and depressed interaction. In E.Z. Tronick (Ed.), Social interchange during infancy: Affect, cognition, and communication. Baltimore: University Park Press.

Cole, R.E. Baldwin, A.L., Baldwin, C.P., & Fisher, L. (1982). Family interaction in free play and children's social competence. In A.L. Baldwin, R.E. Cole, & C.P. Baldwin (Eds.), Parental pathology, family interaction, and the competence of the child in school. Monographs of the Society for Research in Child Development, 47, (5, Serial No. 197), 60-71.

Cummings, E.M., Zahn-Waxler, C., & Radke-Yarrow, M. (1981). Young children's responses to expressions of anger and affection by others in the family. Child Development, 52, 1274-1282.

Denham, S.A. (1985, August). Affective environment and toddlers' social-emotional competence. Poster session presented at the annual meeting of the American Psychological Association, Los Angeles.

Ekman, P., & Friesen, W.V. (1978). The facial action coding system (FACS). Palo Alto CA: Consulting Psychologists Press (pp. 164-177). New York: Cambridge University Press.

Field, T.M. (1982). Interaction coaching for high-risk infants and their parents. In H.A. Moss, R. Hess, & C. Swift (Eds.), Early intervention programs for infants (pp. 5-24). New York: The Haworth Press.

Finn, R.H. (1970). A note on estimating the reliability of categorical data. Educational and psychological measurement, 30, 71-76.

Frodi, A.M., Lamb, M.E., Leavitt, L.A., & Donovan, W.L. (1978). Fathers' and mothers' responses to infant smiles and cries. Infant Behavior and Development, 1, 187-198.

Hoffman, M.L. (1975). Developmental synteais of affect and cognition and its implications for altruistic motivation. Developmental Psychology, 11, 607-622.

Izard, C.E. (1977). Human emotions. New York: Plenum.

Izard, C.E., & Buechler, S. (1981). Theoretical perspecitves on emotions in developmental disabilities. In M. Lewis & L. Taft (Eds.), Developmental disabilities in preschool children (pp. 353-369). New York: Spectrum Publications.

Izard, C.E., & Dougherty, L.M. (1982). Two complementary systems for measuring facial expression in infants and toddlers. In C.E. Izard (Ed.), Measuring emotions in infants and children (pp. 97-126). New York: Cambridge University Press.

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

Klinnert, M.D., Campos, J.J., Sorce, J.F., Emde, R.N., & Svejda, M. (1983). Emotions as behavior regulators: Social referencing in infancy. In R. Plutchik & H. Kellerman (Eds.), Emotion: Theory, research, and experience (Vol. 2, pp. 57-86). New York: Academic.

Lewis, M., & Michalson, L. (1983). Children's emotions and moods. New York: Plenum Press.

Main, M., Tomasini, L., & Tolan, W. (1979). Differences among mothers of infants judged to differ in security. Developmental Psychology, 15, 472-473.

Malatesta, C.Z. (1981). Infant emotion and the vocal affect lexicon. Motivation and Emotion, 5, 1-23.

Malatesta, C.Z., & Haviland, J.M. (1982). Learning display rules: The socialization of emotion expression in infancy. Child Development, 53, 991-1003.

McNair, D.M., Lorr, M., Droppelman, L.F. (1980). Profile of mood states. San Diego: Educational and Industrial Testing Service.

Newberger, C.M. (1978). Parental conceptions of children and child rearing: A structural-developmental analysis. (Doctoral Dissertation, Harvard University, 1977). Dissertation Abstracts International, 38, 6123B.

Radke-Yarrow, M., Kuczynski, L., Zahn-Waxler, C., Cytryn, L., McKnew, D., Cummings, E.M., & Iannoti, R. (1982). Affective disorders and affective development: A study of child rearing and child development in normal families and families with affective disorders (Research protocol). Bethesda MD: National Institutes of Mental Health.

Rushton, J.P., Brainerd, C.J., & Pressley, M. (1983). Behavioral development and construct validity: The principle of aggregation. Psychological Bulletin, 94, 18-38.

Sackett, G.P. (1979). The lag-sequential analysis of contingency and cyclicity in behavior interaction research. In J. Osofsky (Ed.), Handbook of infant development (pp. 623-649). New York: Wiley.

Sackett, G.P. (1980). Lag sequential analysis as a data reduction technique in social interaction research. In D.B. Sawin et al. (Eds.), Exceptional infant 4: Psychosocial risks in infant-environment transactions (pp.300-340). New York: Bruner Mazel.

Sameroff, A.J., Seifer, R., & Zax, M. (1982). Early development of children at risk for emotional disorder. Monographs of the Society for Research in Child Development, 47(7, Serial No. 199).

Shure, M.B. (1981). Social competence as a problem-solving skill. In D.J. Wine & M.D. Smye (Eds.), Social competence (pp. 158-185). New York: Guilford.

Sorce, J.F., & Emde, R.N. (1981). Mother's presence is not enough: Effect of emotional availability on infant exploration. Developmental Psychology, 17, 737-745.

Spitzer, P.L., Endicott, J., & Robins, E. (1980). Research diagnostic criteria (RDC) for a selected group of functional disorders. New York: New York Psychiatric Institute.

Spitzer, P.L., & Endicott, J. (1978). Schedule for affective disorders and Schizophrenia--Life-time version. In Biometric Research. New York: New York Psychiatric Institute.

Stern, D.N. (1974). Mother and infant at play: The dyadic interaction involving facial, vocal, and gaze behaviors. In M. Lewis & L.A. Rosenblum (Eds.), The effect of the infant on its caregiver (pp. 187-214). New York: Wiley.

Tabachnick, B.G., & Fiddell, L.S. (1983). Using multivariate statistics. New York: Harper & Row.

Thompson, R.A., & Lamb, M.E. (1983). Individual differences in dimensions of socioemotional development in infancy. In R. Plutchik & H. Kellerman (Eds.) Emotion: Theory, research, and experience (Vol. 2, pp. 87-114). New York: Academic.

Whitehurst, G.J. (1984). Interrater agreement for journal manuscript reviews. American Psychologist, 39, 22-28.

Zahn-Waxler, C., Cummings, E.M., McKnew, D., & Radke-Yarrow, M. (1984). Affective arousal and social interactions in young children of manic depressive parents. Child Development, 55, 112-122.

Zahn-Waxler, C., Radke-Yarrow, M., & King, R.A. (1979). Child rearing and children's prosocial initiations toward victims of distress. Child Development, 50, 319-330.

Table 1

Homogeneity and Magnitude of Z-scores: Maternal Emotions After Child Emotions[a]

Child's Emotions	Maternal Emotions After Child Emotions					
	Happy	Sad	Angry	Tense	Tender	Neutral
Happy	3.22*	-0.83	-0.30	-1.76	-1.38	0.64
Sad	-2.57*	1.10	2.65*	0.11	-1.14	2.05*
Angry	-1.64	-0.39	1.96*	-0.32	0.31	0.60
Afraid	-0.66	-1.17	-0.44	-1.14	6.15*	-2.59*
Neutral	1.68	1.30	-1.79	1.61	-2.14*	-0.12

[a] After Sackett's sum Z test (1979).

* $p < .05$, two-tailed.

Table 2

Homogeneity and Magnitude of Z-scores: Child Emotions After Maternal Emotions[a]

Maternal Emotions	Child's Emotions After Maternal Emotions				
	Happy	Sad	Angry	Afraid	Neutral
Happy	2.72*	-2.51*	-2.40*	-1.32*	1.92
Sad	-0.98	0.20	-0.94	-0.55	0.97
Angry	-0.46	0.90	0.06	-2.78*	1.36
Tense	-1.75	-0.46	-1.63	-0.50	2.77*
Tender	-1.82	-1.35	-0.82	6.48*	-3.59*
Neutral	1.71	2.53*	0.64	3.99*	-4.50*

[a] After Sackett's sum z test (1979).

* $p < .05$, two-tailed.

BEST COPY AVAILABLE

Table 3

Correlations of Sequential Aggregate and Current Functioning with Prevalence of Children's Emotions and Indices of Children's Social-Emotional Competency

	Maternal Variables	
Child Variables	Current Functioning	Sequential Agg.
Child Happy	.01	.58**
Child Sad	-.07	-.54*
Child Angry	.03	-.40
Child Afraid	-.13	-.28
Child Neutral	-.04	.20
Social-Emotional Aggregate	.46*	.63**

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

Table 4

Hierarchical Regressions of Maternal Current Functioning Aggregate and Sequential Aggregate on Child Social-Emotional Competence

Criterion Variable: Overall Social-Emotional Competence

Step	Variable Added	F (Beta)	Multiple R	R^2	Overall F
1	Current Func.	10.68*** (.67)	.672	.451	10.68***
2	Sequential Aggregate	4.79** (.41)	.780	.608	9.29***
1	Prevalence of Mat. Anger	4.66** (-.46)	.464	.215	4.66**
2	Mat. Tension After Anger	3.88* (-.45)	.607	.368	4.67**

[a] Entries in the R^2 column are cumulative; unique contributions of variables entered singly on a given step can be determined by subtracting the entry above from R^2 to give the increment in R^2.

* $p < .10$. ** $p < .05$. *** $p < .01$.

Table 5

Hierarchical Regressions of Maternal Variables on Prevalence of the Child's Happy Displays

Step	Variable Added	F (Beta)	Multiple R	R^2 [a]	Overall F
1	Age	9.57*** (-.53)	.526	.277	9.57***
2	Prevalence of Mat. Aanger	7.03*** (-.35)	.700	.489	10.26***
	Current Func.	2.27 (.20)	.746	.557	
	Appropriate Response to Child Positive Displays	5.93** (.34)	.807	.651	
1	Age	5.03** (-.53)	.528	.279	5.03**
2	Maternal Mood	0.08 (.07)	.533	.284	2.38
3	Sequential Aggregate	4.10* (.45)	.692	.479	3.36*

[a] Entries in the R^2 column are cumulative; unique contributions of variables entered singly on a given step can be determined by subtracting the entry above from R^2 to give the increment in R^2.

* $p < .10$. ** $p < .05$. *** $p < .01$.

Table 6

Hierarchical Regressions of Maternal Variables on Prevalence of the Child's Sad Displays

Step	Variable Added	F (Beta)	Multiple R	R^2 [a]	Overall F
1	Prevalence of maternal anger	2.52 (.38)	.379	.144	2.52
2	Sequential Aggregate	3.03* (-.50)	.544	.296	2.94*
1	Prevalence of maternal anger	9.33*** (.51)	.507	.257	9.33***
2	Appropriate Response to Child neg. emotions	5.18** (-.36)	.617	.380	7.98***

[a] Entries in the R^2 column are cumulative; unique contributions of variables entered singly on a given step can be determined by subtracting the entry above from R^2 to give the increment in R^2.

* $p < .10$. ** $p < .05$. *** $p < .01$.

Table 7

Hierarchical Regressions of Maternal Variables on Prevalence of the Child's Angry Displays

Step	Variable Added	F (Beta)	Multiple R	R^2 [a]	Overall F
1	Age	3.67 * (.38)	.358	.128	3.67 *
2	Maternal Mood	1.44 (-.23)	.421	.177	2.59 *
3	Tenderness after child fear (time seq.)	6.00 ** (.41)	.590	.348	4.08 **

[a] Entries in the R^2 column are cumulative; unique contributions of variables entered singly on a given step can be determined by subtracting the entry above from R^2 to give the increment in R^2.

* $p < .10$. ** $p < .05$. *** $p < .01$.

BEST COPY AVAILABLE