

What is maternal responsiveness?

The difference between maternal contingent responsiveness and maternal mirroring

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ABSTRACT

The study examined the relation between maternal contingent responsiveness and maternal mirroring behavior. Face-to-face interaction between mothers and their 5-month-old infants was scored for maternal mirroring behavior (exaggerated reflection of the infant's behavior either in the same or different modality), maternal vocal and smiling contingency, and mothers' and infants' vocal and smiling duration. Maternal mirroring was marginally related to maternal vocal contingency but unrelated to maternal smiling contingency. Infant vocal duration was related to maternal mirroring and was marginally related to maternal vocal contingency; but infant smiling duration was unrelated to maternal mirroring or smiling contingency. The data suggest that maternal vocal contingent responsiveness and mirroring behavior may be related but distinct. However, maternal responsiveness, whether as contingent responsiveness or mirroring, is distinct from durations of maternal smiling or vocalizing per se.



INTRODUCTION

The measurement of maternal responsiveness to infant behavior in face-to-face interactions has many variations in the literature, which can obscure our understanding of the concept. Here we examined two concepts, maternal *contingent responsiveness* and maternal *mirroring*. They often are used interchangeably, yet the extent to which they are similar has not been examined.

Both involve mothers' responses to infants' behavior that occur within a set time period, typically 1-3 seconds. However, they are measured differently. Contingent responsiveness is typically microcoded second-by-second for each partner separately and examines specific behaviors within a single modality. Scores for contingent behavior usually control for baseline frequencies of behaviors of interest. Mirroring behaviors are coded dyadically; mother's behavior is judged to match or slightly exaggerate the infant's behavior in affect and intensity. Mirroring behaviors can be within the same modality as the infant's behavior (e.g., mother mirrors the infant's smile with her own smile), or in a different modality (e.g., mother mirrors the infant's surprised facial affect with a vocal gasp). Baseline frequencies are not controlled for due to the multitude of behaviors potentially involved. Methods for measuring contingency and mirroring can vary from the methods defined below; thus, findings could be different with other measures of contingency or mirroring. Nevertheless, this study provides an initial comparison of the two concepts of maternal responsiveness.

METHOD

To examine the relation between maternal contingent responsiveness and mirroring behavior, both behaviors were coded in the same data set; both occurred within one second following infant behavior. Mothers and 5-month-old infants (N=31) engaged in a Still-Face Task. During periods of mutual gaze in the initial 2-minute baseline interactive phase, mothers' contingent smiling responsiveness (mother smiles within 1 second of infant smile), contingent vocal responsiveness (mother vocalizes within 1 second of infant vocalization), and mirroring behavior

(exaggerated reflection of the infant's behavior either in the same or different modality within 1 second of the behavior reflected) were scored. Maternal vocal and smiling contingency were calculated using limit of phi that controls for baseline frequencies. Maternal mirroring behaviors were reported as frequencies. The relation among maternal vocal and smiling contingency and mirroring behavior and mothers' and infants' vocal and smiling durations were also examined

RESULTS

Table 1a shows the correlations among maternal vocal contingency, maternal mirroring, and maternal and infant vocalization durations. Table 1b shows the correlations among maternal smiling contingency, maternal mirroring, and maternal and infant smiling durations.

Table 1.

Correlations among maternal contingency, maternal mirroring, and mothers' and infants' duration of vocalizations and smiling.

(a)	Maternal Vocal Contingency	Maternal Mirroring	Maternal Vocalizations
Maternal Vocal Contingency			
Maternal Mirroring	.348*		
Maternal Vocalizations	.175	.205	
Infant Vocalizations	.351*	.739**	.147

(b)	Maternal Smiling Contingency	Maternal Mirroring	Maternal Smiling
Maternal Smiling Contingency			
Maternal Mirroring	.177		
Maternal Smiling	.114	.038	
Infant smiling	.237	.107	.544 **

** $p < .01$, * $p < .10$

Maternal smile contingency and vocal contingency were unrelated ($p = .15$). Maternal mirroring was unrelated to maternal smiling contingency but was marginally related to maternal vocal contingency. Infant vocal duration was related to maternal mirroring, and was marginally related to maternal vocal contingency; but infant smile duration was unrelated to maternal mirroring or maternal smiling contingency.

CONCLUSION

Maternal mirroring behavior is a form of contingent behavior but it is distinct. Mothers who are highly contingent to their infants' behavior are not necessarily more likely to mirror their infants' behavior. Maternal mirroring behavior shows a stronger relation to maternal vocal contingency than to maternal smiling contingency. Both maternal mirroring behavior and maternal vocal contingency may be more noticeable to infants than maternal smiling contingency. Mirroring behaviors are salient to infants due to their exaggerated reflection of infants' behavior. Likewise, infants may recognize the contingency in their mothers' vocalizations readily compared to the contingency in their mothers' smiles. Mothers' smiles tend to overlap with infant smiles, yet mothers tend to stop talking when infants vocalize and resume talking after infants' vocalizations have ended, making maternal contingent vocalizations easier to detect. Infants also likely have more experience with mothers responding to their vocalizations than to their smiles as infants vocalize from birth, whereas smiling emerges at two months. Importantly, the data indicate that maternal responsiveness, whether as contingent responsiveness or mirroring, is distinct from maternal smiling or vocalizing per se.



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