

# Effect of Mother-Infant Skin-to-Skin Contact on Infants' Cortisol and Behavioral Response to the Still Face Task

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## ABSTRACT

The study investigated the effect of previous mother-infant skin-to-skin contact (SSC) on young infants' behavioral and physiological responses to the Still Face Task. Infants with and without early SSC engaged with their mothers in a Still Face Task at one month of age. Infants' response to the task was scored for attention (gaze to mother) and two measures of affect (smiles and non-distress vocalizations). Saliva samples were taken from the infants before and after the task, which were assessed for cortisol, a physiological indicator of stress. Only infants with SSC experience responded to the Still Face Task with reduced positive affect in the still face phase compared to the interactive phases and showed increased salivary cortisol during the task, suggesting that the infants' expectations for social interaction were violated in the task. SSC accelerated infants' knowledge about, and expectations for, their mothers' social behavior.



## BACKGROUND

This research investigated the effect of mother-infant skin-to-skin contact (SSC) on infants' developing social expectations by examining infants' behavioral and physiological responses to the Still Face Task at one month of age. Mother-infant SSC is a method of care for young infants in which the infant is placed between the mother's breasts dressed only in a diaper so that frontal body contact of mother and infant is skin-to-skin. Although SSC has been shown to benefit newborns' physiological adjustment, few studies have investigated the effect of SSC on young infants' social-cognitive development. The Still Face Task has been used extensively to assess infants' expectations for social interaction. Behaviorally, infants between 2 and 9 months typically show reduced positive affect, as well as reduced attention, to the still face phase compared to the interactive phases. Physiologically, infants 5 to 7 months of age show an increase in cortisol from before to after the task, indicating the task was a mild stressor. Tests of cortisol response to the task have not been conducted on younger infants. In the present study, infants with and without SSC and their mothers participated in a Still Face Task when the infants were one month of age. It was predicted that SSC would enhance infants' awareness of mother and advance their expectations for her behavior, resulting in earlier behavioral and/or physiological responses to the Still Face Task.

## METHOD

Mothers in the SSC group were requested to provide SSC for six hours/day for infants' first week of life, then two hours/day until infants were one month. No request for SSC was made to control group mothers. All mothers kept daily records of the SSC they provided.

**Table 1. Mean Hours per Day of Mother-Infant Skin-to-Skin Contact for the Skin-to-Skin and Control Groups during the Infants' First Week of Life and during Weeks 2 through 4.**

Group	Infant Age	
	Week 1	Weeks 2 through 4
Skin-to-Skin	4.91 (1.17)	2.87 (1.10)
Control	0.40 (0.77)	0.18 (0.36)

Note. Standard deviations are in parentheses.

The Still Face Task was conducted in the home when infants were one month old. In the task, mother and infant sat facing each other. In the initial phase (3 minutes), mother engaged the infant as she normally would. In the still face phase (1 minute), mother looked at the infant with a neutral expression with no touching or talking. In the reunion phase (2 minutes), mother engaged the infant again. Infants' response to the Still Face Task was scored for attention (gaze to mother) and two measures of affect (smiles and non-distress vocalizations). Saliva samples were taken from the infants before and 20 minutes after the Still Face Task. These samples were assayed for cortisol, a physiological indicator of stress.

Behavioral and cortisol data were analyzed from infants (SSC  $n=20$ , Control  $n=33$ ) for whom cortisol assays on both pre- and post-Still Face Task samples were viable. Data analyses were conducted on square-root transformations of the data because of skewness of the distributions. Figures depict the non-transformed data.

## RESULTS

### Behavioral Responses to the Still Face Task

The infants in the SSC and Control groups differed behaviorally in their response to the Still Face Task. SSC group infants showed the still face effect with vocalizations, whereas Control group infants did not. Both groups showed the still face effect with attention. Smiling showed a linear decline over the phases for both groups.

Figure 1

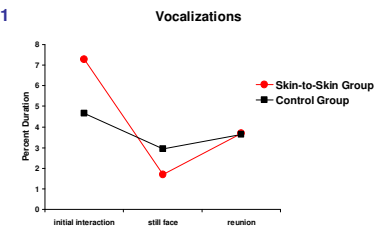


Figure 2

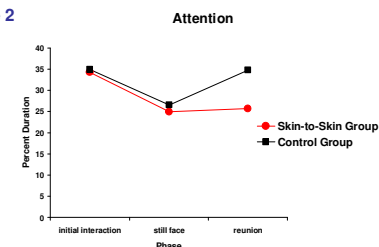


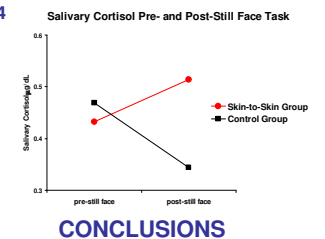
Figure 3



### Physiological Response to the Still Face Task

The difference in the SSC and Control groups was also reflected in the infants' physiological responses. Infants in the SSC group showed an increase in salivary cortisol from before to after the Still Face Task, whereas infants in the Control group showed a decrease, indicating that only the SSC group infants experienced the task as a mild stressor.

Figure 4



## CONCLUSIONS

Although both groups of infants detected changes in their mothers' interactive behavior, as indicated by their visual attention, only infants with SSC experience responded with reduced positive affect in the still face phase compared to the interactive phases and showed increased physiological stress during the Still Face Task. Thus, only the infants with SSC experience were responding to violations of their expectations for affect sharing. The results suggest that SSC enhances infants' sensitivity to mother and accelerates knowledge about, and expectations for, her behavior.



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