

## VII. Loss of control and negative behaviors in two-month-old infants in social and non-social situations

### Introduction

Loss of control over events is a frustrating experience for very young infants. Although the ability of young infants to learn contingencies is well established, only general negative emotions like fussing and crying have been reported in response to loss of control. Lewis, Alessandri and Sullivan (1990) report the presence of anger and intensified actions in infants as young as 8 weeks in response to violation of a learned expectancy (when the infants lose control over the expected outcome in a learning/extinction procedure).

*The Still Face* situation, in which mothers freeze their face and stop talking to their infants has a stressful effect on young infants. Toda and Fogel (1993) have found systematic changes in infant gaze direction, facial expressions and manual action in response to maternal still face in 3-month-old children. They suggest that disturbed 'emotional' responses in young infants involve the whole body and the patterns of action in a context.

Greater activity, more distress brow, and negative expressions during the still face sequence (Field, Vega-Lahr, Scadifi & Goldstein, 1986) suggest that the violation of expectancy and mother's emotional unavailability are more distressing for young infants than being left alone.

### Main question

Does violation of a learned expectancy in two different conditions, namely: *the extinction phase in non-social contingency* and *the Still Face situation* elicit different expressive and motor behaviors in 2-months-old infants? In other words, does a brief period of non-reward following consistent reward elicit different negative reactions when the stimulus is the mother versus a toy?

### Method

#### *Subjects*

Sixteen 2-month-olds (5 males and 11 females) and their mothers participated in the study. All infants in the study were first-born and full term at birth: none had a history of birth complications or neurological deficits.

#### *Apparatus and procedure*

Infants and their mothers were observed in a specially equipped room in Fiesole hospital, near Florence, Italy. All infants were randomly tested in two different conditions.

In the *Still Face situation* they were sitting on an infant seat at a height that allowed face-to-face interaction with the mother while she was seated. Three consecutive mother-infant face-to-face

episodes were observed in the same order for all subjects: normal face, still face, resuming normal face by mother. Each episode lasted one minute.

In the *contingency learning situation* infants were sitting in the same infant seat with a string connected to a Velcro wrist-cuff (Alessandri, Sullivan & Lewis, 1990). A pulling movement of the string in any direction triggered a 1.5 seconds activity of a toy (teeter-totter) provided with a carillon sound. Sufficient slack permitted hand-to-mouth movement before drawing the string taut. The experimental procedure was divided in 'baseline', 'acquisition' and 'extinction', lasting respectively 1 minute, 3 minutes and 2 minutes.

During 'baseline', operant levels of responding were established, during 'acquisition' subjects received a period of contingent stimulation in which the audio-visual stimulus occurred after an arm-pull; during 'extinction' infants had a two minutes period of non-reinforcement.

The frequency of arm-pull responses per minute served as a measure of learning. Learning was defined as two times the base-rate of arm-pulling: the mean per-minute arm-pulling rate after three minutes of stimulation had to be two or more times the mean base rate. Only the subjects who reached this criterion were included in the study.

### *Coding*

The expressive and motor behavior categories coded were mutually exclusive and exhaustive (*gaze, facial expressions, vocalizations, hands and body movements*). Coders were unaware of the hypothesis. Categories were coded, from videotape, in terms of *frequencies* (number of initiatives) and *durations*. Behav-

iors were coded second by second, for 1 minute of still face (second episode) and the first minute of the extinction phase of the contingency condition.

### **Results**

The number of initiatives (frequencies) and the duration of *Smiling* were significantly higher during the still face than during the extinction condition (number of initiatives:  $t(15)=-2.37, p<.03$ ; for durations:  $t(15)=-2.54, p<.02$ ) (see Figure 1).

The duration of *Short Vocalizations* was longer in the social situation; mean of 7.4 sec. for vocalizing during the Still face, and 3.6 sec. during extinction in the contingency learning situation ( $t(15)=-2.57, p<.02$ ) (see Figure 1).

The number of initiatives for *Distress Brow* was significantly higher in the extinction phase of the contingency learning situation than in the Still face condition ( $t(15)=2.36, p<.03$ ). The same was true for the number of initiatives of *Whimpering* ( $t(15)=2.60, p<.02$ ).

### **Discussion**

Our results support the hypothesis of differentiated behavioral patterns exhibited by infants at two months in a social and a non-social condition. It is known from the literature that from the spontaneous communication episode to the Still Face episode, infants systematically change their behaviors, decreasing smiling and increasing neutral expressions (Toda & Fogel, 1993). Our data show that, notwithstanding the expected decrease in

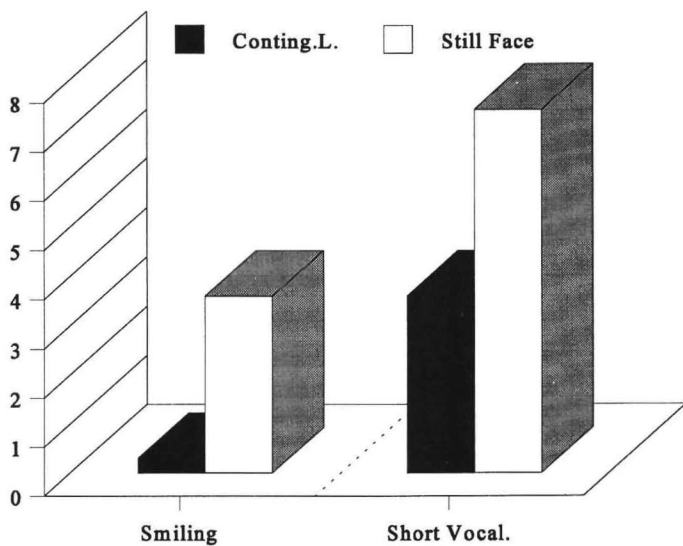


Fig.1. Mean of seconds for single behaviors in the two conditions: Still Face and Contingency Learning Extinction phase.

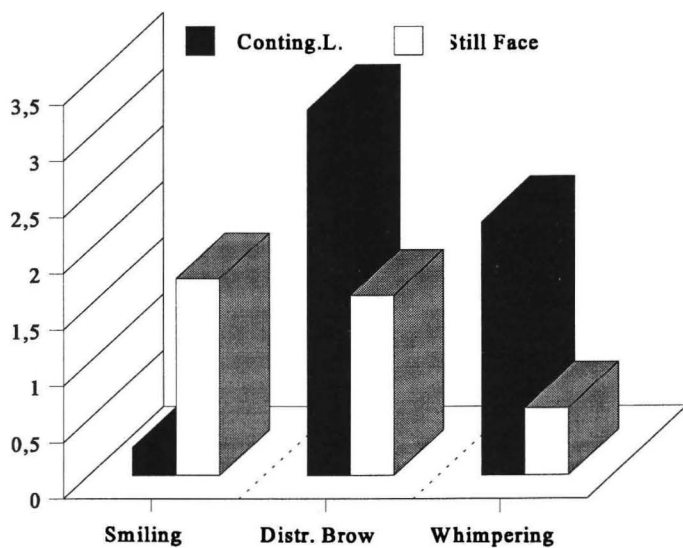


Fig. 2. Mean of initiatives for behaviors in Still Face condition and in Contingency Learning Extinction phase.

social behaviors directed to mothers, at least smiling and short vocalizations are significantly more present in the violation of expectancy concerning a social event, than in the violation of expectancy concerning a non-social one. It would be worthwhile to investigate how these differentiated patterns develop in the first semester of life, in view of the remarkable changes in infant's behavior around three/four months.

### References

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