ELSEVIER

International Journal of Psychophysiology 41 (2001) 155–168

INTERNATIONAL JOURNAL OF PSYCHOPHYSIOLOGY

www.elsevier.nl/locate/ijpsycho

The specificity of infant emotional expression for emotion perception

Gottfried Spangler[a,*], Susanne Emlinger[b], Joerg Meinhardt[b], Alfons Hamm[c]

[a] *Department of Psychology, University of Giessen, Otto-Behaghel-Strasse 10/F, Giessen D-35394, Germany*
[b] *Institute of Psychology, University of Regensburg, Regensburg, Germany*
[c] *Institute of Psychology, University of Greifswald, Greifswald, Germany*

Received 9 February 2000; received in revised form 3 December 2000; accepted 21 December 2000

Abstract

Attachment theory emphasizes the role of negative emotional expression in infancy for establishing proximity to and care of the caregiver. According to Lang's biphasic model of emotions protective reflexes (e.g. startle response) are primed if a defensive motivational set is activated. The aim of the study was to examine whether the perception of an infant emotional expression can prime such defensive behavior. The sample consisted of 48 university students. Startle reflex, corrugator and zygomatic EMG activity and subjective ratings of valence and arousal were assessed as a response to presentation of pictures of different emotional valence. Affective startle modulation was obtained when probes were presented during pictures of the International Affective Pictures System replicating previous findings. By contrast, negative infant emotion pictures did not prompt an augmentation of the startle response, although both the subjective ratings and the mimic EMG activity indicated a clear differentiation between negative and positive infant pictures. This pattern of findings was found only in a between-subject design, but not when the two picture sets were presented in the same session, indicating an interference of contrasting content of pictures.

Keywords: Perception of infant emotion; IAPS; Startle response; Mimic responses

* Corresponding author. Tel.: +49-641-99-26060; fax: +49-641-99-26079.
E-mail address: gottfried.spangler@psychol.uni-giessen.de (G. Spangler).

0167-8760/01/$ - see front matter
PII: S0167-8760(01)00127-1

1. Introduction

Infant emotional expression plays an important role for development, because during the first year before the onset of speech and even more during the first months before the up-coming of the first gestures, emotional expression and most of all negative emotional expression is the only way for an infant to communicate his/her needs to the caregiver. Thus, infant emotional expression is a substantial component of the infant-caregiver interaction. In the same way, substantial are the caregiver's responses to infant emotional expression, in particular the ability of the caregiver to perceive these emotional signals and to adequately interpret them, which should enable him/her for an appropriate caregiver behavior. According to attachment theory (Bowlby, 1969; Ainsworth et al., 1978) negative emotional expression or crying in infants is part of the infant attachment behavior system, which would be activated when the infant is distressed or anxious. The function of attachment behaviors is the activation of the complementary caregiving system of the mother or father in order to gain their support and comfort for emotional regulation (e.g. Spangler et al., 1994).

There is plenty of empirical evidence regarding the function and organization of the infant attachment system (e.g. Ainsworth and Wittig, 1969; Main and Solomon, 1990; Spangler and Grossmann, 1993). Moreover, there is strong empirical support for the important role of the caregiver's behavior on the quality of infant-caregiver attachment in terms of maternal sensitivity (Ainsworth et al., 1978; Grossmann et al., 1985; Spangler et al., 1996). Regarding the internal regulation of the caregiving behavior, attachment research focused on the role of attachment representation (Main et al., 1985; van Ijzendoorn, 1995). In contrast, little is known about basic motivational processes regulating the caregiver's responses to infant attachment behavior.

According to the biphasic emotion theory of Lang (Lang, 1995; Lang et al., 1990) emotions are defined as action dispositions, and emotional responses are assumed to be organized on the basis of two opponent motive systems, an appetitive and an aversive system grounded on neurophysiological circuits. According to this approach, the valence of a certain stimulus or a given context defines the general direction of behavior. While unpleasant stimuli activate the aversive motivational system priming defensive behavior to the level of protective reflexes, pleasant stimuli are expected to activate the appetitive behavioral set priming approach behavior. A crucial component of Lang's biphasic theory is the modulatory function meaning that new affective responses are modulated by the ongoing affective valence of behavior or state and that this modulatory effect can be observed on different levels of organization [level of expressive and evaluative language, behavioral level and physiological level (Lang, 1995)]. From this perspective, affective responses are most prominent if there is a match between the emotional foreground and the valence of the new stimulus. Thus, protective reflexes are enhanced if the organism is in an aversive motivational state and are inhibited if the actual valence of the context is positive. Similarly, positive stimuli would activate the appetitive behavioral system stronger given a positive valence of the ongoing context.

Empirical support for Lang's biphasic theory comes from a series of studies adopting the startle paradigm, in which the eye-blink response to a probe stimulus (e.g. a sudden loud noise) is investigated, while different affective states are evoked. From their theoretical point of view Lang and coworkers expected that the magnitude of the startle response would be bigger if the startle occurred in a negative context (i.e. if there is a match between stimulus and context), as compared to a positive context (mismatch). In their experiments they presented acoustic or visual startle probes to the subjects during ongoing presentation of picture slides with different emotional valence. In accordance to the theoretical expectations the magnitude of the eye-blink response to the startle probe was larger during presentation of unpleasant slides than during neutral and pleasant slides, the latter leading to the smallest responses (Vrana et al., 1988; Bradley et al., 1988). These findings have been replicated in various laboratories (Cook et al., 1992; Hamm