

INFANTS' PERCEPTION OF FACE-AFFECT RELATIONS IN MULTIMODAL EVENTS

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Introduction

The perception of faces and affective information emerge early in infancy. Newborns discriminate between the face of their mother and a stranger (Bushnell, 2001; Sai, 2005), and 2-month-olds discriminate among the faces of unfamiliar women (Bahrlick, Lickliter, Vaillant, Shuman, & Castellanos, 2004). By the age of five-months, infants discriminate among emotional expressions and match audible and visible affective expressions (see Walker-Andrews, 1997 for review). When do infants detect the relation between an emotional expression and the face of the person conveying the expression (e.g. Mary is happy but Sally is angry)? This relationship is arbitrary and may change over time and across contexts. Little research has investigated infants' detection of arbitrary multimodal relations. Research suggests that detection of arbitrary relations involving faces is evident between the ages of 3- and 6-months (Bahrlick, Hernandez-Reif, & Flom, 2005; Brookes, Slater, Quinn, Lewkowicz, Hayes, & Brown, 2001). Thus, the current study investigated five-month-old infants' perception and memory for the arbitrary relation between the face of a person and the affective expression that they conveyed. This information is important for social interaction, understanding communicative intent and understanding the affective state of individuals in differing contexts.

Method

Habituation Phase: Discrimination Test:

Twelve infants (final N to be 24) were habituated (in an infant controlled procedure) to alternating videos of two women speaking, one with a happy emotional expression and the other with an angry expression (see Figure 1 for an example of one condition). Following habituation, two test trials depicted a switch in the pairing of the face-affect relationship. The same two women were shown speaking but the one who was angry was now happy and the one who was happy was now angry (see Figure 2). Visual recovery to the switch in face-affect pairing was measured. It was expected that infants would show significant visual recovery to the switch in the

face-affect pairing if they could detect a relationship between the face of the individual speaking and the affective expression they conveyed.

Intermodal Matching: Memory Test:

In order to measure memory for the face-affect relationship, infants then participated in an intermodal matching procedure 2-minutes after the habituation phase. Two still images of the familiarized faces were presented side-by-side with neutral expressions (see Figure 3). A vocal emotional expression (either happy or angry) was played in the voice of an unfamiliar woman speaking the same phrase as before through a centrally located speaker. Two blocks of 4 15-second trials were presented with lateral positioning counterbalanced across trials. The proportion of total looking time (PTLT) was measured to the still, neutral face that was previously paired with the vocal emotional expression heard. It was predicted that infants would show a significant PTLT to the face that was previously paired with the vocal emotional expression if they remembered the face-affect pairing.

Figure 1: Habituation Phase



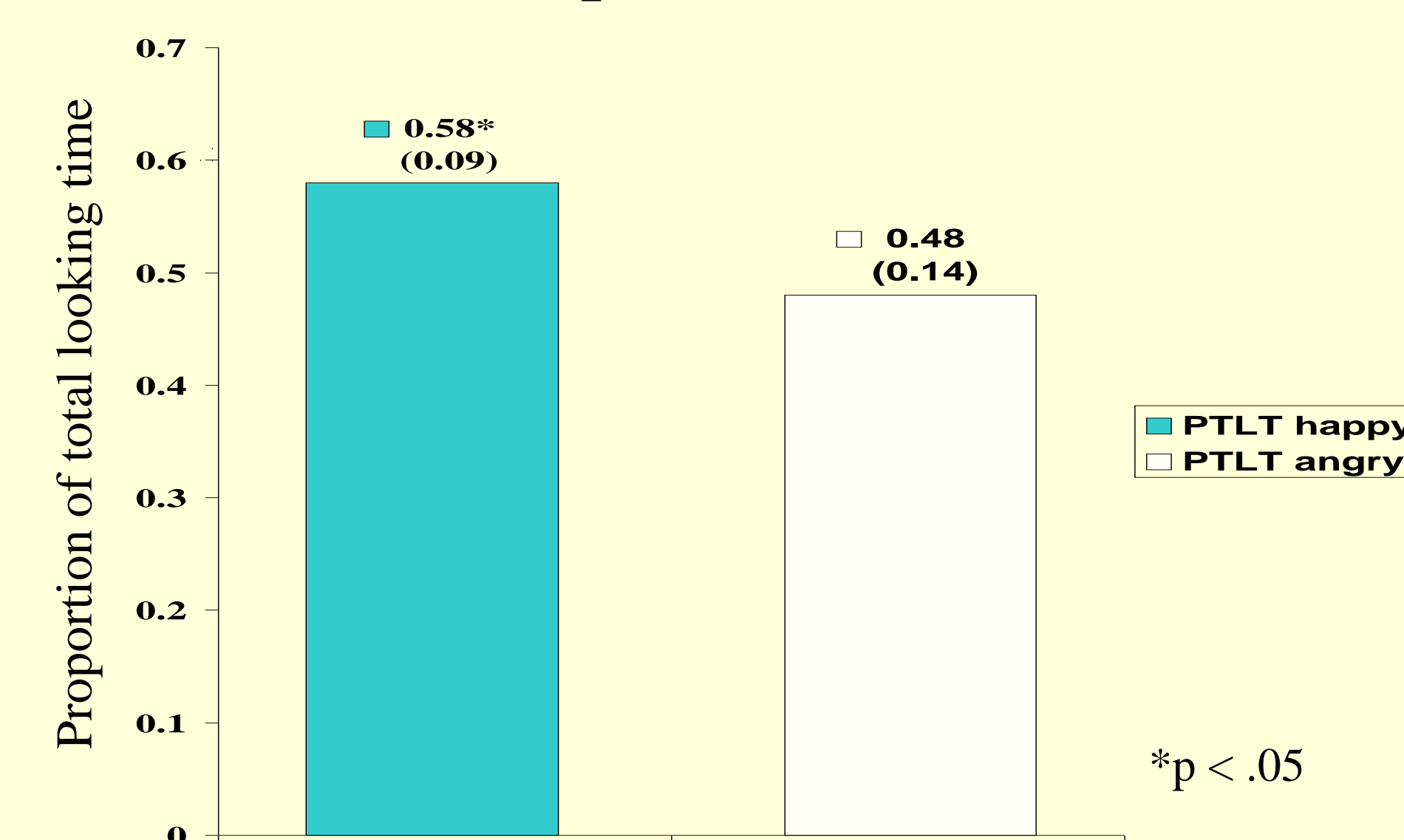
Figure 2: Discrimination Test



Figure 3: Intermodal Matching: Memory Test



Figure 4: Mean proportion of total looking time (and standard deviation) to the face that was previously paired with the vocal emotional expression heard.



Results

Habituation Phase: Discrimination Test:

Preliminary results (N=12) indicate no evidence of a significant visual recovery to the switch in face-affect pairing thus far ($M = 3.05$, $SD = 7.17$, $t(11) = 1.47$; $p > .05$).

Intermodal Matching: Memory Test:

In the intermodal matching procedure, however, infants showed a significant PTLT to the silent neutral face that was previously paired with the happy expression ($M = .58$, $SD = .09$; $t(11) = 2.99$; $p = .01$) but not to the face that was previously paired with the angry expression ($M = .48$, $SD = .14$; $t(11) = -.40$; $p > .05$; see Figure 4). Additionally, a trend in the results suggests that infants tend to look more at the neutral face that was previously paired with the happy expression across all trials ($M = .55$, $SD = .09$; $t(11) = 1.86$, $p = .09$).

Conclusions

These findings suggest that 5 1/2-month-old infants detect the arbitrary relationship between an unfamiliar person's face and the emotional expression they convey and use this information later to preferentially explore the person previously associated with the happy expression. Despite the lack of significant findings in the habituation procedure, infants significantly matched the neutral face of the person who had previously displayed a happy expression with the happy vocal expression previously heard. Since the faces in the intermodal matching procedure display neutral expressions, any matching must be based on information acquired during the habituation phase. These results suggest that 5 1/2-month-old infants detect and remember face-affect relations and use this information to guide their looking preferences across a 2-minute delay. This study contributes to the literature on infant perception of audiovisual emotional expressions and their detection of arbitrary intermodal relations in naturalistic contexts.

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