Interpretation and Impression of Ambiguous Eye Gaze of a Mother and Child in a Japanese Traditional Picture

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Abstract Using various compositions with alterations in figures’ gaze directions and additions of an object, the interpretation of gaze directions and the impression of a figure were examined. The results obtained by factor analysis, cluster analysis, multi-dimensional scaling and questionnaires showed that 1) observers’ impression of a figure was affected not only by figures’ gaze directions but also by the presence or absence of an object viewed by figures, 2) compositions of joint attention gave a positive impression even if in an averted composition (parallel joint attention), 3) the pictures used here were viewed from the point of view of the attachment of mothers and the independence of children, and 4) a woman in this picture was evaluated from the aspect of a motherhood or pre-motherhood impression. These results are discussed in terms of the cognitive process of gaze directions as well as the developmental process of the mother–child relationship. J Physiol Anthropol Appl Human Sci 23(6): 299–301, 2004 http://www.jstage.jst.go.jp/browse/jpa

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Introduction

Unlike other mammals, human beings have a very particular eye shape, horizontally long and wide in white area (sclera of eyes). While other mammals’ eyes have evolved to hide the white area so that the attackers or predators cannot sense their gaze directions, human beings’ eyes have evolved so that the border between pupil and sclera is used as gaze information for social communication (Kobayashi, 1997). In fact, a lot of psychological studies show that human beings can detect gaze directions quickly and accurately (e.g. von Grünau and Anston, 1995; Friesen and Kingstone, 1998; Sato and Matsuzaki, 2000). Neurophysiological and neuroimaging studies have also shown the neural bases of gaze detection and its influence on emotion (see Allison, et al., 2000; Emery, 2000).

However, the rapid and accurate detection of gaze directions and/or the presence of the neural mechanisms do not guarantee a role in social cognition for the gaze directions. To use gazing information for social communication, we also need the ability to interpret its meaning in the socio-cultural context (e.g. Argyle, 1983; Kitayama, 1998).

In the present study, the interpretation and impression of gaze directions was examined using an Ukiyo-e picture, a Japanese traditional artwork in the 18th century. Figures in Ukiyo-e pictures often have ambiguous gaze directions because their eyes are drawn as thin lines. This ambiguity gives us multiple interpretations of gaze directions and multiple impressions of a figure. Thus, the impression of the figure would suggest, in turn, what cues observers have selected and integrated to determine the gaze direction. The impression of figures would also indicate the social meaning of gaze directions under the socio-cultural context.

Method

Stimuli: The Ukiyo-e print entitled A Mother and Child in the Garden Just Outside of the House produced by Harunobu Suzuki was used as a stimulus. It was scanned into a personal computer, letters and signet in it were erased, and was converted into monochrome. Then, the gaze directions of figures were modified by altering the figures’ face orientation or spatial positions. The original composition was also altered by adding an object viewed by the figures. A bird was chosen as an added object for two reasons. Firstly, it could be placed freely on any composition, and secondly, it has the taking-off characteristic. Kitayama (1998), a Japanese psychoanalyst, pointed out that in many Ukiyo-e pictures, a mother and a child (or children) often viewed fleeting or transient objects together. A bird is also an object that easily disappears from the view.

Thirteen pictures were prepared comprising of 12 compositions with and without a bird for 4 types of gaze relation between a woman and child (combination of facing to or facing away compositions by a mother or child), one variation of distance in facing composition (with and without a bird), and one composition of figures looking at each other.
without a bird (see Table 1 in Miura, 2003). All compositions were printed out on A4-sized papers.

**Procedure:** Forty observers (13 male and 27 female students) evaluated the impression of a woman in each picture by the semantic differential (SD) method composed of 10 pairs of adjectives on a 7-point scale. Observers also answered a questionnaire about the gaze relation and conversational relation of the figures. Each questionnaire was comprised of the six choices that were selected through a pre-study. In order to avoid social bias, the term “woman” rather than “mother” was used in the instructions.

**Results**

**Factor analysis of the adjective pairs and cluster analysis of the stimuli**

Factor analysis of the adjectives showed two aspects of a woman, “motherhood” and “pre-motherhood.” The usage of “pre-motherhood” has two connotations, “not mature enough to be a mother” female and “womanhood” as the slogan, “we are women before mothers”.

The cluster analysis of the stimuli also showed two kinds of composition with similar impressions, the compositions of a woman facing a child and a woman averting (facing away) from a child. According to the SD profiles, the composition facing a child gave the motherhood impression and the composition averting from a child gave the pre-motherhood impression.

An exception was seen in one result, in which the woman averting from the child but still evoked the motherhood impression (stimulus 13 in Fig. 1). According to the questionnaire results, observers inferred that the figures in this composition looked at the same object, a bird and listened to each other’s talk. On the other hand, the similar composition without a bird (stimulus 12) gave the pre-motherhood impression. According to answers to the questionnaire, observers judged the figures to be looking in different directions and ignoring each other’s talk.

**Multi-dimensional scaling (MDS)**

Using the standard scores of the SD method, MDS was conducted. Results showed that the pictures were located on a two-dimensional similarity space. That is, the observers viewed the pictures from two aspects, the attachment of a mother and the independence of a child. As shown in Fig. 1, the women facing to the child were located on the positive side of x-axis and the women averting from the child were located on the negative side of it. So, the x-axis was interpreted as the woman’s attitude to the child, namely, the mother’s attachment. On the other hand, with regards to the y-axis, the child looking up at the woman (stimulus 3) or the child who seems to pull the woman’s sleeve (stimulus 9) was located on the negative end and the child averting from the woman and looking at a flying bird (stimulus 11) was located on the positive end. So, the y-axis was interpreted as the child’s attitude to the woman, namely, the independence from the mother.

The composition of the above mentioned exception (stimulus 13) was located at the positive side of the x-axis and the extreme top of the y-axis, so this composition was considered to give the motherhood impression of a woman and the most independent impression of a child.

**Discussion**

Using an Ukiyo-e picture with ambiguous eye gaze directions, the interpretation and impression of gaze directions of the figures was examined. The presence of an object viewed by figures changes the interpretation of a situation and the
impression of a figure. That is, gaze directions are determined by not only direct cues of gaze but also by contextual cues like objects. In another experiment (see Fig. 3 in Miura, 2003), the fixation points of eye movements looking at these pictures during one second showed that the observers seldom looked at an object located in the peripheral area but their judgments of a figure are often affected by it. Even a small object in the periphery, that may fail to be noticed, has the possibility to affect the interpretation of a situation and the figure's impression.

The results in this experiment also reconfirmed that face-to-face compositions give a positive impression and the averting compositions give a negative impression to a figure. In the face-to-face composition, the positive impression of the woman increased when she was interpreted as looking at the same object as the child, that is, in the composition of “joint attention.” Even in an averting composition, when observers interpreted the figures attending to the same object, it gave a positive impression. Kitayama (1998) named this type averting composition “the parallel joint attention.” He pointed out that this composition indicates the transient period of the mother–child relationship from a closed dyadic relationship between a mother and a child to open triadic relations including others or objects. The present result obtained by “parallel joint attention” showed the most independent impression of the child, which supports Kitayama’s assumption.

Kitayama (1998), however, also pointed out that the compositions of “parallel joint attention” were rare in western artworks. Cross-cultural studies are needed to confirm that western observers have the same interpretation and impression on this composition as those of Japanese observers.

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References


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