



Short Communication

Strange-face illusions during inter-subjective gazing

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ABSTRACT

In normal observers, gazing at one's own face in the mirror for a few minutes, at a low illumination level, triggers the perception of strange faces, a new visual illusion that has been named 'strange-face in the mirror'. Individuals see huge distortions of their own faces, but they often see monstrous beings, archetypal faces, faces of relatives and deceased, and animals. In the experiment described here, strange-face illusions were perceived when two individuals, in a dimly lit room, gazed at each other in the face. Inter-subjective gazing compared to mirror-gazing produced a higher number of different strange-faces. Inter-subjective strange-face illusions were always dissociative of the subject's self and supported moderate feeling of their reality, indicating a temporary lost of self-agency. Unconscious synchronization of event-related responses to illusions was found between members in some pairs. Synchrony of illusions may indicate that unconscious response-coordination is caused by the illusion-conjunction of crossed dissociative strange-faces, which are perceived as projections into each other's visual face of reciprocal embodied representations within the pair. Inter-subjective strange-face illusions may be explained by the subject's embodied representations (somaesthetic, kinaesthetic and motor facial pattern) and the other's visual face binding. Unconscious facial mimicry may promote inter-subjective illusion-conjunction, then unconscious joint-action and response-coordination.

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1. Introduction

Gazing at one's own reflected face in a mirror, at a low illumination level, reportedly leads to experiences termed 'strange-face in the mirror' illusions (Caputo, 2010a). In a study set-up under controlled laboratory conditions, all of the 50 healthy young adults (mean age 23 years) began to perceive strange-face illusions after about 1 min. When a 10 min session of mirror gazing ended, participants experienced striking effects such as huge deformations of one's own face (reported by 66% of individuals); a relative's face with the changed features (18%), of whom 8% were still alive and 10% were deceased; an unknown person (28%); an archetypal face, such as a numinous child, a young androgyne, a very old woman, an ancestor or a shaman (28%); an animal face such as a cat or a pig (18%); and monstrous beings such as a witch or a skull (48%).

Previous clinical studies used mirrors in bereavement therapy. Research with the psychomanteum showed that individuals experienced hallucinations when a mirror was displayed in a darkened room, with black opaque curtain cloth on walls, and the mirror reflected the space above while the seated individuals did not see their reflected face or body (Terhune & Smith, 2006). Experiences with the psychomanteum are hallucinations of dialogue, sounds, light, bodily sensations and smell, in addition to visual imagery in the mirror. On the contrary, strange-faces during mirror gazing are likely to be classified as illusions because they have a distinctive visual character and are specific of the dysmorphic perceptions of one's own face. Another difference is that strange-faces are produced by a visual stimulus, whereas hallucinations can happen when physical stimulus is absent. For instance, hallucinations are regarded as false-positive responses in psychophysical tasks (Bentall, 1990).

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Strange-face illusions may be similar to some out-of-body experiences that have been studied experimentally in healthy individuals, who perceive an illusory own body in extracorporeal space (Lenggenhager, Tadi, Metzinger, & Blanke, 2007; Sforza & Blanke, 2012). However, experimental out-of-body experiences involve illusory self-identification with the double, whereas strange-face illusions are always dissociative of the self in healthy individuals (Caputo, 2010b). Instead, in schizophrenic patients, identification with strange-faces during mirror-gazing can be frequent, probably due to psychotic ego dysfunction and misattribution of agency (Caputo et al., 2012).

The purpose of the present study is to investigate whether strange-face illusions were perceived when two individuals, in a dimly lit room, gazed at each other in the face. In preliminary trials, I found that each participant of the experimental pair described spontaneously illusions of deformed faces and strange-faces of the other participant, even if they had not been told in the initial instructions that this may happen.

Strange-face illusions that the subject perceives in the mirror are seen into the other's metamorphosed face during inter-subjective gazing. This phenomenon would show that individuals share strange-face illusions within a pair, hence it would shed light on the process of 'projection' of unconscious mental contents between individuals, as found in dynamic psychology (Jung, 1977). Moreover, inter-subjectivity could emerge through synchronization of strange-face illusions between individuals. This finding would provide a basis for scientific investigations of meditation techniques known in alchemy and magic as two-vase opus (Ur group, 2001) that has parallel traditions in Buddhism and Taoism.

2. Methods

Ten adults participated in the experiment. They were naïve observers, unaware of the aim of the research; no psychiatric disorders; mean age 27.3 years, s.d. 8.6; two men and eight women. Two pairs were formed of a man and a woman; others pairs were formed by two women.

The experiment was conducted in a 4 m × 4 m white room, quiet and obscured from external light. Two chairs were positioned around the center of the room, facing each other. The two participants were seated so as to maintain a distance of 1.0 m between faces. The space left empty between the chairs was 0.4 m wide and it was covered with a flat opaque panel. A halogen lamp (Osram 12V, 10W) produced a fixed beam illumination. The spotlight was mounted under the flat panel, at the very center, halfway between the two chairs. The spotlight beam pointed toward the floor in such a way to produce only indirect, diffuse and relatively uniform lighting within the room. Illumination of faces was approx. 0.2 cd m⁻², measured by a digital photometer with a wide-angle sensor (Pantec by Carlo Gavazzi, LM-20). This level of illumination allowed detailed perception of fine face traits but attenuated color perception.

Instructions for the experimental task were the following: "You should maintain a neutral facial expression. Your task is to look at the other participant; you should keep gazing into the eyes of the other participant. You may or may not perceive changes in the face of the other participant. Press the button once you perceive a change and keep it pressed for as long as you perceive the change. If you don't perceive any change, then don't press the button". The session began with a few minutes of light adaptation; then a 10-min inter-subjective gazing.

Dependent variables of the experiment were the following: the event-related-responses, three Likert-type scales and the phenomenological description. Event-related-responses were recorded through two response switches and digitally stored. Each member of a pair had a response switch in one hand, covered by the other hand, with hands on legs, in order to completely hide finger movement. The frequency of event-related responses was defined by the number of times observers pressed the response button, averaged per minute. The mean duration was the mean time they held down the response button.

Time-series analysis was run on durations of illusions in each participant. Autocorrelation functions were calculated between the values of the series of durations of illusions with the values lagged from 1 to 7: the illusion prior to the current illusion is a lag of 1, two illusions prior to the current illusion is a lag of 2, etc. In the autocorrelation function, the difference-transformation parameter was set to 1; this value removes linear trend. Statistical test of periodicity, within the series of durations, used the null hypothesis that variations of durations were produced by white noise intrinsic to the process. Statistical significance was calculated through standard errors.

Inter-subjective synchronization between event-related responses of the members of each pair was measured. Synchronization of event-related responses was defined as follows: if, during a response by one member, the other member also starts to respond, the responses by the pair were classified as synchronous. In other words, at a certain time both members were pressing their respective buttons together, unaware of the other's action. Moreover, the time-lag between the onsets of two synchronous responses was measured. The percentage of synchronous responses of each participant was calculated over the total number of his responses.

Self-evaluation was made on three Likert-type scales. Sentences of Likert-type scales were the following: 'How often did you notice anything strange?', 'How often did it seem real?', 'How often did you see another person?'. Responses given were scored on a five-point Likert-type scale, ranging from 'never' (= 0), 'rarely' (= 1), to 'very often' (= 4).

Participants were asked to give a description of their phenomenological experience ('What did you see?'). The descriptions were classified according to categories found in previous studies (Caputo, 2010a). For each participant, the total number of different strange-faces was counted.

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