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Are non-verbal facial cues of altruism cross-culturally readable?

Arnaud Tognetti^{a,b,*}, Noriko Yamagata-Nakashima^c, Charlotte Faurie^b, Ryo Oda^d^a Institute for Advanced Study in Toulouse, France^b Institute of Evolutionary Sciences (ISEM), University of Montpellier, CNRS, IRD, EPHE, Montpellier, France^c Department of Computer Science, Nagoya Institute of Technology, Japan^d Graduate School of Engineering, Nagoya Institute of Technology, Japan

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ABSTRACT

Although both dynamic (i.e., facial expressions) and static facial traits are used as cues of altruism, only static facial traits have been shown to be cross-culturally readable with respect to altruism detection skills. To investigate whether dynamic facial cues of altruism are also cross-cultural, we asked French subjects to estimate the altruism of Japanese individuals on the basis of silent video clips. These video clips were taken from a previous experiment, which found that Japanese raters were able to accurately estimate the altruism of a videotaped Japanese individual. By using the same design and stimuli in France, we found that French raters were unable to assess the altruism of a Japanese individual. Hence, our results suggest that dynamic facial cues of altruistic intent are culturally specific rather than universally readable.

1. Introduction

Humans are thought to have evolved unique cognitive mechanisms to maintain large-scale cooperation between unrelated individuals (Melis & Semmann, 2010). One of these mechanisms is the “Darwinian algorithm” for cheater detection (Cosmides, 1989), which refers to the capacity to discriminate between cheaters and cooperators. This mechanism is argued to be one of the most ancient of the evolved mechanisms for interpersonal decision-making (Cosmides & Tooby, 1992; Todorov, 2008). The capacity to distinguish altruists from egoists by potential partners enables an individual to assort with other individuals according to their propensity to cooperate (D. S. Wilson & Dugatkin, 1997). This assortment has been suggested to lead to the evolution of cooperation if the advantages of selfish individuals are outweighed by the benefits of mutual cooperation between altruists.

Discriminating between high and low altruistic individuals and estimating trustworthiness and cooperativeness is a fast, spontaneous and intuitive process (Bonnenon, Hopfensitz, & De Neys, 2013, 2017; Dzhelyova, Perrett, & Jentsch, 2012; Todorov, 2008) that could be based on both static and dynamic facial traits (e.g., Bonnenon et al., 2017; Fetchenhauer, Groothuis, & Pradel, 2010; Oda, Yamagata, Yabiku, & Matsumoto-Oda, 2009; Tognetti, Berticat, Raymond, & Faurie, 2013). For example, in trust games, decisions regarding whom to trust are biased by static traits, such as attractiveness (R. K. Wilson & Eckel, 2006), similarity to kin (DeBruine, 2002) and the facial width-to-height ratio (Stirrat & Perrett, 2010, 2012). Dynamic facial cues, such

as expressions and movements, have also been implicated in the detection of altruism. Using silent video clips of individuals' faces while they were talking about themselves, several studies found that people can predict the altruistic intent of a target individual (Brown, Palameta, & Moore, 2003; Fetchenhauer et al., 2010; Oda, Yamagata et al., 2009). While static facial cues of altruism have been shown to be inter-culturally readable (Tognetti et al., 2013), dynamic facial cues of altruism have only been studied intra-culturally. Therefore, investigate whether the detection of altruism based on facial expressions was cross-culturally possible, or not, was thus a crucial next step. To fill this gap, we conducted a study in which we asked French subjects to estimate the altruism of Japanese individuals on the basis of silent video clips during which the Japanese individuals spoke about themselves.

Facial emotional expressivity, particularly related to positive emotions, has been shown to be among the non-verbal traits that serve as cues of altruistic intent in several populations (Brown et al., 2003; Mehu, Grammer, & Dunbar, 2007; Mehu, Little, & Dunbar, 2007; Schug, Matsumoto, Horita, Yamagishi, & Bonnet, 2010). Genuine (Duchenne) smile, characterized by the activity of the *orbicularis oculi* (surrounding the eyes) in combination with the *zygomatic major* (raising the corners of the mouth) muscles, seems particularly important in the detection of altruism. This smile is associated with genuine feelings of positive emotion and is difficult to produce deliberately (Ekman, Davidson, & Friesen, 1990; Ekman, Friesen, & O'sullivan, 1988), thereby ensuring its honesty.

In addition, several studies have shown the following: (i) highly

* Corresponding author at: Institute for Advanced Study in Toulouse, France.

E-mail address: arnaud.tognetti@gmail.com (A. Tognetti).

altruistic individuals exhibit more genuine smiles than less altruistic individuals (Brown et al., 2003; Centorrino, Djemai, Hopfensitz, Milinski, & Seabright, 2015; Oda et al., 2009); and (ii) genuine smiles play a role in the assessment of trustworthiness and altruism (Centorrino et al., 2015; Oda, Yamagata et al., 2009; Reed, Zeglen, & Schmidt, 2012) and (iii) influence individuals' decisions regarding with whom to cooperate (Centorrino et al., 2015; Johnston, Miles, & Macrae, 2010; Oda, Naganawa, Yamauchi, Yamagata, & Matsumoto-Oda, 2009; Reed et al., 2012). For example, Oda, Yamagata et al. (2009) used the self-report altruism scale (Johnson et al., 1989) to measure the altruism of Japanese students, and they recorded the highest and lowest altruistic individuals with a video camera during a self-presentation. By showing 30-second silent video clips of these self-presentations, they found that Japanese raters accurately estimated the altruism of the videotaped Japanese (Oda, Yamagata et al., 2009), and that highly altruistic individuals were more trusted than less altruistic individuals in a faith game (Oda, Naganawa et al., 2009). They also coded these videos to examine which traits the raters used to assess the target's altruism. The results showed that altruists and non-altruists differed in their number of genuine smiles exhibited in the videos, but not for the other cues recorded such as head nods, time per smile, and smile symmetry (Oda, Yamagata et al., 2009). Hence, genuine smile seems to be the main dynamic trait advertising altruism in the Japanese culture.

Using a trust game, a study conducted in France found similar results (Centorrino et al., 2015); the French participants were able to predict their partner's trustworthiness based on the presence of genuine smiles that were exhibited during the silent video clips. Genuine smiles influenced the participant's willingness to send money to the partner. In addition, those partners who were rated as smiling more genuinely returned more money on average to the senders, inducing a higher payoff for both partners.

Overall, these studies conducted in several populations strongly suggest that humans have cognitive architecture for assessing altruism and that dynamic facial traits are common cues of social behaviors that might be shared across cultures. Therefore, in our study we predicted that French raters would be able to correctly assess Japanese' altruism based on dynamic facial traits, such as genuine smiles.

However, although facial expressions have long been considered as universal signals, recent studies challenged this conjecture by showing that internal representations of emotions differed between Easterners and Westerners (Jack, Caldara, & Schyns, 2012; Jack, Garrod, Yu, Caldara, & Schyns, 2012, 2011). For example, Easterners show a preference for expressive information in the eye region, whereas westerners predominantly feature the mouth (Jack, Caldara, et al., 2012). This cultural difference in facial expressions is likely to affect the perception of some personality traits, such as trustworthiness and altruism. Indeed, it has been found that Japanese participants perceived faces with greater upper-half (around the eyes) smile intensity as more trustworthy, whereas American participants perceived faces with greater lower-half smile intensity as more trustworthy but they were not influenced by the upper-half smile intensity (Ozono et al., 2010). Although genuine smile influence perceived trustworthiness in both cultures, these results suggest that the way smiles are dynamically and physically expressed in the face and interpreted by others differs across cultures. Hence, we also predicted that the French raters would be less accurate than the Japanese raters in their assessments of Japanese' altruism.

To sum up, the aim of the current study was to question the cross-cultural validity regarding altruism detection skills based on dynamic facial cues. To this aim, we asked French subjects to estimate the altruism of Japanese individuals on the basis of silent video clips during which the Japanese individuals spoke about themselves. These video clips were taken from a previous experiment (Oda, Yamagata et al., 2009), in which the authors found that altruists exhibited more genuine smiles than non-altruists, enabling Japanese raters to accurately estimate a target's altruism (see above). Because genuine smiles seem to be

used as cues of altruistic intent in different populations, such as in Japan (Oda, Yamagata et al., 2009; Oda, Naganawa, et al., 2009), France (Centorrino et al., 2015) or the USA (Reed et al., 2012), and thus could be a universal cue of altruistic intent, we predicted that French raters would estimate the altruism of Japanese individuals correctly. Nevertheless, because cultural difference is likely to affect facial expressions (Jack et al., 2012) and their perception (Ozono et al., 2010), we also predicted that the French raters would be less accurate than the Japanese raters in their assessments of altruism.

2. Methods

2.1. Videotaping of Japanese individuals

We used the same video clips of natural conversations that were used by Oda, Naganawa, et al. (2009) and Oda, Yamagata, et al. (2009) as stimuli. To select the most versus the least altruistic individuals for videotaping, we used the self-report altruism scale employed by Johnson et al. (1989). This scale was previously validated by showing significant differences in the number of lottery tickets shared in the dictator game between those who scored in the top 10th percentile and the bottom 10th percentile (Brown et al., 2003).

Male Japanese undergraduates ($n = 69$; mean age: 18.7 years \pm 0.9 s.d.) were asked to indicate how often they performed each altruistic act described in the 56 statements of the altruism scale from 1 (never) to 5 (very often). All the participants were volunteers from a class at the Nagoya Institute of Technology, Japan. The participants' scores were then transformed into percentiles. The 90th percentile and above on the scale represented the most altruistic individuals, while the 10th percentile and below represented the least altruistic individuals. Using these criteria, we chose the seven most and seven least altruistic individuals. These 14 people were called and asked to participate in the videotaping. Six among the most and four among the least altruistic individuals agreed to participate. They were brought to the laboratory one at a time. The experimenter, who was unaware of each person's category, sat just beside a video camera in front of the target person who was asked to make a self-presentation discussing his likes and dislikes. Close shots of the target (above the shoulder) in front of a white screen were videotaped. The videos were transformed into digital files and the first 30 s of each presentation was selected. Then, the video clips were edited into a sequence of the 10 targets' presentations. The sound was deleted to control for the verbal content.

2.2. The detection of altruism by French raters

To test whether French raters are able to estimate Japanese altruism, 151 French men and 252 French women (non-French were excluded for the analyses), ranging from 18 to 26 years old (mean age: 19.5 years \pm 1.4 s.d.) were recruited on a voluntary basis from 11 classes at the University of Montpellier, France. We obtained written informed consent from all of the participants.

The procedure followed that of Oda, Yamagata et al. (2009). First, the raters were asked to indicate how often they had performed each altruistic act described in the seven statements of the altruism scale (Table 1) that were previously found to have the greatest effect sizes for distinguishing the six most and the four least altruistic individuals (Oda, Yamagata et al., 2009). Then, the participants were told that they would be viewing a series of videotaped people making self-presentations. The video clips were always projected on screens of similar sizes that were located in the classrooms. We explained to the perceivers that these people, like themselves, had filled out the seven-item questionnaire. The perceivers were then asked to predict the altruism scores of each target for each of the seven items of the questionnaire. The series of video clips was then presented a second time. All the groups observed the same ten targets, but the order of the presentation was randomized for each group.

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