Short Report

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Trust in Me

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Trust in Me:

Trustworthy Others Are Seen as More Physically Similar to the Self

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The face is easily the most recognizable part of the body and the most important for social interaction (Farmer & Tsakiris, 2012). Facial appearance is often used as a guide to personality traits such as trustworthiness (Todorov, 2008). Recent studies have demonstrated that, in addition to objective characteristics such as the resemblance of the structure of a face to positive and negative emotional expressions, subjective characteristics such as the similarity of another person's face to one's own also influence people's judgments about a person's character (Bailenson, Iyengar, Yee, & Collins, 2008; DeBruine, 2002, 2005).

Coupled with research suggesting that people have overly positive self-views (Taylor & Brown, 1988), including viewing themselves as more trustworthy than the average person (Flynn & Lake, 2008), these findings suggest that people favor those who are physically similar to themselves. Indeed, facial similarity leads to increased attributions of trustworthiness (DeBruine, 2005) and increased cooperation in both trust games (DeBruine, 2002) and common-goods games (Krupp, Debruine, & Barclay, 2008).

Although the effects of facial similarity on cooperative interactions are well documented, little is known about whether the perceived similarity between the self and others can change as a result of such interactions. The experience of another's face being similar to one's own can be thought of as the felt output of a computational system that utilizes direct, phenotypic cues (e.g., objective facial features) and indirect, contextual cues (e.g., coresidence early in life; DeBruine et al., 2011; Penn & Frommen, 2010) to gauge genetic kinship (cf. Kurzban, Duckworth, Kable, & Myers, in press). If evidence of cooperative intent in others serves as a contextual cue to kinship, then people may perceive another who behaves in a trustworthy way toward them as more physically similar than another who behaves in an untrustworthy way.

The influence of trustworthiness on perceived facial similarity was investigated by Verosky and Todorov (2010), who found that untrustworthy-looking faces were viewed as less similar to the self than trustworthy-looking faces were. However, in their study, trustworthiness was manipulated by varying the physical characteristics of the face rather than by varying actual behavior. In the present study, we examined how participants' perception of facial similarity was affected by taking part in a social interaction (trust game) in which the trustee either rewarded or betrayed the participant's trust.

Method

Fifty-nine participants (mean age = 23.6 years, *SD* = 5.2; 44 female, 15 male) played two trust games in the role of trustor, each with a separate gender-matched trustee unknown to the participant. In each game, a photograph of the trustee was presented on the screen, and participants decided how much of a £2.50 endowment (in £0.50 increments) to transfer to the trustee. Participants knew that these transfers would be tripled by the experimenters. After making both transfer decisions, participants viewed prerecorded videos of the trustees stating how much money they had decided to return to the trustor. We used the *strategy method* (Brandts & Charness, 2011), whereby we informed participants that each trustee had previously made a series of hypothetical back-transfer decisions, one for each of the possible transfers trustors could make. In reality, trustee decisions were determined by the experimenters, such that trust was always reciprocated in one game (70% of tripled transfer returned) and betrayed in the other (10% returned).

Immediately prior and subsequent to these games, participants performed a self-recognition task (Tajadura-Jiménez, Grehl, & Tsakiris, 2012) so we could measure participants' point of subjective equality (PSE) with each face. In this task, we showed participants a series of

morphed images of their own face and one of the trustees using a staircase procedure. The PSE represented the degree of morphing at which the participant perceived the percentage of self and other in the photo to be the same (full details of this task and additional ratings of trustees' faces are provided in the Supplemental Material available online). The order of trust conditions and the identities of the models used as the trustworthy and untrustworthy trustees were fully counterbalanced across participants. Following the self-recognition task, participants completed the Inclusion of Other in the Self (IOS) scale (Aron, Aron, & Smollan, 1992) for each trustee and were subsequently debriefed and dismissed with their earnings.

Results

A repeated measures analysis of covariance (as per Huck & McLean, 1975, and Tabachnick & Fidell, 1996), with postgame PSE as dependent variable, pregame PSE as covariate, and trustee trustworthiness as independent variable, revealed a significant difference between trust conditions, $F(2, 57) = 6.31$, $p < .05$, $\eta_p^2 = .17$. Adjusted postgame PSE was higher in the trustworthy condition ($M = 48.88$) than in the untrustworthy condition ($M = 45.99$; see Fig. 1). Participants also rated their relationship with the trustee as closer in the trustworthy condition (mean IOS rating = 3.34) than in the untrustworthy condition (mean IOS rating = 2.07), $t(58) = 6.8$, $p < .001$, $\eta_p^2 = .44$.

[TS: Insert Figure 1 about here.]

Discussion

In choosing partners for cooperative exchange, people rely on a range of facial characteristics to gauge the trustworthiness of others (Todorov, 2008). Recent studies indicate that greater similarity between one's face and that of another person enhances perceptions of that person's trustworthiness, as manifested in trust ratings (DeBruine, 2005) and behavior in economic games

(DeBruine, 2002; Krupp et al., 2008). In the study reported here, we showed that the reverse is also true: The faces of trustworthy interaction partners are perceived as more similar to one's own than those of untrustworthy interaction partners are.

The experience of facial similarity can be considered as the phenomenological component of a neurocomputational variable ("kinship index") that calibrates altruistic behaviors and regulates group cooperation (Krupp et al., 2008; Lieberman, Tooby, & Cosmides, 2007). According to this interpretation, our results suggest that evidence of cooperative intent in others not only helps to structure the phenomenology of facial perception, but also serves as a contextual cue to genetic relatedness.

Our findings corroborate the fluidity of perceived facial similarity. Interpersonal multisensory-stimulation experiments have demonstrated that synchronous visuotactile stimulation of one's own and another person's face causes participants to perceive the other person as both more physically and psychologically similar to themselves (Paladino, Mazzurega, Pavani, & Schubert, 2010; Tsakiris, 2008). Our study extends this finding by demonstrating that a purely social, as opposed to bodily, intervention can lead to analogous changes in perceived similarity.

Facial similarity has been shown to have an effect on judgments of trustworthiness and on cooperative behavior. By demonstrating that the converse relationship also holds, we suggest that the factors influencing perception of self-other similarity extend beyond objective physical characteristics and into the social realm.

Author Contributions

H. Farmer developed the study concept. All authors contributed to the study design. Testing and data collection were performed by H. Farmer. H. Farmer analyzed and interpreted the data under the supervision of R. McKay and M. Tsakiris. H. Farmer and R. McKay drafted the manuscript, and M. Tsakiris provided critical revisions. All authors approved the final version of the manuscript for submission.

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Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

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Supplemental Material

Additional supporting information may be found at http://pss.sagepub.com/content/by/supplemental-data

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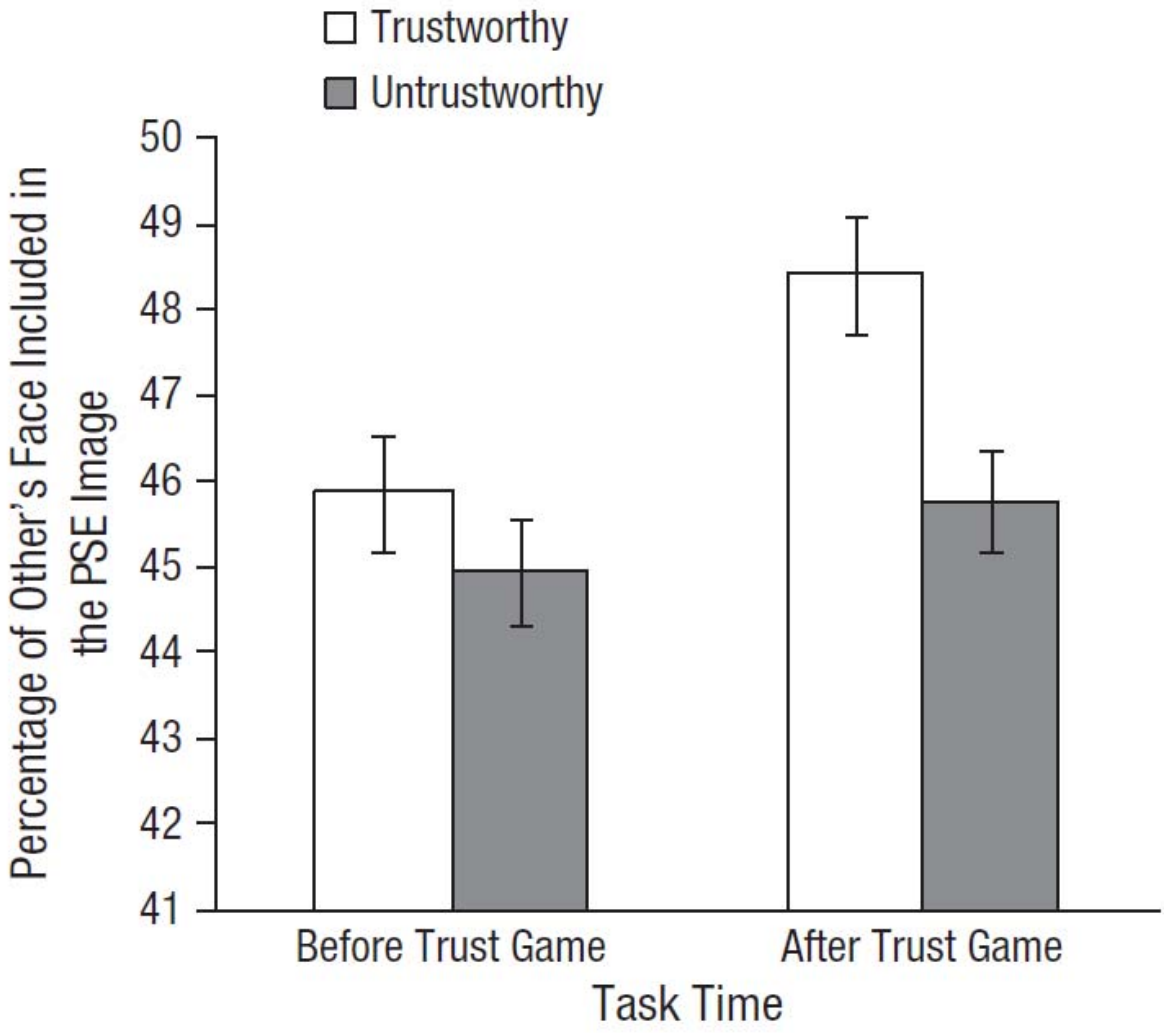
Fig. 1.

Mean percentage of the trustee's face present in the morphed image at the point of subjective equality (PSE) as a function of task time and the trustee's trustworthiness. The PSE was the degree of morphing at which participants perceived the percentage of self and other in the image to be the same. Higher values indicate greater perceived similarity between self and other. Error bars represent standard errors of the mean.



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Trust in me: Trustworthy others are seen as more physically similar to the self - Supplementary Online Materials

Further Details of the Self Recognition Task

Apparatus and materials.

Participants were required to come to an initial session approximately one week prior to the experimental session. During the initial session a digital photograph of the participant's face with a neutral facial expression was taken, and then converted to gray scale and mirror transposed (Keenan *et al.*, 1999). A black template was used to remove non-facial attributes (e.g., background, hair, ears). Subsequently, a computerized morphing procedure was implemented (Abrasoft Fantamorph) to produce a sequence of photos in which the participant's face was merged with another person's face in 1% morphing transitions. This sequence of photos had as end points the original photos of the participant's face and the other person's face. The 100 photos were saved as individual images.

Task Procedure

During the self-recognition task participants were presented with a series of images. For each image they indicated whether the depicted face "*looked more like their own face or more like the other person's face"* using a two-alternative forced choice (2AFC) method. Each image depicted a face with a varying degree of morphing between "self" and "other".

A standard staircase procedure (Meese, 1995) was used to find the degree of morphing for which participants perceived the percentage of "self" and "other" in the morph to be the same (hereafter referred to as point of subjective equality or PSE). Two staircases differing in direction (100% self to 100% other OR 100% other to 100% self) were randomly interleaved. We used a hybrid algorithm, in which two consecutive alike responses are required for a reversal when a change in response direction occurs (Meese, 1995). The initial step size was 5% and reduced to 1% after the first reversal. Each staircase ended after four reversals, and the task ended after both staircases were completed. This task, in which participants were required to give judgments for single pictures, without being aware of the direction of change from one picture to the other, avoids potential errors of habituation and/or anticipation due to cognitive expectations (Meese, 1995).

PSE was calculated to reflect the degree of morphing for which participants were equally likely to judge the morph as "self" or as "other". PSE values obtained for both interleaved staircases ("self to other" and "other to self" directions) were averaged for

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each experimental condition (Watson & Clifford, 2003; Webster *et al*., 2004) We present this value as the percentage of the "other" face contained in the PSE. For example, a PSE of 43% suggests that participants could not distinguish between self and other in the picture that contained 43% of the other-face and 57% of the self-face. Any increase in this value as a result of the social interaction would suggest an increase in the maximum percentage of the "other" face contained in the pictures judged as self.

Rating of Trustees' Faces

In the initial session participants rated the faces of the two trustees and 3 additional gender matched faces on attractiveness, trustworthiness and similarity to the participant's own face, using a 7 point Likert scale. The additional three faces were taken from the Karolinska database (Lundqvist, Flykt, and Öhman 1998; Oosterhof and Todorov 2008). Paired sample t-tests confirmed that there were no significant differences in ratings of attractiveness ($t(1,58) = .98$, $p = .33$), trustworthiness ($t(1,58) = -.76$, $p = .45$) or similarity to own face ($t(1,58) = 1.2$, $p = .23$). In addition a paired sample t-test was carried out on participants' PSEs from the pre-interaction self face recognition task, which showed no significant difference between the two faces ($t(1,58) = -.71$, $p = .48$). Moreover, there were no significant differences in either the amount of money sent to the two faces in the trust game ($t(1,58) = -.33$, $p = .74$) or in the amount of money participants expected to receive back from the player ($t(1,58) = -1.42$, $p = .16$).

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