Personality and Individual Differences 117 (2017) 60–65

Contents lists available at ScienceDirect

Personality and Individual Differences

journal homepage: www.elsevier.com/locate/paid

The interactive effect of facial appearance and behavior statement on trust belief and trust behavior☆

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ARTICLE INFO

Article history:
Received 28 December 2016
Received in revised form 11 May 2017
Accepted 20 May 2017
Available online 26 May 2017

Keywords:
First impression
Face perception
Trust
Decision-making
Trust game

ABSTRACT

We investigated the interactive effect of facial appearance and reputation based on past behavior on trust belief and trust behavior in a one-shot standard Trust Game with Chinese participants. The faces and behavioral statements of partners were sequentially displayed to the participants. The participants had to evaluate the partners' perceived trustworthiness and decide how much money they would invest, as well as how much money they would expect the counterpart to return. The results showed that the Chinese participants' economic decisions were influenced by partner facial appearance. We also found an interactive effect of facial appearance and behavioral statements, and a significant interaction of sequence and behavioral statements. Behavioral statements alone had an effect on perceived trustworthiness only when they were shown first, but they had no effect when the faces were displayed first. Behavioral statements had an effect only through their interaction with the faces. However, faces can affect perceived trustworthiness alone, regardless of sequence. Finally, we proposed a model for illustrating the relationships among facial appearance, behavioral statements, perceived trustworthiness, investment amount, and the amount of expected return.

1. Introduction

Trustworthiness is one of the most important factors in social and economic interactions. For example, Schlicht, Shimojo, Camerer, Battaglia, and Nakayama (2010) found that a face's trustworthiness could influence the wagering decisions in a poker game. Other researches (Stirrat & Perrett, 2010; van't Wout & Sanfey, 2008) adopted a well-studied Trust Game (Berg, Dickhaut, & McCabe, 1995) as a task and found that participants invested more in partners with trustworthy-looking faces.

Besides facial cues, trustworthiness judgments are also influenced by past experiences with people (Axelrod & Hamilton, 1981; King-Casas, Tomlin, Anen, Camerer, Quartz, & Montague, 2005). When people have little or no experience with their potential counterparts, especially before their first meeting, behavioral statements about their counterparts may play an important role in their personal judgments. However, the integration of appearance and behavioral cues is seldom studied, although it is important because people use both appearances (Todorov, Said, Engell, and Oosterhof, 2008) and behaviors (McCarthy & Skowronski, 2011) to predict future behaviors and to inform interactions. To the best of our knowledge, only a few studies have investigated the interactive effect of facial appearance and behavioral cues on cooperative economic decision-making.

Before we introduce these studies, we first introduce the Trust Game paradigm they used. The standard Trust Game involves two players, A (the sender) and B (the returner). Player A is endowed with an initial amount of money and can choose to invest any amount of this endowment with B. The amount that Player A invests is multiplied by some factor, and then Player B decides how much of this enlarged endowment, if any, he would like to return to Player A. Player B can choose to repay the investor's trust by returning more money than what was initially invested, or to abuse his trust by keeping all (or most) of the money. In this game, trust is operationally defined as the amount of money that Player A invests in his partner, and the degree of reciprocity is measured by the amount returned. A one-shot Trust Game features only one round. Meanwhile, a repeated Trust Game involves multiple interactions between the sender and the same returner, generally with 15 rounds.

With a repeated Trust Game, Chang, Doll, van't Wout, Frank, and Sanfey (2010) found that the decision made in the first round totally depends on facial appearance, whereas later trustworthiness evaluation and investment amount is dynamically updated based on experiences. Yu, Saleem, and Gonzalez (2014) also found that trusting beliefs and

☆ All authors contribute equally to this work. The listing names is in alphabetical order by surname. This work was supported by the National Natural Science Foundation of China (31170978, 11301555); the Major Program of the National Social Science Foundation of China (14ZDB015); the Fundamental Research Funds for the Central Universities (17wkzd19).

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http://dx.doi.org/10.1016/j.paid.2017.05.038
0191-8869/

trust-related behaviors were greater at the start of the repeated Trust Game for partners with trustworthy faces and were higher later in the game for partners who reciprocated. However, their study showed a different effect of new information on trust belief and trust behavior. They observed that a single experience does not affect people's reliance on facial appearance when forming the initial trustworthiness assessment, even when their previous expectations based on facial appearance were disconfirmed, but a single experience can influence trusting-behavior independent of trusting beliefs. Rather than using a repeated Trust Game, Rezlescu, Duchaine, Olivola, and Chater (2012) adopted a standard one-shot Trust Game to explore a possible interaction between initial impressions and reputational information by simultaneously presenting computer-generated untrustworthy faces or trustworthy faces and visual summaries of their partners' past reciprocations (just as one might receive third-party reports about potential business partners) to participants. Their results revealed significant main effects of behavioral history and facial cues but no interaction effect.

In the existing literature, whether Chinese participants' economic decisions would also be influenced by partner facial trustworthiness or behavioral trustworthiness remained unclear. On the one hand, according to well-documented cultural difference in social explanation (see Choi, Nisbett, & Norenzayan, 1999 for a review), compared with Westerners, Asians are less likely to use another person's personality traits in accounting for the person's behavior. Compared with European Americans, Asian Americans were less likely to spontaneously infer another person's personality traits (Na & Kitayama, 2011). On the other hand, Asians were as likely as Westerners to intentionally infer personality traits from faces (Na & Kitayama, 2011) and conduct spontaneous inference of traits from behavior (Uleman, 1987). Chinese are even more susceptible to facial traits inference, given the tradition of Chinese face reading, also called Chinese anthroposophy or "Mieng Shiang", comes from Chinese ancient philosophy Taoism (https://en.wikipedia.org/wiki/Mien_Shiang). Therefore, the first purpose of the present study is to explore whether the results in previous research with Western participants are universal, and could be generalized to Chinese people.

In our daily lives, we often need to decide whether to trust or cooperate with an unfamiliar individual based only on a one-shot impression from sequentially presented facial appearances and hearsay behavior history. However, none of the above studies has investigated this issue. Therefore, the second purpose of the present study is to investigate further the interactive effect of facial cues and behavioral cues on trust belief and trust behavior by presenting them sequentially in a one-shot Trust Game.

In each trial, one face and one behavioral statement were presented sequentially to one-half of the participants. The other half of the participants received treatment in a reversed order. Then, after this information disappeared, the participants were asked to assess how trustworthy they perceived the counterpart to be, using a nine-point Likert scale, how much money they would invest, and how much money they would expect the counterpart to return. Here, we define perceived trustworthiness as trust belief, the money invested as trust behavior, and the money expected to be returned as expected reciprocity. We adopted a structural equation modeling (SEM) approach to clarify the relationships among facial appearance, behavioral statements, explicit perceived trustworthiness, mean investment, and mean amount of expected return.

2. Method

2.1. Participants

The participants were 17 male and 25 female Chinese students ($M = 20.32$ years, $SD = 2.15$) recruited in one University of China. They were randomly assigned to two groups, the face-behavior group or the behavior-face group.

2.2. Design

Faces (high trustworthiness vs. low trustworthiness) and behavioral statements (high cooperativeness vs. low cooperativeness) were within-subject variables. The presentation sequence of faces and behavioral statements was a between-subject factor. The ratings of trustworthiness of each counterpart, the amount of the investment, and the expectation of a return from the counterpart were dependent variables.

2.3. Stimuli

We conducted two pilot studies to select high/low-trustworthy faces, as well as sentences describing high/low-cooperative behavioral information.

2.3.1. Faces

Forty-six pictures of Chinese faces (23 males, 23 females) with neutral expressions were used as stimuli in the pilot study. We used actual, un-retouched photographs as in Chang et al. (2010) and Yu et al. (2014) rather than computer-generated faces as in Rezlescu et al. (2012) to make the Trust Game more believable. Nineteen Chinese undergraduates (9 males, 10 females, $M = 20.48$ years) from one University in China rated their first impression of these faces on the basis of trustworthiness, cooperativeness, likability, dominance, attractiveness, and facial expression using a nine-point Likert scale to respond to prompts such as "my first impression of this face is trustworthy/cooperative/likable/dominant/attractive", "my first impression of this face's facial expression is neutral" (1 = strongly disagree, 9 = strongly agree). First, the two faces of each sex with the highest trustworthiness rating were selected as face stimuli. Then, considering the impact of facial expression on cooperation decisions (Alguacil, Tudela, & Ruz, 2015) and the "what is beautiful is good" stereotype (Dion, Berscheid, & Walster, 1972), two faces of each sex with the lower trustworthiness rating that matched with those most trustworthy faces of each sex on facial expression ($M_{high} = 4.78$, $M_{low} = 4.72$, $t(18) = 0.22$, $p = 0.83$) and on attractiveness ($M_{high} = 4.52$, $M_{low} = 4.49$, $t(18) = 0.19$, $p = 0.85$) were selected as face stimuli. The two groups of faces were significantly different on trustworthiness ($M_{high} = 5.78$, $M_{low} = 4.80$, $t(18) = 3.81$, $p < 0.001$), cooperativeness ($M_{high} = 6.23$, $M_{low} = 4.91$, $t(18) = 4.87$, $p < 0.001$), likability ($M_{high} = 5.47$, $M_{low} = 4.92$, $t(18) = 2.84$, $p < 0.05$), and dominance ($M_{high} = 4.48$, $M_{low} = 5.43$, $t(18) = -3.51$, $p < 0.01$).

2.3.2. Behavioral statements

Twelve of fifteen statements for measuring the cooperation of project teams (Pinto & Pinto, 1990) were selected and modified to apply to individuals instead of a project team. We narrated the positive sentences to describe high-cooperative behavior and the negative ones to describe low-cooperative behavior. For example, "he intentionally never provides/provides misleading information to other team members." Each statement was evaluated on cooperativeness with a seven-point Likert scale (1 = low cooperativeness, 7 = high cooperativeness) by twenty-one other Chinese students (10 male, 11 female, $M = 22.62$ years). Additionally, as in the idiom "Words are but wind, but seeing is believing", the veracity of the spoken word is doubtful. Thus, the truthfulness of each statement was also evaluated with a 7-point Likert scale (1 = low truthfulness, 7 = high truthfulness). Participants were instructed that "in a cooperative game, you need to decide whether to work with another person. At this moment, you receive some evaluation of your possible partner, but the evaluation may be true (e.g., when the evaluation comes from your collaborators), or false (e.g., when the evaluation comes from your competitors). Please rate each statement on cooperativeness and truthfulness based on your gut feeling."

To simulate the uncertainty of secondhand information in real life, we selected four negative statements around 4 (the middle of the 7-