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Original Article

The impact of friend-or-foe cues and survival pressure on trust in the investment game

Ziqiang Xin *, Zhixu Yang, Youhui Liu

Department of Psychology at School of Sociology and Psychology, Central University of Finance and Economics, Beijing 100081, China

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ABSTRACT

Prior research has shown that people place more trust in a counterpart referred to as a "partner" than as an "opponent" in a bargaining game. This is thought to be because the appellations "partner" or "opponent" serve as subtle cues activating a postulated friend-or-foe (FOF) mental module. However, no research has investigated the association between FOF cues and trust in an investment game from an evolutionary perspective. The present research demonstrates the effect of FOF cues on trust among Chinese samples in an actual investment game (Study 1) and in a hypothetical investment game (Study 2), and further demonstrates the moderating role of survival pressure on the association between FOF cues and trust—FOF cues influence trust in a scenario involving survival pressure but not in a scenario lacking survival pressure (Study 3). These findings are consistent with the existence of an adaptive FOF mental mechanism used by human beings to solve survival challenges.

1. Introduction

Despite the varying definitions of trust, most scholars agree that trust is a psychological state comprising the intention to accept vulnerability based on positive expectations of the intentions or behavior of another (Rousseau, Sitkin, Burt, & Camerer, 1998). Trust can vary as a function of social cues for trustees, such as facial trustworthiness (e.g., van't Wout & Sanfey, 2008), personal reputation (e.g., King-Casas et al., 2005), group membership (e.g., Tanis & Postmes, 2005; Xin, Xin, & Lin, 2016), and social identity complexity (e.g., Xin & Xin, 2014). Friend-or-foe cues (FOF cues), which are one variety of important social cues, can alter trusting behavior by merely labeling the trustee as either "partner" or "opponent", while keeping all the other factors fixed (Burnham, McCabe, & Smith, 2000).

To date, scholars have only investigated the effect of FOF cues on trust in a bargaining game among a western sample (Burnham et al., 2000); however, to our knowledge, no research has demonstrated it among other samples or explored it from a functional evolutionary perspective. The current research, therefore, aimed to investigate the effect of FOF cues on trust using a distinct economic decision-making task (the investment game) among culturally different samples (Chinese) and to explore the potential moderating role of survival pressure in the association between FOF cues and trust.

1.1. FOF cues and trust

In Burnham et al. (2000), they first manipulated FOF cues merely by denoting the counterpart as either "partner" or "opponent" in the instruction. They then assessed the likelihood of trusting behavior that individuals displayed toward a partner or opponent in an extensive form of bargaining game. Results indicated that the individuals matched with "partner" were more likely to display trusting behavior than those matched with "opponent".

Over the years, the above conclusion has been referenced by a growing body of academic research in experimental economics (e.g., Ellingsen, Johannesson, Mollerstrom, & Munkhammar, 2012; McCabe, Rigdon, & Smith, 2003), social psychology (e.g., Güroğlu, van den Bos, & Crone, 2014; Netzer, van Kleef, & Tamir, 2015), and other related fields (Boone, Declerck, & Suetens, 2008; Cronk, 2007). A close reading of the literature, however, shows that few further studies thus far have attempted to examine if the impact of FOF cues on trust could be replicated among other samples. Showing this would provide stronger evidence for the role that FOF cues play in the alteration of trust.

The best glimpse we have into this possibility is from a recent study by Güroğlu et al. (2014), in which participants in four age groups (9-, 12-, 15-, and 18-years old) from western cultures consistently tended to exhibit more trusting behavior toward their friends than toward opponents in a bargaining game. Unfortunately, their manipulation of FOF cues was performed via peer nominations in a pilot study in which trustees were labeled with the names of participants' actual partners or opponents in their classes; in this study, experimental instructions to denote the trustee as "partner" or "opponent" were absent. This methodological distinction means that these findings, in

* Corresponding author. Department of Psychology at the School of Sociology and Psychology, Central University of Finance and Economics, 39 South Xueyuan Road, Haidian District, Beijing 100081, China. Tel.: +86 10 62289120; fax: +86 10 62288651.
E-mail address: xinziqiang@sohu.com (Z. Xin).

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the strictest sense, cannot be construed as a replication of those from Burnham et al. (2000). The current research, therefore, aimed to further examine the reproducibility of the effect of FOF cues on trust by using the instructions to manipulate FOF cues.

Likewise, it is worthwhile to investigate whether there is an association between FOF cues and trust among Chinese samples. Despite no direct evidence on this issue, there has been cross-cultural evidence on prime-to-behavior effects indicating that the primes for competitiveness or cooperation can lead to different behavior outcomes between western and Chinese participants. For example, in Wheeler, Smeesters, and Kay (2011), western and Chinese participants were primed with competitiveness or cooperativeness before playing a social dilemma game with a competitive player. The results showed that westerners who played with a competitive player in the public good game were not subject to the primes for competitiveness or cooperativeness. On the contrary, when a Chinese participant played against a competitive player, their allocations were indeed influenced by whether they were primed with competitiveness or cooperativeness. Chinese participants tended to allocate more to a competitive player when primed with competitiveness compared to cooperativeness. This may be because the competiveness prime could make Chinese individuals perceive the game situation as more competitive; as a result, they may judge the competitive player as less competitive (Wheeler et al., 2011). These findings imply that culture can modify the impact of FOF cues manipulation on trust so that it is necessary to examine whether the FOF cues exert influence on trust among Chinese samples.

Other evidence has shown that while westerners display an in-group bias in resource allocation, East Asians (e.g., Chinese, Japanese) tend not to allocate more resources to their in-group members than to out-group members (e.g., Buchan, Johnson, & Croson, 2006; Falk, Heine, & Takemura, 2014). These findings can be interpreted in light of the focus of westerners on intergroup competition and the emphasis of East Asians on intergroup cooperation (Takemura, Yuki, & Ohtsubo, 2010). Extending this to the association between FOF cues and trust, it might be imprudent to conclude that such a relationship is culture-free without using an East Asian sample. Therefore, these cross-cultural findings, together with the above-cited evidence on culturally different prime-to-behavior effects, justify the need to explore the impact of FOF cues on trust among Chinese samples.

With respect to the instrument used to measure trust levels, previous studies (Burnham et al., 2000; Güroğlu et al., 2014) only used the bargaining game (McCabe, Rassenti, & Smith, 1996) to determine whether or not individuals displayed trusting behavior to trustees. They did not employ the investment game (Berg, Dickhaut, & McCabe, 1995) to measure the extent to which individuals displayed trusting behavior toward trustees. In other words, participants were only given the opportunity to make a binary choice between a trust option and a no-trust option, and were never given a chance to make a more nuanced response to display their trust level (indicating no trust, complete trust, or any intermediate level of trust).

Compared with the bargaining game, the investment game has virtues that might render it more sensitive to the great variability in trusting behavior across the conditions of the two FOF cues. Specifically, its continuous measure on the trust index (Liu & Xin, 2013) and its ability to be conducted both in a real investment situation and in a hypothetical survey (Holm & Nystedt, 2008; Song, Cadsby, & Bi, 2011) allow the investment game to function as a more precise instrument. Furthermore, the investment game is the most common instrument used to measure trust (Evans & Revelle, 2008). In the current research, we moved beyond a binary measure of trust vs. no-trust options and employed the investment game to observe the difference in trust across two conditions of FOF cues.

The general form of the investment game (Berg et al., 1995) is as follows. There are two players: the sender (trustor) and the receiver (trustee). At the beginning of the game, the sender is endowed with $100 (or $10). The sender decides how much of the money they would like to invest, and will keep the amount they do not invest. The receiver is given the triple the amount that the sender invests. Finally, the receiver determines how much money to return to the sender. Both the amount sent and the amount of expected return represent the sender's trust level. A greater amount sent and amount of expected return indicate a higher trust level.

Taken together, the first goal of the current research was to examine the role that FOF cues might play in trust in the investment game among Chinese samples. These findings will provide evidence as to the reproducibility and generalizability of the research conducted by Burnham et al. (2000). As Burnham et al. (2000) pointed out, the impact of FOF cues on trust can be interpreted as evidence for the existence of the FOF mental module. This module functions as an adaptation that can enhance individual reproductive success by allowing individuals to form expectations about the trustees' intentions in order to make a trust decision in a bargaining game (Burnham et al., 2000). Concretely, partners tend to be perceived as those with cooperative intentions to honor trust, whereas opponents tend to be perceived as those with competitive intentions to abuse trust (McCabe et al., 2003). Thus, we hypothesized that individuals interacting with a partner would exhibit more trust than those interacting with an opponent (H1).

1.2. Moderating role of survival pressure

Although the impact of FOF cues on trust has been demonstrated by prior research (Burnham et al., 2000; Güroğlu et al., 2014), it remains unknown whether the effect of FOF cues on trust is a “ubiquitous”, general effect. It can be argued that the effect of FOF cues on trust might be context-dependent but not ubiquitous for the following reasons.

According to the domain-specific theory of social cognition based on a functional evolutionary framework (Cosmides & Tooby, 1992, 1996), the brain is assumed to comprise a number of functional modular, domain-specific decision systems, each using somewhat different information as input and operating according to somewhat different rules adapted for solving problems in that domain. As a proposed functional module, the FOF mental module uses FOF cues as input and operates based on the rules adapted for solving problems in uncertain, potentially hostile situations of importance to survival (Burnham et al., 2000). This suggests that the FOF mental module might have been adapted for solving problems in the survival domain.

Unfortunately, Burnham et al. (2000) only demonstrated the existence of the FOF mental module, and neglected the boundary condition for the activation of such a module, particularly with respect to how such a module might relate to survival pressure. Showing this would contribute to the understanding of the mechanisms through which FOF cues might alter the trusting behavior that individuals displayed toward trustees. To address this research gap, the second aim of the current research was to explore the potential moderating role that survival pressure perceived by individuals might play in the association between FOF cues and trust in the investment game.

Despite the scanty direct evidence on the effects of survival pressure and FOF cues on trust, abundant studies exist on the association between survival pressure and intergroup cognition/behavior, which were enlightening for hypothesis formation in the current research. For instance, Becker et al. (2011) found that the salience of survival pressure increased individuals' accuracy in discriminating between faces of friends versus foes. These results can be interpreted as evidence of a self-protection vigilance mechanism that tunes the cognitive process to threat-connoting information (faces of foes) in the environment. Other evidence showed that the salience of pathogen threats, a historically prevailing source of survival pressure, can enhance in-group conformity (Griskevicius, Goldstein, Mortensen, Cialdini, & Kenrick, 2006; Wu & Chang, 2012). In-group conformity can be construed as a crucial signal to trust in-group members, or partners, over out-group members, or opponents, because conformity has been theorized as an in-group support in the fight against disease (Navarrete, Kurzban, Fessler, &