



How does materialism influence interpersonal trust? A social projection perspective

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Abstract

Past research has associated materialism with lower well-being. However, research on the effect of materialism on interpersonal trust and its underlying mechanism is limited. This research investigated how dispositional and situational materialism relate to interpersonal trust, as well as the mediation mechanism proposed based on a social projection account (social projection is a self-referential heuristic in which individuals assume others share similar mental experiences with them). Study 1 explored the associations of dispositional materialism with generalized and particularistic trust. The results showed that dispositional materialism could negatively predict generalized trust and particularistic trust in weak ties but could not predict particularistic trust in strong ties, and trustworthiness mediated the significant associations, aligning with the social projection principle. Study 2 examined the link between dispositional materialism and trust behavior in the trust game. The results showed that dispositional materialism negatively predicted trust behavior through the chain mediation effect of trustworthiness and social expectations about others' trustworthiness, supporting our predictions based on the social projection account. Study 3 examined the causal relationship between materialism and interpersonal trust by activating participants' materialistic orientation via situational cues (situational materialism). The results showed that situational materialism caused lower trust behavior, trustworthiness, and social expectations; however, situational materialism could not evoke the chain mediation effect proposed based on the social projection account. Our findings partially support the explanation of materialism-trust relation based on social projection and provide implications for trust promotion practice in the future.

Keywords Dispositional materialism · Situational materialism · Trust behavior · Trustworthiness · Social expectations · Social projection

Introduction

Interpersonal trust is crucial for both personal well-being and societal welfare. For individuals, interpersonal trust is regarded as an essential factor underlying social relationships (Arikewuyo et al., 2021) and subjective well-being (Zhang, 2020). At the societal level, it improves social solidarity and cohesion, which can reduce transaction costs, promote cooperation, and contribute to economic prosperity (Yamagishi & Yamagishi, 1994). However, previous studies have shown a downward trend in interpersonal trust over time in different countries. For example, Rahn and Transue (1998) and Hamamura (2012) documented the trust decline in American society; similar trends were also observed in the UK (Taylor-Gooby, 2005) and China (Zhang & Xin, 2019).

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One possible interpretation attributes the decline in interpersonal trust to the increased materialism with the booming consumer economy in the contemporary era (Bauer et al., 2012; Rahn & Transue, 1998). Psychologists have claimed that excessive material desires are destructive to social bonds (Kasser & Ryan, 2001) and prosocial tendencies (Moldes & Ku, 2020), which may, in turn, lead to mistrust among individuals. A few studies have provided empirical evidence of the negative link between materialism and interpersonal trust (Bauer et al., 2012; Rahn & Transue, 1998). However, these studies (1) focused only on generalized trust, while overlooking particularistic trust, (2) were primarily derived from Western samples, raising questions about the generalizability of such findings in the Eastern cultural contexts, (3) relied on self-reported measures of interpersonal trust, leaving their robustness for the behavioral measure uncertain, and (4) have not examined the psychological mechanisms linking materialism to interpersonal trust.

The present research aimed to address these gaps regarding the materialism-trust relation through three studies. We particularly focus on the mediation mechanisms proposed based on a social projection account of trust, which suggests a self-referential process of trust judgment in which individuals infer others' trustworthiness by using their own cooperativeness/trustworthiness as a reference (Krueger & Acevedo, 2005; Krueger et al., 2008, 2012; Thielmann & Hilbig, 2014).

Materialism and interpersonal trust

Materialism is defined as individual differences in people's long-term endorsement of values, goals, and beliefs emphasizing the importance of acquiring money and possessions that convey status (Dittmar et al., 2014). Such a value orientation encompasses the constant desire for success or a broader range of extrinsic goals, including image, fame, and financial success (Kasser & Ryan, 1996). While materialism can be a dispositional attribute, it can also be situational in that the materialistic orientation is activated by situational cues (Bauer et al., 2012; Moldes & Ku, 2020). For example, consumeristic cues (e.g., images of luxury goods) can raise individuals' material desires (Teng et al., 2016). Existing research has associated both dispositional and situational materialism with a variety of psychosocial outcomes, including depression and anxiety, negative self-concept, lower prosocial tendency, less social engagement, and lower levels of subjective well-being (see Dittmar et al., 2014; Moldes & Ku, 2020, for meta-analyses). Nevertheless, few empirical studies have directly explored the effect of materialism on interpersonal trust.

Numerous definitions and conceptualizations of interpersonal trust have been proposed (see Rousseau et al.,

1998; Thielmann, & Hilbig, 2015, for reviews). Despite this diversity, researchers from different fields concur that interpersonal trust fundamentally involves a willingness to accept vulnerability based upon expectations regarding interactions with others despite the intentions or behaviors of others being uncertain due to the lack of ability to monitor or control others (Mayer et al., 1995; Pfattheicher & Böhm, 2018). In this sense, interpersonal trust incorporates three key components: (1) it implies uncertainty and risk due to the trustor's lack of control over the trustee's actions; (2) it is based on the expectation that the trustee will act in the trustor's interest (demonstrating benevolence); (3) the dependence on others requires the trustor to accept personal vulnerability to potential betrayal (Thielmann, & Hilbig, 2015). Meanwhile, interpersonal trust can be categorized as generalized trust and particularistic trust (Glanville, & Shi, 2020). Generalized trust involves trust in general others based on the default positive expectation of the human nature of benevolence, which is often reflected as trust in strangers (Glanville & Shi, 2020; Yamagishi, 2011), while particularistic trust targets specific individuals or groups, such as families and friends, based on personal relationships where the social expectation is rooted in specific knowledge about the known others (Yamagishi & Yamagishi, 1994; Yuan et al., 2021). Compared with generalized trust, particularistic trust within personal relationships involves more knowledge about the specific trustees, a greater ability to monitor/control them, and relational commitments, which reduces the uncertainty of particularistic trust (Glanville & Shi, 2020; Yamagishi & Yamagishi, 1994).

To our knowledge, only three studies (in English) have directly examined the relationship between materialism and interpersonal trust (Bauer et al., 2012; Klein et al., 2018; Rahn & Transue, 1998). Rahn and Transue (1998), based on large-scale survey data, found that the popularity of materialistic values was linked to the decline in generalized trust among American high school students from 1976 to 1995. Bauer and colleagues (2012) found that situational materialism activated by consumer identity framing (where participants and other parties were labeled as "American consumers" in a resource dilemma scenario) would make Americans less likely to trust the other parties. And Klein et al. (2018) replicated Bauer et al.'s (2012) finding. These previous studies have revealed the negative effect of materialism on interpersonal trust. Nevertheless, several methodological, conceptual, and theoretical research gaps are identified (as below).

Methodologically, the existing studies assessed interpersonal trust using only self-report measures (three survey questions [Rahn & Transue, 1998] and a question in a hypothetical resource dilemma [Bauer et al., 2012; Klein et al., 2018]), which assesses social expectations about others'

trustworthiness (i.e., trust cognition). Based on the above-mentioned definition of interpersonal trust, economists and psychologists have introduced a behavioral measure, the trust game, operationalizing interpersonal trust as trust behavior (Ben-Ner & Halldorsson, 2010). The trust game captures a player's (trustor) tendency to voluntarily invest resources in a partner (trustee) to make more profits while accepting the vulnerability of loss due to the uncertainty of the partner's motivation, intention, and behavior. This paradigm reflects the major elements of interpersonal trust, namely *uncertainty*, *vulnerability*, and *positive expectations*. As the vulnerability component, in particular, might not be fully captured by the previously used general question(s) about the perceived trustworthiness of others, we aimed to supplement the literature with behavioral evidence based on the trust game.

In addition, the existent empirical evidence has been mainly derived from Western samples, especially the United States population (Bauer et al., 2012; Rahn & Transue, 1998). Such findings may not be applicable among Eastern samples, such as Chinese people. According to Ipsos (2020) and World Values Survey (n.d.), prevailing materialism and high interpersonal trust were coexistent among Chinese people. 70–78% of the Chinese residents showed materialistic value orientation (“I measure my success by the things I own”), over twice the global average (around 30%) and topping the list, while, in the same period, 60–64% of the Chinese believed most of the people could be trusted, almost triple the global average (about 20%). It seems prevailing materialism does not erode interpersonal trust in China. This might be due to China's intellectual heritage of Confucianism (Nisbett et al., 2001), which advocates self-transcendence and morality over benefit, thus reducing the negative effect of materialism on interpersonal trust. However, it could be inappropriate to generalize a rough country-level finding to the individual level. Thus, it is interesting to directly examine whether the negative link between individuals' materialism and interpersonal trust still exists in China. Nevertheless, to our best knowledge, studies specifically targeting Chinese samples are sparse.

Conceptually, the existent studies (Bauer et al., 2012; Rahn & Transue, 1998) only focused on materialism's impact on generalized trust; another type of interpersonal trust, particularistic trust, has been largely ignored. Admittedly, it is quite understandable that generalized trust (i.e., trust in general strangers) gained more attention because it reflects a crucial characteristic of modern societies marked by numerous daily interactions with unknown others (Yuan et al., 2021). Thus, while mainly focusing on generalized trust, as did previous studies, the present study also preliminarily investigated the relationship between materialism

and particularistic trust in familiar others (e.g., parents) who also play an important role in people's lives.

Theoretically speaking, the mechanism underlying the relationship between materialism and interpersonal trust is not clear. Previous studies have explained it based on human values theories (e.g., Schwartz et al., 2012), suggesting that materialism is the opposite of prosocial goals (e.g., benevolence, universalism); thus, materialism may decrease one's cooperativeness and prosocial tendency and lead to competitor expectations of and suspicious feelings about others (Bauer et al., 2012; Rahn & Transue, 1998). In other words, materialists might expect others to be as uncooperative and, therefore, untrustworthy as themselves. This psychological process of projecting one's own characteristics onto others has been defined as *social projection* in Social Psychology (Heck & Krueger, 2020). However, previous studies (Bauer et al., 2012; Rahn & Transue, 1998) merely noted this process as a default explanatory mechanism for the materialism-trust relation without further empirical evidence.

Theoretical foundations and hypotheses

The rationale underlying the explanatory mechanism of the materialism-trust relation is primarily grounded in theories of human values, social projection theories, and the egocentric anchoring-and-adjustment model.

Leading theories of human values, such as Schwartz's theory of basic human values (Schwartz et al., 2012), advocate that a certain value or goal is within a broader value system consisting of multiple values/goals that are hierarchically ordered and interrelated in a circumplex structure (Dittmar et al., 2014; Schwartz et al., 2012). Specifically, there is psychological consistency between adjacent values/goals, while conflict exists between values/goals that are distant and at opposite ends; therefore, prioritizing certain values can lead to a corresponding de-emphasis of conflicting values. From an evolutionary perspective, this is because humans are biologically and psychologically inclined to conserve resources (Halbesleben et al., 2014), hence prioritizing cognitive and emotional resources for valued goals. In line with these propositions, research has suggested that materialistic and prosocial values are at opposite ends in the spectrum of human values, and thus, an emphasis on materialistic values is likely to attenuate prosocial ones (see Figures A1 and A2 in the Appendix, for human value models). Such a dichotomy arises from the inherent differences between materialistic and prosocial values. While the former focuses on individual benefits and personal success, often leading to competition and self-centeredness, the latter is other-oriented, fostering cooperation, empathy, and altruism. Prosocial values foster a sense of community, interconnectedness, and mutual support, sharply contrasting

the self-centered and competitive tendencies of materialistic values (Moldes & Ku, 2020; Kasser, 2016; Schwartz et al., 2012). Therefore, materialists might be less prosocial and thus less trustworthy, as they are more likely to prioritize their own benefits over those of others. Empirically, materialism has been related to one's lower prosocial tendency and lower cooperativeness (Bauer et al., 2012; Moldes & Ku, 2020), which can be reflected as materialists' untrustworthiness in the trust context (Thielmann & Hilbig, 2014).

Drawing on social projection theories that suggest individuals tend to assume others have characteristics similar to their own (Heck & Krueger, 2020), it can be further argued that materialists may "project" their untrustworthiness onto others and assume others to be untrustworthy as well, which undermines interpersonal trust.

Specifically, in the face of uncertainty in the trust condition where direct information about others' trustworthiness is scarce, the trustor must form expectations about others' trustworthiness by resorting to alternative sources, such as social projection, as outlined in the person-situation framework of trust (Thielmann & Hilbig, 2015). Social projection is defined as an availability heuristic in which individuals assume others have similar attitudes, beliefs, and behaviors to themselves (Heck & Krueger, 2020; Thielmann & Hilbig, 2014). This phenomenon arises because people can never know others' minds with certainty, so they infer the characteristics of others by referring to their own (Krueger et al., 2008, 2012). Such a self-centered inference process has gained support from neuroimaging research on mirror circuits. For example, research has shown that introspection (self-reflection) and inference of others' mental states both activate the medial prefrontal cortex (Amodio & Frith, 2006), implying that individuals may use similar cognitive processes when reflecting on their own thoughts and feelings and when interpreting those of others. The social projection account of trust suggests that people project their own trustworthiness onto others to predict others' trustworthiness due to the uncertainty about others' actual trustworthiness (Krueger et al., 2008, 2012). Thus, a trustworthy individual may expect others to be trustworthy, whereas an untrustworthy individual might expect others to be untrustworthy as well (Thielmann & Hilbig, 2014, 2015).

Social projection has been regarded as a mechanism by which individual characteristics (e.g., cooperation orientation, altruism, and trustworthiness) affect social expectations about others' trustworthiness (Thielmann & Hilbig, 2014; Pfattheicher & Böhm, 2018). For example, a certain prosocial personality trait—honesty-humility—was found to be closely related to higher expectations about others' trustworthiness (Thielmann & Hilbig, 2014), and cooperative individuals in economic games also tend to expect

others to be cooperative and, therefore, trustworthy (Thielmann & Hilbig, 2014; Yamagishi et al., 2013).

Based on the discussion above, materialism, as the opposite of prosocial values, is associated with selfishness and uncooperativeness (Bauer et al., 2012; Kasser et al., 2007), thus related to low trustworthiness (Thielmann & Hilbig, 2014). Materialists may project their own low trustworthiness onto others. This would lead them to expect others to be untrustworthy as well (low trust cognition, which can be indexed by self-reported generalized trust; Yuan et al., 2021). In summary, dispositional materialism was expected to be negatively related to trustworthiness, which is, in turn, negatively associated with self-reported generalized trust. Thus, we hypothesized:

Hypothesis 1: The negative association between dispositional materialism and self-reported generalized trust is significant (Study 1).

Hypothesis 2: The mediation role of trustworthiness is significant in the association between dispositional materialism and self-reported generalized trust (Study 1).

Nevertheless, the social projection process seems to be contradictory to the research findings on individuals' *theory of mind /mentalizing*—the ability to understand others' mental states and to realize the self-other distinction in mental representations (Osterhaus & Koerber, 2021). Even children younger than two years old show a rudimentary ability to recognize differences between their own and other people's ongoing psychological experiences (Scott & Baillargeon, 2017). As such, the egocentric anchoring-and-adjustment model proposes that social judgments may be guided by a process where inferences about others' minds are initially based on personal experiences (i.e., social projection) and then adjusted with effort and in light of additional information about others (Wang et al., 2022). Therefore, the subsequent adjustment process could potentially disrupt or weaken social projection.

Regarding the link between materialism and interpersonal trust, based on the egocentric anchoring-and-adjustment model, the linkage may be particularly strong when generalized trust (trust in general others or strangers) is involved because there is limited additional information about others available to adjust the self-anchoring process (social projection). However, it might not be the case for particularistic trust in known others. Particularistic trust emerges in relationships that offer multiple sources of information about others' trustworthiness, such as interaction history and payoffs of relation maintenance, as suggested by an encapsulated interest account (Schilke et al., 2021). Thus, the trustor might no longer need to rely on social projection. Namely, one may easily adjust social inferences away from

the self-anchoring social projection by using his/her knowledge about familiar others as a guide (Gaesser, 2020). This can interfere with the social projection mechanism, thereby reducing the impact of materialism on particularistic trust in known others. Therefore, we proposed Hypothesis 3:

Hypothesis 3: The associations between dispositional materialism and self-reported particularistic trust in familiar others are nonsignificant (Study 1).

Apart from self-reported trust cognition (expectations about others' trustworthiness), generalized trust can be operationalized as trust behavior in the trust game (Pfattheicher & Böhm, 2018), which is more capable of catching the trust definition (as noted above). In the trust game, a participant's return amount as the trustee reflects his/her trustworthiness. The participants' amount sent as the trustor (trust behavior) demonstrates the extent to which they decide to trust the trustee (Ben-Ner & Halldorsson, 2010). Also, the trustor's expected return rate indicates the extent to which he/she has a positive social expectation about others' trustworthiness (Pfattheicher & Böhm, 2018). Trust behavior is based on expectations about others' trustworthiness (trust cognition) (Thielmann & Hilbig, 2015). According to the trust definition, trust behavior is a risky choice as the trustor's trust outcomes (gain or loss) completely depend on the trustee without the ability to monitor or control (Mayer et al., 1995; Pfattheicher & Böhm, 2018). Therefore, there are always possibilities of exploitation and betrayal from the trustee. Based on the betrayal aversion theory of trust (Aimone & Houser, 2012), individuals are more likely to engage in trust behavior when they expect a low risk of the trustee's betrayal. Past research has revealed that higher social expectations about others' trustworthiness are positively related to trust behavior (Pfattheicher & Böhm, 2018). However, as noted above, materialistic individuals tend to be less trustworthy. By projecting their untrustworthiness onto others, they may perceive a higher risk of others' betrayal (negative social expectations), thus less inclined to engage in trust behavior. Therefore, we expected that dispositional materialism is negatively related to trustworthiness, which is in turn positively related to social expectations, and then trust behavior. We developed Hypothesis 4 and Hypothesis 5:

Hypothesis 4: The negative association between dispositional materialism and trust behavior is significant (Study 2).

Hypothesis 5: The chain mediation role of trustworthiness and social expectations is significant in the association between dispositional materialism and trust behavior (Study 2).

In addition to dispositional materialism, this research also focuses on the effect of situational materialism (the materialistic cues that activate individuals' materialistic orientation) on interpersonal trust and the mediation mechanism. Based on the similar logic of our Hypotheses 4 and 5 in Study 2, we expected that situational materialism would lead to a lower level of trustworthiness; besides, through the social projection mechanism, this might further result in individuals' negative social expectations about others' trustworthiness, thus undermining trust behavior in the trust game. We formed our Hypothesis 6 and Hypothesis 7 as follows:

Hypothesis 6: Situational materialism leads to lower levels of trust behavior (Study 3).

Hypothesis 7: The chain mediation role of trustworthiness and social expectations is significant in the effect of situational materialism on trust behavior (Study 3).

Despite the theoretical possibilities of the above mediation mechanisms underlying the link between materialism and interpersonal trust, no research has directly examined such mediation mechanisms. There is a need for direct investigations into some previous studies' default assumption that the projected low trustworthiness of materialists explains the materialism-trust relation (Bauer et al., 2012; Rahn & Transue, 1998).

Overview of this research

The present study examined the relationship between materialism and interpersonal trust and the underlying mechanism. Specifically, we aimed to address four main questions. First, we examined whether materialism (measured as dispositional materialism) is negatively associated with self-reported interpersonal trust, including both generalized and particularistic trust (Study 1). Second, we tested whether the result could be replicated using the trust game, a behavioral assessment for generalized trust (Studies 2 and 3). Third, to further establish the causal relation, we investigated whether materialistic orientation activated by situational materialistic cues (situational materialism) would result in lower interpersonal trust (Study 3). Fourth, we explored the mediation mechanisms underlying the association between materialism and interpersonal trust (Studies 1, 2, and 3).

Study 1

In Study 1, we investigated the association of dispositional materialism (materialistic values) with self-reported generalized trust and particularistic trust. Similar to Thielmann and Hilbig (2014), participants' trustworthiness, indexed by altruism in the dictator game, was proposed as a mediator based on the social projection account of trust (Krueger & Acevedo, 2005; Krueger et al., 2008; Thielmann & Hilbig, 2014). Altruism in the dictator game refers to the intention to benefit others, even when doing so is costly (Pfattheicher et al., 2022), which has been used as a reliable indicator of trustworthiness in the trust context (Thielmann & Hilbig, 2014).

Methods

Participants

In this study, 1,350 university students from China participated in an online survey. The mean age = 19.22 ($SD = 1.71$). There were 685 (50.7%) female students, 490 (36.3%) students from urban areas, and 860 (63.7%) students from rural areas (detailed demographic characteristics are shown in Table 6A in the Appendix).

Procedures and materials

This study was run on a web-based survey platform. Participants joined the study through a link provided. After providing informed consent, participants were instructed to complete the main questionnaire consisting of self-report measures of materialism, generalized trust, and particularistic trust. Following the questionnaire, participants worked on the dictator game (the altruism measure). Finally, participants answered the demographic questions.

Materialistic values The Chinese version of the Material Value Scale (MVS-13) was used to assess materialistic values. The MVS-13 was developed by Li and Guo (2009) based on Richins and Dawson's Material Value Scale (MVS-18) which consists of three dimensions, success, centrality, and (material) happiness (Li & Guo, 2009). In this study, one item in the MVS-13 that may have an impact on social projection ("I value material things less than most people I know") was removed because this item implies the difference between respondents themselves and others; this may interrupt the self-referential heuristic (social projection) in the subsequent task. The 12-item MVS (MVS-12) was used in this study. Each item was rated on a 5-point Likert scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*. The average score across all items was used as the index

of materialism. The higher the score, the higher the level of materialism. In the confirmatory factor analysis (CFA), item 2 ("I like spending money on useless items") and its reverse-scored counterpart ("I only purchase useful items") were removed due to their small factor loadings (≤ 0.29). A 10-term MVS was used for the final analysis. The CFA results supported the three-dimensional structure of the scale (see Table A1 in the Appendix). In this study, the measure showed good reliability: Cronbach's $\alpha = 0.80$.

Generalized trust and particularistic trust Generalized trust was measured by the Generalized Trust Scale (GTS; Yamagishi & Yamagishi, 1994). In this scale, participants rated their agreement on six items using a 7-point scale (1 = *totally disagree*; 7 = *totally agree*). The mean of all items was used as the total score of generalized trust. The higher the score, the higher the level of perceived trustworthiness of others in general. CFA supported a unidimensional structure of the scale (see the Appendix), Cronbach's $\alpha = 0.91$. Particularistic trust was measured by items adapted from Yuan et al. (2021). In consideration of the social relationships of our participants (university students), we measured "how much do you trust your parents/friends/neighbors/classmates/teachers" (in total five items) on a 7-point scale (1 = *not trust at all*; 7 = *trust very much*). Participants' responses to each item were recorded separately.

Trustworthiness Trustworthiness was indicated by altruism in the dictator game, as did Thielmann and Hilbig (2014). In the dictator game paradigm, participants (Player 1) are normally given a certain amount of money and decide how much of the money they want to transfer to another participant (Player 2), and Player 2 will have no strategic input into the game's outcome. Higher allocations reflect higher levels of altruism (Piff et al., 2010). As an advantage over other games (e.g., the prisoner's dilemma game), the allocation in the dictator game is a pure measure of altruism that is not confounded with interpersonal trust (Thielmann & Hilbig, 2014). A hypothetical version of the dictator game (Thielmann & Hilbig, 2014) was used in this study. Participants were asked to divide an amount of 10 Chinese yuan (¥) between himself/herself and a hypothetical recipient. Participants reported the allocations on an 11-point scale (0–10). The hypothetical dictator game has been used in previous studies (e.g., Thielmann & Hilbig, 2014; Zhao et al., 2017) and yielded similar patterns of results to the incentivized (actual) dictator game without compromising validity (Zhao et al., 2017).

Control variables Demographic control variables, including gender, age, origin, and family income (an item from the Chinese General Social Survey [CGSS]-College Students

Table 1 Regression analyses of the predictive effects of materialistic values on particularistic trust and generalized trust (Study 1)

Variable	Particularistic trust					Generalized trust
	Parents	Friends	Neighbors	Classmates	Teachers	
Gender	−0.13*** (0.06)	−0.02 (0.07)	−0.12*** (0.08)	−0.22*** (0.07)	−0.13*** (0.08)	0.02 (0.02)
Age	0.03 (0.02)	0.02 (0.02)	0.00 (0.02)	0.00 (0.02)	−0.01 (0.02)	0.01 (0.06)
Origin	−0.06* (0.07)	−0.02 (0.07)	−0.07** (0.08)	−0.02 (0.08)	−0.03 (0.08)	−0.05* (0.06)
Family income	0.06* (0.02)	0.09** (0.06)	−0.00 (0.02)	−0.00 (0.02)	−0.04 (0.02)	−0.00 (0.02)
Materialistic values	−0.01 (0.05)	−0.02 (0.06)	−0.10*** (0.07)	−0.12*** (0.07)	−0.11*** (0.07)	−0.10*** (0.05)
ΔF	0.25	0.40	14.62***	21.22***	17.58***	13.26***
ΔR^2	0.000	0.000	0.010	0.015	0.013	0.010

Δ represents value change for adding materialism to the model; SE values are shown in the brackets

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

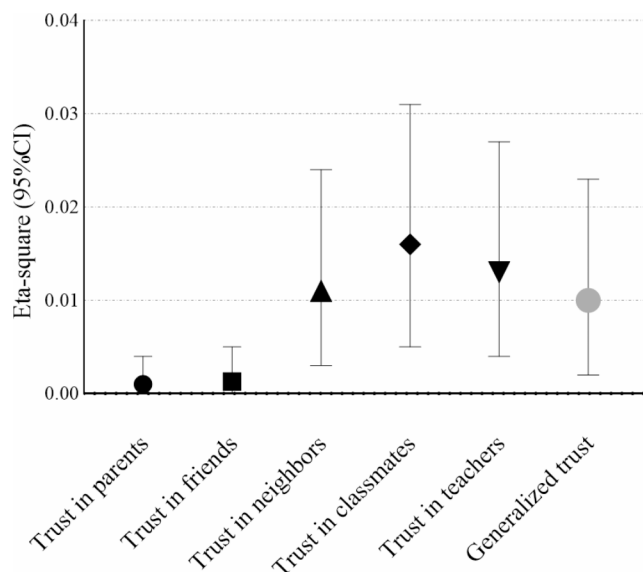


Fig. 1 Eta-squares of the predictive effects of materialistic values on particularistic trust and generalized trust. Materialistic values had smaller predictive effects on particularistic trust in parents and friends than other targets and generalized trust. *Note.* Error bars represent 95%CI

Survey 2019, <http://cgss.ruc.edu.cn/>), were used in this study.

Common method bias control

The Harman single-factor model was used to detect common method bias. The results showed that there were seven factors with eigenvalues greater than 1. The variance explained by the first factor was 21.3%, which is less than the threshold of 40%, indicating that there was no serious common method bias in this study.

Results and discussion

The results of descriptive statistics and the interrelations among the variables are shown in Table A1 in the Appendix in our supplementary material.

OLS regression was conducted to examine the associations of materialistic values with generalized trust and particularistic trust after controlling for gender, age, origin, and family income. The results are shown in Table 1. Materialistic values could significantly predict generalized trust ($\beta = -0.10, p < 0.001, \eta^2 = 0.010$) and could significantly predict particularistic trust in neighbors ($\beta = -0.10, p < 0.001, \eta^2 = 0.011$), classmates ($\beta = -0.12, p < 0.001, \eta^2 = 0.016$), and teachers ($\beta = -0.11, p < 0.001, \eta^2 = 0.013$) but could not significantly predict particularistic trust in parents and friends. Figure 1 shows the comparison of the strengths of the predicting effects (η^2). The predicting effects for particularistic trust in stronger ties (parents and friends) were smaller than those in weaker ties (e.g., classmates). These findings are consistent with Hypothesis 1 but only partially consistent with Hypothesis 3.

Using structural equation modeling (ML estimator) with the Bootstrap technique (1000 times resampling) in Mplus 8, we further examined the mediation role of trustworthiness in the relationship between materialistic values and generalized and particularistic trust. As the predictive effects of materialistic values on trust in parents and friends were not significant, we only focused on the particularistic trust in neighbors, classmates, and teachers, as well as generalized trust in the mediation analyses. The mediation role of trustworthiness was significant between materialistic values and generalized trust (standardized estimate = $-0.05, p < 0.001$), particularistic trust in neighbors (standardized estimate = $-0.04, p < 0.001$), trust in classmates (standardized estimate = $-0.05, p < 0.001$), and trust in teachers

(standardized estimate = -0.05 , $p < 0.001$), accounting for 35.8%, 31.5%, 30.9%, and 34.8% of the total effects respectively (for details, see Figure A2 and Table A3 in the Appendix). These results fully support Hypothesis 2 based on the social projection theories and partially support Hypothesis 3 based on the prediction of the egocentric anchoring-and-adjustment model.

To sum up, Study 1 replicated the result of the negative association between materialism and generalized trust reported by previous studies. It also found that materialistic values were negatively correlated with particularistic trust in neighbors, classmates, and teachers (weak ties) but not parents and friends (strong ties). Such a finding implies a social projection process, which is regarded as more likely to be evoked when social information is unavailable (when facing unfamiliar others) based on the anchoring-and-adjustment model. Besides, the strong affective bonds within strong ties can foster robust particularistic trust (Acedo-Carmona & Gomila, 2014), which may shield the impacts of materialism, thus resulting in the null effects of materialism on strong-tie trust. Therefore, the path analysis of the mediation effects focused only on generalized trust and particularistic trust in weak ties. The results of the mediation role of trustworthiness align with the social projection account. Namely, materialists project their own low trustworthiness onto others and expect general others and weak ties to be not trustworthy. In addition, as materialistic values could not significantly predict particularistic trust in strong ties (parents and friends), and particularistic trust in weak ties (neighbors, classmates, and teachers) seems equivalent to generalized trust in the materialism-trust link (similar results in regression and mediation analyses), we would not specifically investigate particularistic trust but only focused on generalized trust in the next two studies.

Study 2

In Study 2, we examined the relationship between dispositional materialism (materialistic values) and trust behavior in the trust game, as well as the mediation role of trustworthiness and social expectations (about others' trustworthiness).

Methods

Participants

In this study, 1,248 university students from China participated in an online survey (698 females, 55.9%). The average age = 19.20 ($SD = 1.78$). 451 (36.1%) students from urban areas and 797 (63.9%) from rural areas (detailed

demographic characteristics are shown in Table 6A in the Appendix).

Procedures and materials

The study was conducted using an online survey platform. Informed consent from each participant was obtained before they started responding to survey questions. In the survey, participants first completed the self-report measure of materialism. Then, they worked on the trust game task (two rounds), in which trust behavior, social expectations, and trustworthiness were assessed. After completing the trust game, they answered the rule check questions and reported their demographic information.

Materialistic values The same MVS-10 used in Study 1 was used to measure materialistic values in Study 2 with good reliability ($\alpha = 0.83$). The CFA result showed an acceptable model fit (see the Appendix).

Trust behavior The classic trust game (Xin et al., 2017) was used to assess trust behavior. In the first round, each participant (the trustor) was asked to assume they had ¥100 and decided to send ¥X ($X = 0-100$) to a hypothetical partner (the trustee) who would get 3X amount of money. The partner could return ¥Y ($Y = 0-3X$) to the participant. The amount sent (i.e., X) by the participants was used to represent their trust in the trustee. The hypothetical partner allows the trust game to be conducted in the form of a survey and has been widely used in previous studies (e.g., Tang & Gong, 2023; Xin et al., 2016, 2017). The survey version of the trust game has been found to yield equivalent patterns of results to the incentivized(actual) version (Xin et al., 2017).

Social expectations After sending out their money, participants reported how much they estimated the trustee would return (%), which was used to represent their social expectations about the trustee's trustworthiness (Thielmann & Hilbig, 2014; Xin et al., 2016).

Trustworthiness In the second round of the trust game, participants were asked to play the role of the trustee who gained ¥90 from the investment of a hypothetical partner (the trustor), and they decided to return ¥Z ($Z = 0-90$) to the partner. The amount they returned represents their trustworthiness.

Rule check Two rule-check questions were used to test whether the participants understood the rules of the trust game. The questions are "If you send ¥70 to your partner, how much will he/she get?" and "What are the upper and

lower limits of his/her rebate?” Participants answered the questions after they had completed the trust game. Finally, 58 participants who did not give the correct answers were excluded from the dataset.

Control variables The same control variables (gender, age, origin, and family income) as in Study 1 were used in this study.

Common method bias control

The Harman single-factor model was used to test for common method bias. The results showed that there were five factors with eigenvalues greater than 1. The variance explained by the first factor was 23.5%, less than the threshold of 40%, indicating that there was no serious common method bias in this study.

Results and discussion

The results of descriptive statistics and the interrelations among the variables are shown in Table A3 in the Appendix.

A multiple mediation model was established using Mplus 8. Structural equation modeling (SEM) (ML estimator) and the Bootstrap technique with 1000 times resampling were used to examine the hypothesized paths, with materialistic values as a latent variable indicated by the three dimensions (as noted above). The results of the SEM are shown in Fig. 2; Table 2.

As shown in Fig. 2, the model fitted the sample data well. Materialistic values could significantly and negatively

predict trust behavior. The chain mediating path: materialistic values → trustworthiness → social expectations → trust behavior was significant, accounting for 20.4% of the total effect, indicating that respondents’ materialistic values could make them less trustworthy, and by predicting others with themselves’ untrustworthiness as the reference, materialistic individuals had negative social expectations about another individual’s trustworthiness, thus showing lower trust behavior. The results support Hypothesis 4 and Hypothesis 5. However, the correlational data in this study limit the causal inference of the relationship between materialism and interpersonal trust. Thus, Study 3 employed an experimental design to examine the causal relationship.

Study 3

A computer-based lab experiment was conducted to examine the effect of situational materialism on trust behavior, social expectations, and trustworthiness. A path model was established to examine the mediation role of trustworthiness and social expectations in the link between situational materialism and trust behavior.

Methods

Power analyses and participants

As there was a relatively small sample size that we could obtain for the lab experiment, a sample that exceeded the minimum size required for detecting our focal effects was

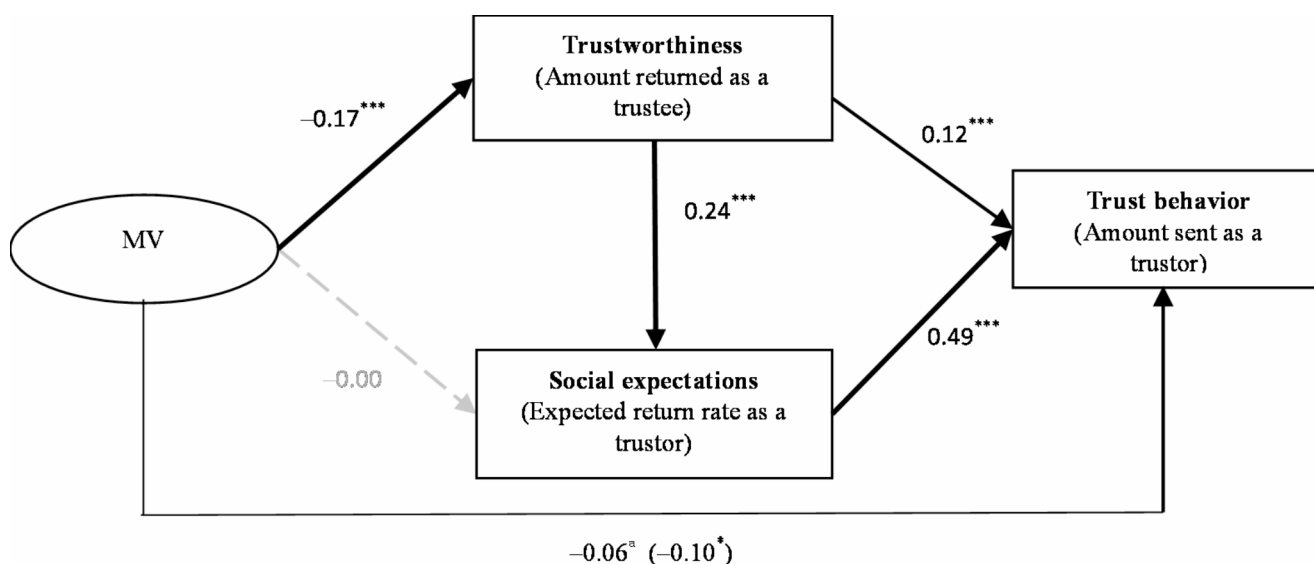


Fig. 2 The chain mediating effect of trustworthiness and social expectations between materialistic values and trust behavior ($\chi^2/df=5.17$, CFI=0.94, TLI=0.91, RMSEA=0.06, SRMR=0.04) (Study 2). *Note.* The significant path from trustworthiness to social expectations (about

others’ trustworthiness) aligns with the social projection principle. Controlling for gender, age, origin, and family income. MV=materialistic values; *marginally significant ($p=0.081$), $^*p<0.05$, $^{**}p<0.01$, $^{***}p<0.001$

Table 2 Total effects, direct effects, and indirect effects among variables (Study 2)

Path	Estimate	SE	Z	BC Bootstrap 95%CI	Standardized estimate
Total effects					
MV → trust behavior	−2.41	1.08	−2.24*	−4.19, −0.64	−0.10
MV → social expectations	−0.91	0.85	−1.07	−2.31, 0.48	−0.04
Trustworthiness → trust behavior	0.35	0.05	6.66***	0.26, 0.43	0.24
Direct effects					
MV → trust behavior	−1.38	0.79	−1.74 ^a	−2.68, −0.08	−0.06
MV → social expectations	−0.05	0.77	−0.06	−1.36, 1.11	−0.00
Trustworthiness → trust behavior	0.18	0.05	3.68***	0.10, 0.26	0.12
Indirect effects (mediation effects)					
MV → trust behavior (total indirect effect)	−1.04	0.58	−1.79 ^b	−1.99, −0.08	−0.04
MV → trustworthiness → social expectations	−0.86	0.31	−2.75**	−1.43, −0.38	−0.04
Trustworthiness → social expectations → trust behavior	0.17	0.02	−5.27***	0.12, 0.22	0.12
MV → trustworthiness → trust behavior	−0.52	0.20	−2.64**	−0.76, −0.62	−0.02
MV → social expectations → trust behavior	−0.03	0.43	−0.06	−0.74, 0.68	0.11
MV → trustworthiness → social expectations → trust behavior	−0.59	0.18	−2.69**	−0.79, −0.19	−0.02

MV = materialistic values; marginally significant ^a, $p=0.076$; ^b, $p=0.072$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

secured to mitigate any potential negative impact of this constraint. For a multi-way ANCOVA, a power analysis was conducted using G*power software. Power was set to 0.80 (Cohen, 1992), and a medium effect size $f=0.25$ was assumed (alpha level of 0.05). The result showed a required minimum sample size of 128. In addition, for mediation analysis, the Monte Carlo power analysis program was adopted with power=0.80, steps=10, and alpha level=0.05. Relevant information from previous studies and our Study 2 (r s ranged from −0.09 to 0.52) was used to estimate the required sample size. The result showed that a sample size of about 180 was needed to detect the chain mediation effect of trustworthiness and social expectations, which mirrors the social projection mechanism.

In this study, 182 Chinese college students were obtained as valid participants. There were 103 females (56.59%) and 105 from rural areas (57.8%). The average age=21.20 ($SD=2.10$) (detailed demographic characteristics are shown in Table 6A in the Appendix). A single factor between-subjects design was adopted in this study. Participants were randomly assigned to either the experimental group ($n=92$) or the control group ($n=90$).

Procedures and materials

The computer-based experiment included five steps. First, participants read the instructions on the screen and provided informed consent. Participants were informed that they would be paid ¥4 to evaluate some images that would be used in future research on visual perception, and they would use 100 tokens converted from the ¥4 to play a “reward distribution game” with other participants via the computer. Participants were told that the final tokens they had would be converted back to Chinese yuan (25 tokens = ¥1) at the end

of the study. Second, the participants completed a practice task (details are presented below) to familiarize themselves with the experiment before they were directed to the materialism manipulation. Third, after manipulation, the participants were shown the instructions of a two-round trust game before they responded to rule-check questions. Fourth, after passing the rule-check questions, the participants worked on the two-round trust game. Finally, participants provided their demographic information and answered the awareness check questions. In the end, participants were thanked and fully debriefed before they were paid through a banking App. The experiment program was developed in E-prime.

Practice task Participants were assigned to view five landscape images and asked to enter a number (1–7) to rate the pleasure they felt in response to each image.

Materialism manipulation Prior to the experiment, 24 materialistic images (e.g., luxury cars, luxury hotels, and jewelry) were selected online for materialism manipulation (Bauer et al., 2012). Another 24 images of landscapes were selected from the Internet for the control group (Bauer et al., 2012).

A pilot study was conducted as a manipulation check to examine the effectiveness of the manipulation. A total of 62 college students were recruited and randomly assigned to view the 24 materialistic images (materialism group, $n=31$) or landscape images (control group, $n=31$). Participants rated the pleasure they felt in response to each image with a number (1–7). After the manipulation, participants responded to two items (“I want a lot of luxury in my life” and “Owning material things can make me happy”) on a 7-point scale (1 = *strongly disagree*; 7 = *strongly agree*) as

an assessment of their situational materialistic orientation (Teng et al., 2016). The materialism group showed a significantly higher materialistic orientation ($M=4.89$, $SD=1.12$) than the control group ($M=4.19$, $SD=1.37$) ($t=2.18$, $p<0.05$, Cohen's $d=0.55$), indicating that the materialism manipulation was effective. In the main experiment, participants completed the same manipulation check as in the pilot study (but without a manipulation check to avoid its impact on subsequent tasks) (Bauer et al., 2012).

Rule check Two rule-check questions similar to those in Study 2 were used. If participants answered the rule-check question(s) incorrectly, they would be shown the game instructions again and asked to re-answer the questions (this procedure would repeat until they provided correct answers). The trust game would not start until participants answered both questions correctly. Thus, all participants correctly answered the rule-check questions before starting the trust game.

Trust behavior The trust game was adopted to assess participants' trust behavior. Participants interacted with partners simulated by the computer (though they were told they interacted with other participants through the computer). In the first round, participants played the role of the trustor (Player 1). They decided to send X tokens ($X=0-100$) as the trust investment to a partner (Player 2), and the amount sent reflects trust behavior. The instruction explained that Player 2 was another participant randomly selected among the trustees in our previous experiment, and participants were told that the return amount would depend on that trustee's return rate recorded in the computer (Yuan et al., 2021).

Social expectations After sending out their tokens, participants estimated how many tokens Player 2 would return (social expectations; rated on a 7-point scale: 0%, 17%, 33%, 50%, 67%, 83%, 100%; Ben-Ner & Halldorsson, 2010). After that, participants were told that Player 2's return amount would be included in their final token income, which would be displayed at the end of the task.

Trustworthiness In the second round of the trust game, participants played the role of a trustee. Participants were told that they received 60 tokens from the investment of another participant (Player 3) seated in the next room (Piff et al., 2010). Then, participants decided how many tokens to return. The amount returned reflects trustworthiness.

After returning tokens to Player 3, participants would receive the rebate ($0-3X$) from Player 2. At the very end of the study, participants were debriefed that their "partners" were actually performed by the experimental program and

that their payment would be fixed, ¥5.6 (regardless of their gains or losses in the game task; Piff et al., 2010). All participants understood and accepted the arrangement.

Awareness check Participants were asked whether they guessed the purpose of the experiment and whether they realized that the manipulation impacted the subsequent trust game. Four participants who correctly guessed the real purpose of the experiment or were aware of the influence of the manipulation on the subsequent trust game were excluded.

Control variables Apart from the demographic variables we included in Study 1 and Study 2, participants' pleasantness (recorded during the manipulation task) was included as a control variable in this study because the materialistic cues used to activate participants' materialistic orientation might cause the increase in pleasantness (Bauer et al., 2012).

Results and discussion

The results of descriptive statistics and correlation analyses are shown in Table A3 in the Appendix. A multi-way ANCOVA was conducted to examine the effects of materialism manipulation on trust behavior (amount sent), social expectations (expected return rate), and trustworthiness (amount returned). The results are shown in Fig. 3; Table 3.

After controlling for gender, age, origin, family income, and pleasantness, the main effects of materialism manipulation condition on trust behavior ($F_{1, 180} = 40.62$, $p<0.001$, $\eta^2=0.19$), social expectations ($F_{1, 180} = 28.93$, $p<0.001$, $\eta^2=0.14$), and trustworthiness ($F_{1, 180} = 34.70$, $p<0.001$, $\eta^2=0.17$) were significant.

A path model (ML estimator) with bootstrapping resampling = 1000 was established in Stata 16 to examine the mediation roles of trustworthiness and social expectations between materialism manipulation condition (materialism group = 1; control group = 0) and trust behavior, which reflects the social projection mechanism. The results of the path analysis are shown in Fig. 4; Table 4.

Materialism manipulation could negatively predict the amount sent, the amount returned, and the expected return rate, indicating that situational materialism undermined trust behavior, trustworthiness, and social expectations among individuals. However, trustworthiness could not predict social expectations, and the chain mediation effect was not significant (inconsistent with Hypothesis 7), indicating that situational materialism may not be able to trigger a social projection process. At the same time, materialism manipulation could significantly predict trust behavior through social expectations. This indicates that materialistic cues could directly lower individuals' social expectations about others' trustworthiness without projecting one's

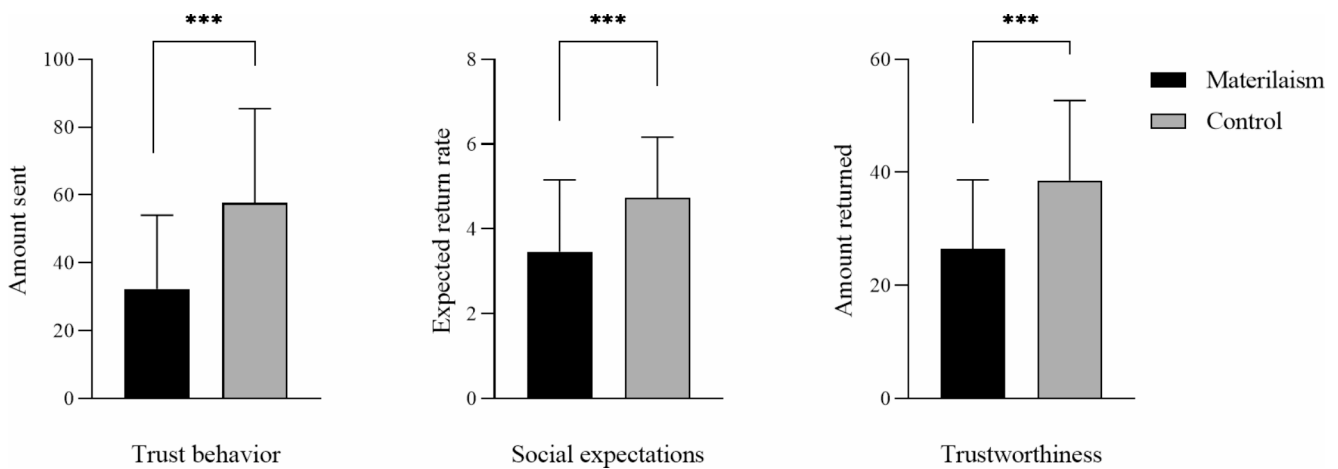


Fig. 3 The effects of materialism manipulation on trust behavior (amount sent), social expectations (expected return rate), and trustworthiness (amount returned) in the trust game. *Note.* Error bars represent *SDs*. The error bars based on *SDs* show variation in the data (as part

of descriptive statistics) but not the estimate errors, thus not indicating statistical significance. Our results indicate that the means differed significantly with a certain extent of overlap in data between the two groups (Krzywinski & Altman, 2013). *** $p < 0.001$

Table 3 The effects of materialism manipulation on trust behavior (amount sent), social expectations (expected return rate), and trustworthiness (amount returned) in the trust game (Study 3)

Condition	<i>n</i>	Trust behavior (Amount sent)		Social expectations (Expected return rate)		Trustworthiness (Amount returned)	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Materialism group	92	32.30	21.76	3.46	1.70	26.49	12.18
Control group	90	57.63	27.81	4.73	1.43	38.56	14.14
$F_{(1, 180)}$		40.62***		28.93***		34.70***	
η^2		0.19		0.14		0.17	

Controlling for age, gender, origin, family income, and pleasantness

*** $p < 0.001$

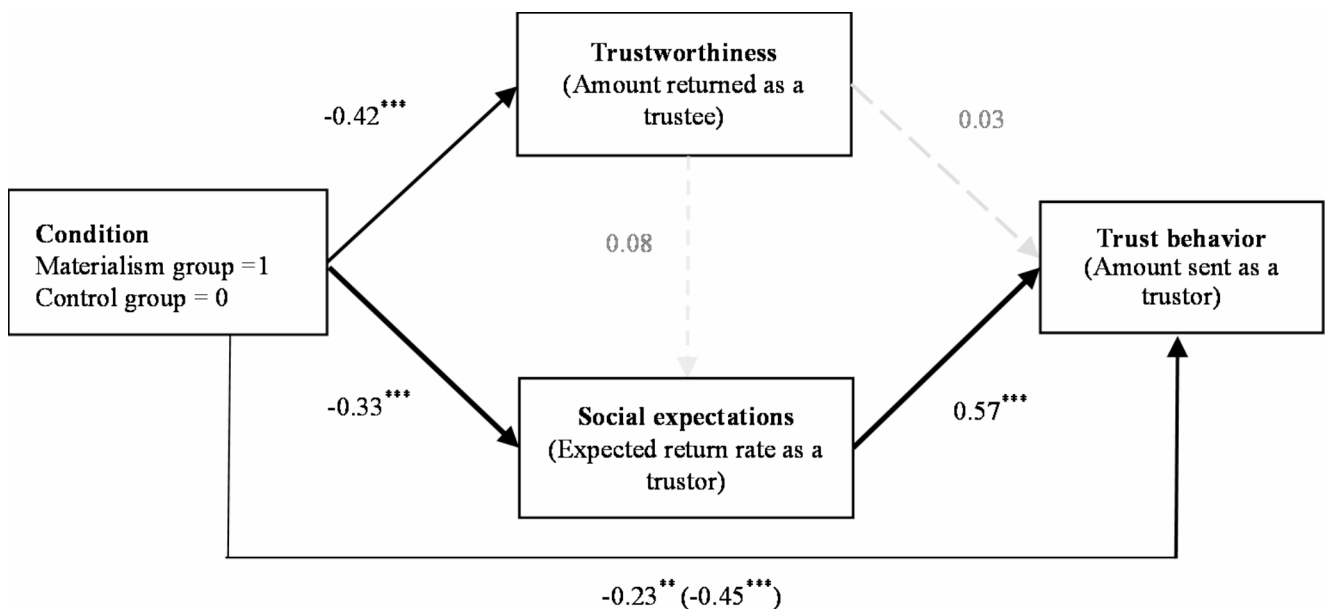


Fig. 4 The mediation role of social expectations (but not trustworthiness) between manipulation condition and trust behavior (Study 3). The path (from trustworthiness to social expectations) proposed based

on the social projection account was nonsignificant. *Note.* Controlling for age, gender, origin, family income, and pleasantness; ** $p < 0.01$, *** $p < 0.001$

Table 4 Total effects, direct effects, and indirect effects among variables (Study 3)

Path	Estimate	SE	Z	BC Bootstrap 95%CI	Standardized estimate
Total effects					
Materialism → trust behavior	−25.00	4.06	−6.16***	−32.95, −17.05	−0.45
Materialism → social expectation	−1.21	0.24	−4.95***	−1.69, −0.73	−0.36
Trustworthiness → trust behavior	0.13	0.15	0.89	−0.16, 0.43	0.07
Direct effects					
Materialism → trust behavior	−13.05	4.32	−3.02**	−21.52, −4.57	−0.23
Materialism → social expectation	−1.11	0.30	−3.73***	−1.69, −0.52	−0.33
Trustworthiness → trust behavior	0.02	0.12	0.43	−0.18, 0.29	0.03
Indirect effects (mediation effects)					
Materialism → trust behavior (total mediation effect)	−11.95	3.15	−3.80***	−17.87, −6.16	−0.21
Materialism → trustworthiness → social expectation	−0.11	0.11	−0.93	−0.33, 0.12	−0.03
Trustworthiness → social expectation → trust behavior	0.08	0.09	0.93	−0.09, 0.26	0.04
Materialism → trustworthiness → trust behavior	−0.62	1.44	−0.43	−3.45, 2.21	−0.01
Materialism → social expectation → trust behavior	−10.69	3.18	−3.36**	−16.93, −4.44	−0.19
Materialism → trustworthiness → social expectation → trust behavior	−1.02	1.08	−0.94	−3.13, 1.10	−0.02

Materialism represents the materialism condition that activates materialistic orientation

** $p < 0.01$, *** $p < 0.001$

own trustworthiness. We will further discuss the different mechanisms elicited by dispositional materialism (in Study 2) versus situational materialism (in Study 3) in General Discussion.

Pooled analyses

A within-study meta-analysis (Yuan et al., 2021) was run to quantify the overall predictive effect of materialism on interpersonal trust across the three studies. To ensure the independence of each sample in the meta-analysis, we selected the result of each study yielded by only one measure when there were multiple measures for a variable (Lipsey & Wilson, 2001); thus, particularistic trust was not included in the analysis ($k=3$, $N=2,780$). Hedges's g was used to compute the mean effect. The results showed that materialism exerted a negative and medium-sized effect on interpersonal trust in this research, $\bar{g} = -0.44$, 95% CI = $[-0.73, -0.14]$, $Z = -2.90$, $p < 0.001$ (random-effects model; $Q=24.19$, $p < 0.001$).

Furthermore, to integrate our results with past research, one previous individual-level study (Bauer et al., 2012) and its replication (Klein et al., 2018) were included in the meta-analysis ($k=5$, $N=9,465$), while the country-level finding (Rahn & Transue, 1998) was not included. The results showed that materialism, in general, had a negative and medium-sized effect on interpersonal trust, $\bar{g} = -0.38$, 95% CI = $[-0.57, -0.20]$, $Z = -3.99$, $p < 0.001$ (random-effects model, $Q=42.64$, $p < 0.001$).

General discussion

This research examined the association between materialism and interpersonal trust as well as its mediation mechanism and causality among Chinese samples in three studies. Based on the theories of human values, social projection theories, and the egocentric anchoring-and-adjustment model, we hypothesized that materialism would undermine generalized trust (but not particularistic trust) by eroding materialists' own trustworthiness. The results of the three studies partially support this mechanism.

Firstly, we conducted a pioneering study (Study 1) examining dispositional materialism's associations with both generalized trust and particularistic trust, which showed differential results between generalized trust and particularistic trust in strong ties (parents and friends). The results for particularistic trust in weak ties (neighbors, classmates, and teachers) are similar to that for generalized trust. Specifically, participants' materialism could negatively predict generalized trust, consistent with previous studies (Bauer et al., 2012; Rahn & Transue, 1998) and particularistic trust in weak-tie others through their own trustworthiness, consistent with our hypotheses based on human value theories and social projection theories, while materialism could not predict particularistic trust in strong ties, partially consistent with Hypothesis 3, indicating that materialism may have stronger consequences on people's interactions with strangers and weak-tie others than it does for strong ties. In other words, strong-tie trust is more resistant (than generalized trust and weak-tie trust) to the detrimental impact of materialism. Such a result aligns with prior research, which indicates that particularistic trust within close relationships is more resilient and steadfast than generalized trust, even

in less favorable conditions for trust (Acedo-Carmona & Gomila, 2019). Our finding can also mesh with the social projection account from the perspective of social information availability based on the egocentric anchoring-and-adjustment model. Namely, strong ties (higher familiarity) can provide more relevant information to people for adjusting their social inference away from social projection, thus preventing materialists from projecting their own low trustworthiness on familiar others, as we discussed in Study 1. In addition, apart from the anchoring-and-adjustment explanation for the nonsignificant results regarding strong-tie trust, the null effects might also be due to the stronger affective bonds within strong-tie relationships, which could generate robust particularistic trust (Acedo-Carmona & Gomila, 2014), thus less likely to be impaired by materialism.

Secondly, we adopted the trust game task to replicate the findings above and further examined the causality between materialism and interpersonal trust. The results of the main effects of dispositional materialism (Study 2) and situational materialism (Study 3) are congruent. Both of them were related to lower trustworthiness, social expectations, and trust behavior. On the other hand, however, the results of mediation analyses showed quite different pictures between dispositional and situational materialism. Specifically, the chain mediation path (from trustworthiness to social expectations about others' trustworthiness) proposed based on the social projection account was only detected for dispositional materialism (consistent with Hypothesis 5) in Study 2 but not situational materialism (inconsistent with Hypothesis 7) in Study 3. The different results between the two forms of materialism might be because untrustworthiness caused by dispositional materialism (materialistic values) is more internalized, stable, and internally available for social projection than that caused by temporarily activated materialistic orientation. Although previous studies on self-anchoring have shown that short-term states (e.g., emotions) are also available for social projection (Overbeck & Droutman, 2013), empirical findings, specifically of the projection of trustworthiness caused by short-term(situational) materialism, are rare. Future research can further examine whether situational materialism or other situational states can trigger the social projection of trustworthiness.

Despite the nonsignificant social projection path in Study 3, situational materialism could affect trust behavior through social expectations. This might be because the materialistic cues (i.e., luxury images) can serve as situational trust cues, which may yield probabilistic information for the trustor's inference about others' likely trustworthiness as suggested by Brunswik's lens model (Thielmann & Hilbig, 2015). Specifically, the luxury images could spotlight a consumerism culture in society (Dittmar et al., 2013), implicitly reminding the trustor about the environment of

consumerism where people could be materialistic in general and thus untrustworthy. Because individuals' knowledge, concepts, and experiences are stored in a network structure, if a concept in this structure is activated, some closely related concepts are also activated (Zhang & Xin, 2016). Therefore, elicited concepts related to the consumerism culture might activate related concepts such as "overnight millionaire," "profiteer," and "self-interest," which were probably used sequentially (and heuristically) as a reference to the judgment of others' trustworthiness, thus leading to negative social expectations and lower trust behavior. Moreover, because the materialistic cue exposure was temporary, the concepts that undermined trustworthiness might not have been internalized enough to trigger social projection, which explains the nonsignificant connection between impaired trustworthiness and social expectations about others' trustworthiness in Study 3. Certainly, such conjecture needs to be examined by future research.

Previous studies found that the effects of situational materialism on various psychosocial outcomes are similar to that of dispositional materialism (see Moldes & Ku, 2020, for a meta-analysis). Nevertheless, our findings imply that although the impacts of dispositional and situational materialism are similar, the impact mechanisms of the two forms of materialism might be different.

Implications, limitations, and future research

The present research expands the literature on materialism's impacts on individuals' psychological processes and behaviors by providing empirical evidence of the effect of materialism on interpersonal trust, which has only been examined by a few studies so far (i.e., Bauer et al., 2012; Klein et al., 2018; Rahn & Transue, 1998). Our findings also offer a new perspective to the current debate on whether materialism is truly problematic for individuals. Recently, as a challenge to the conventional view of self-determination theorists that materialism is invariably detrimental to people's well-being (see Dittmar et al., 2014), some researchers argue that materialism is not necessarily harmful but even beneficial to individuals since it functions as compensation for a sense of insecurity and can improve subjective well-being (Li et al., 2017). Indeed, some empirical studies have shown that materialistic goals do not necessarily reduce subjective well-being (see Zhou et al., 2022, for a meta-analysis). However, despite materialism's questionable effect on hedonic happiness, it inhibits interpersonal trust, according to our findings. Besides, materialists showed lower trustworthiness in this research, which might not directly affect themselves but can harm the interests of other people. In the

future, researchers can include the interpersonal perspective in their debates on the effects of materialism.

Our findings enrich the existing analytical framework for the materialism-trust relation by including particularistic trust in different targets as the outcomes with differential findings between strong-tie trust versus weak-tie and generalized trust, implying that findings from other studies on generalized trust (e.g., Thielmann & Hilbig, 2014) might not apply to particularistic trust in strong ties either. More research can incorporate and compare the two trust types in the future. Besides, scholars have argued that generalized and particularistic trust are not entirely dichotomous (Schilke et al., 2021). In this research, drawing upon the anchoring-and-adjustment model (Wang et al., 2022), we attempted to explain the discrepant results between these two trust types within a “spectrum” shifting (by information-based adjustment) from social projection (for generalized trust) to specific information-based inference (for particularistic trust in strong ties) (as discussed above). This approach may assist with overcoming the dichotomy between generalized and particularistic trust. Future research can explore this direction. Practically, these findings imply that fostering stronger relationships and promoting information sharing could be instrumental in building and maintaining particularistic trust, even among materialists. This could have applications in diverse fields, from enhancing workplace or business cooperation to facilitating positive relationships in therapeutic settings. Nevertheless, more evidence is needed before we draw a solid conclusion regarding particularistic trust, as we did not conduct more detailed investigations into this aspect because this research focuses mainly on generalized trust. Future research can further explore materialism’s effects on particularistic trust in various targets by quantifying the familiarity of targets or manipulating the availability of target information. Besides, we did not further provide behavioral and causal evidence for particularistic trust (as we did for generalized trust) because of the nonsignificant connection between materialism and particularistic trust in strong ties and the presumably equivalent meanings of weak-tie trust and generalized trust in the materialism-trust link (reflected by their similar results in regression and mediation analyses). Even so, there might still be potentially different findings if we employ behavioral measures or an experimental design for particularistic trust, which can be examined by future research.

This research expands the social projection literature by revealing that social projection can also be used to explain the materialism-trust linkage, similar to how it explains other traits-trust linkages (e.g., Thielmann & Hilbig, 2014; Pfattheicher & Böhm, 2018). Moreover, our findings suggest that untrustworthiness caused by dispositional materialism might be more likely to be projected onto others than that

caused by situational materialism, implying that the function of the social projection process in social understanding may vary depending on the levels of stability or internalization of one’s personal characteristics. Future research can further examine this finding or investigate this phenomenon in other dispositional and situational psychological constructs. Furthermore, by revealing the social projection mechanism between materialism and interpersonal trust, this research provides a possible direction for future nudge practice or interventions aiming to promote interpersonal trust. As it might be difficult (or questionable) for behavioral or psychological interventions to eliminate individuals’ materialistic values directly, the alternative approach to mitigate the adverse effect of materialism on interpersonal trust could be reducing the effect of the social projection process of materialistic individuals. Future research can explore potential moderators or interventional techniques, which can be applied in trust-promotion programs or “wise interventions” (see Brockner & Sherman, 2019, for a review on this kind of social psychology intervention) for a team, an organization, or a society. Specifically, the awareness of interpersonal heterogeneity and perspective-taking skills may be able to whittle the automatic social projection process and promote materialists’ interpersonal trust. For example, wise interventions (that focus on altering appraisal and mindsets) can try to embed the belief of “interpersonal heterogeneity” in materialists’ minds; and trust promotion programs can implement perspective-taking exercises. These may reduce egocentric biases and help materialistic individuals recognize the potential for trust in and cooperation with others. Of course, the specific intervention techniques and their effectiveness need to be further explored by future research.

The present research also contributes to the literature by providing evidence from China. It is worth mentioning that although the country-level data (as we cited in the Introduction) showed that prevailing materialism and high interpersonal trust were coexistent in Chinese society, those data are too rough to draw a correlational conclusion, not to mention causality. Our findings at the individual level indicate that the negative association between individuals’ materialism and generalized trust found in previous studies still exists in China, verifying the generalization of previous findings. On the other hand, our findings on particularistic trust in strong ties showed a different picture with weak-tie trust and generalized trust, which we have interpreted above based on the social projection mechanism and affective bonds. However, it might also have something to do with China’s collectivist culture that emphasizes strong interpersonal ties (e.g., family and relatives), which can be further examined by future research with cultural variables involved.

Even more to the point, as there is a significant trust decline in Chinese society over time found by previous

cross-temporal studies (e.g., Zhang & Xin, 2019), economic research has attributed this trend to the marketization and economic growth over the past decades in China (Zhang & Xin, 2019), providing an external and country-level perspective for the trust decline. Our research, otherwise, focuses on an internal consequence of market economy growth (materialism), deepening the understanding of the cause and psychological mechanism of trust decline in China from an individual-level perspective. The individual-level findings can provide implications for the development of behavioral and psychological interventions for trust promotion (as noted above). Besides, with the rapid growth in the market economy in China, materialism might have become a drive for Chinese people to pursue wealth, career success, and a better quality of life, which may, in turn, boost the economy and improve societal welfare as a whole. However, according to our findings, the prosperity built on materialism is likely at the cost of interpersonal trust. Given the crucial role of interpersonal trust in social cohesion and economic prosperity (Yamagishi & Yamagishi, 1994), mistrust caused by excessive materialism could be detrimental to the economy, societal welfare, and quality of life in the long run. Future research can try to integrate the macro and micro perspectives with a cross-disciplinary approach and multi-level design, providing a more holistic analytical framework for economic growth, materialism, and interpersonal trust.

The present research has limitations, which could also be avenues for future studies. First, we only included university students in this research. University students, as emerging adults, do deserve our attention as they are at an important stage of values formation and might be vulnerable to the impact of materialism. However, the applicability of our results to other age groups remains uncertain. Future research should consider the inclusion of a broader range of age groups. Second, our data were collected from a single region, the Sichuan province in China, which may limit the generalizability of our findings. For example, there might be larger trust networks and higher generalized trust levels among the participants from regions with economic scarcity (Acedo-Carmona & Gomila, 2015), which may offset the detrimental impact of “risk factors” (e.g., materialism) on interpersonal trust. While we mitigated this by controlling for relevant demographic variables (e.g., urban-rural origin), we still encourage future research to examine our findings further and explore the moderating role of ecological and cultural factors in a broader context, utilizing nationally representative or multinational samples with diverse socioeconomic backgrounds. Third, in Study 1 and Study 2, we used a hypothetical version of economic games, considering the expenses of the game tasks with actual monetary income in the relatively large samples. Although the hypothetical versions of these two game tasks have been used in previous

studies (Thielmann & Hilbig, 2014; Xin et al., 2016, 2017), the results might be affected by their hypothetical nature. To make up for this limitation, we adopted the trust game with actual monetary income in a lab experiment in Study 3 but with a relatively smaller sample size. Future research can employ the actual version of economic games in larger-scale and more representative samples to test our findings. Fourth, self-reported measures of materialism in Studies 1 and 2 may be influenced by social desirability bias. Future research can explore more objective measures (e.g., luxury consumption). Fifth, the standardized psychological and behavioral measures (i.e., the Generalized Trust Scale and the trust game task) may not fully capture the complexity of interpersonal trust in real life. While our use of the Particularistic Trust Scale that measures trust in particular people in real life may, to a certain extent, make up for this limitation, future research can further explore measures of real-life interpersonal trust via field experiments, in-depth interviews, or case analyses. Finally, we conducted our investigations exclusively into interpersonal trust, while trust in other entities, such as trust in government and trust in policies, was ignored. A future study can investigate the effects of materialism on other kinds of trust.

Conclusion

People with higher dispositional materialism report lower generalized trust and lower particularistic trust in weak ties (but not strong ties), and they also show lower levels of trust behavior in the trust game. Individuals' dispositional materialism predicts lower interpersonal trust through their own untrustworthiness, consistent with our predictions drawing on the social projection account. On the other hand, activating individuals' materialistic orientation (situational materialism) also leads to lower interpersonal trust, while the mediation path proposed based on the social projection process does not exist. These findings suggest that materialism can undermine trust in general others (including weak ties), but it cannot erode trust in strong ties; the negative association of dispositional materialism with interpersonal trust can be explained by the social projection process, while social projection account cannot explain the effect of situational materialism. Future research can further explore the reasons for the different results between generalized trust and particularistic trust in strong ties, as well as the differential impact mechanisms of dispositional and situational materialism. Our findings can be used as a reference for future intervention and nudge program development. More studies among different populations, from cross-disciplinary perspectives, or involving trust in other entities are needed in the future.

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Data and material availability The datasets and materials used in the research are available and can be obtained by emailing zhoukaiji20@gmail.com.

Declarations

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Ethical approval was received from the Academic Committee of Sichuan Normal University.

Informed consent Informed consent and assent were obtained from all individual participants included in the studies.

Conflict of interest The authors declare no competing interests.

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