Current Psychology (2023) 42:27401–27414
https://doi.org/10.1007/s12144-022-03675-x

# Linking objective and subjective social status to altruistic sharing in China: the role of empathy

**Bingying Wei[1] · Xuran Zhang[1] · Dan Cui[1] · Yanfang Li[1]**

Accepted: 18 August 2022 / Published online: 21 October 2022


## Abstract

Based on social cognitive theory of social class and the empathy-altruism hypothesis, social status has a negative effect on altruistic sharing and empathy may be one of the underlying social cognition mechanisms. The current study comprehensively examined the relationship between social status, including both objective (i.e., income and education) and subjective (i.e., subjective wealth, power, and prestige status) aspects, and altruistic sharing, as well as the mediating role of empathy (i.e., cognitive empathy, positive empathy, and negative empathy) in China. The participants were 1,712 Chinese adults (63% females; age 30–58; $M_{age}$ = 38.54 years, $SD$ = 4.16). They were asked to complete an online survey that included objective and subjective measurements of social status, self-reported empathy, and a dictator game. The results showed that: (1) Objective social status was negatively correlated with altruistic sharing, whereas subjective social status was positively associated with altruistic sharing. Particularly, the objective social status factor of education and subjective power status seem to play dominant roles. (2) Cognitive and negative empathy played underlying mediation mechanisms between social status and sharing. Specifically, a higher income was related to higher cognitive empathy, which was positively associated with altruistic sharing. Conversely, education was negatively associated with negative empathy, which was positively related to altruistic sharing. The three components of subjective social status were linked to altruistic sharing through negative empathy, while subjective prestige status was positively linked to negative empathy, and subjective power and wealth status were negatively associated with negative empathy. Overall, these findings implied that the relation between social status and altruistic sharing is complex, involving the specific measurement indicators of social status. Cognitive and negative empathy are the underlying mediation mechanisms. These findings partly support social cognitive theory of social class and provide empirical evidence from China.

**Keywords** Social cognitive theory of social class · Empathy-altruism hypothesis · SES · Subjective social status · Empathy · Altruistic sharing

## Introduction

Social status, including the objective discrepancy in various material resources (mainly referring to income, education, and occupation) and the subjective sense of asymmetry caused by it, has been known as a profound and ubiquitous dimension of social life (Kraus et al., 2012). Objective social status (OSS) and subjective social status (SSS) have an important influence on individuals' cognition and behavior (Guinote et al., 2015) and help shape the interactions of everyday social life (Van Doesum et al., 2017). Currently, the theme of the relation between social status and prosocial behavior, including altruistic sharing, has attracted considerable attention from both academia and the general public (Korndörfer et al., 2015).

As an important subset of prosocial behavior, sharing resources with others represents individuals' willingness to sacrifice personal gain out of concern for others (Ongley & Malti, 2014); it is altruistic when sharing has no external benefit and may even entail a cost to oneself (i.e., performed without the expectation of an external reward, Fehr et al., 2008; Ongley & Malti, 2014). The dictator game (DG) is

Xuran Zhang is co-first author.

✉ Yanfang Li
liyanfang@bnu.edu.cn

[1] Collaborative Innovation Center of Assessment for Basic Education Quality, Beijing Normal University, Beijing, P. R. China

a simple economic paradigm that has been widely used to evaluate altruistic sharing because of its simplicity and uniform procedure (Forsythe et al., 1994). In a typical DG, the proposer (or the 'dictator') is given an amount of money and dictates how much the anonymous recipient will gain, and the recipient does not have the option of rejecting the monetary distribution (Forsythe et al., 1994; Klimecki et al., 2016). Since DG is a one-shot decision situation and the recipient is anonymous, the only motivation the dictator chose to share is altruism rather than the expectation of a materialistic reward (Kogut, 2012). Therefore, the amount that dictators offer represents a measure of altruistic sharing (Edele et al., 2013).

Intuitively, it has often been assumed that people with abundant resources prefer to share their resources with others more than those with fewer resources (Motsenok et al., 2021). However, in the recent psychology research field, researchers have found both OSS and SSS were negatively associated with sharing behavior (e.g., Guinote et al., 2015; James & Sharpe, 2007; Motsenok et al., 2021; Piff et al., 2010) and proposed a classical theory, *social cognitive theory of social class*, to explain the negative association (Kogut 2012). But several studies have questioned this theory and demonstrated some nonnegative patterns (e.g., Korndörfer et al., 2015; von Hermanni et al., 2019), illustrating that the association between social status and altruistic sharing is complex and needs further exploration and validation, especially in countries undergoing rapid economic development and traditionally viewed as interdependent, such as China (Kraus et al., 2012).

In addition, social cognitive theory of social class (Kraus et al., 2012) suggests that the level of social status elicits reliable social cognition, such as empathy, guiding perceptions and understanding of the actions and intentions of others and the social environment. Meanwhile, the empathy-altruism hypothesis (Batson et al., 2015) claims that empathy produces altruistic motivation and is one predictor of prosocial behavior (Morelli et al., 2014). Therefore, it is reasonable to speculate that empathy may have a role in the linkage mechanism between social status and altruistic sharing. However, few studies have considered the role of different aspects of empathy.

Given the above, the present study examines whether social cognitive theory of social class holds in a Chinese sample and explores whether and how different types of empathy bridge the linkage between social status and altruistic sharing. By addressing these issues, the study will help articulate the basic psychological association between objective material discrepancy, subjective perception of social rank and individuals' perception and interaction with others, as well as further help promote altruistic sharing behavior.

## Social status and altruistic sharing

Social status is a multifaceted construct (e.g., Highlander & Jones, 2021; Piff et al., 2010; Savage et al., 2013) that represents both the objective material substance of social life (i.e., income, education, occupation) and an individual's subjective conception of the social status rank of others in society (Adler et al., 1994). These facets of social status have offered a different perspective on how social status associates with the lives and identities of individuals, as well as life outcomes (Piff et al., 2010; Tan et al., 2020).

Recent research has demonstrated that altruistic sharing differences across different social statuses emerge early in human development (4–5 y of age). These studies showed that children from lower social status families tend to share more stickers than their counterparts from upper social status families (Guinote et al., 2015; Miller et al., 2015). In addition, the same finding was also observed in adults. Piff and his colleagues (2010) found that individuals with lower social status might be more likely to prioritize the interests of others over their own to adapt to the adverse environment and show much more prosocial behavior than their upper social status counterparts. Moreover, in addition to long-term "real" poverty, even a temporary perception of social rank can alter one's prosociality (Piff et al., 2010; Piff & Robinson, 2017). For example, in a recent study, Motsenok and Ritov (2021) found that, when social status was momentarily activated, participants of lower perceived social position were significantly more willing to donate money than those of relatively high perceived social status.

Except for empirical studies, researchers offer unique theoretical perspectives on the inner psychological mechanism to illustrate the linkage between different social statuses and individuals' prosocial behavior. One of the most dominant conceptual frameworks is the social cognitive theory of social class proposed by Kraus et al. (2012). The core view of this theory is that different social statuses elicit different social cognitive patterns in individuals. Specifically, individuals with low social status are characterized by contextualist social-cognitive tendencies, which are an external orientation to the environment and are motivated by "managing external constraints, outside threats, and other individuals", while individuals from high social status are characterized by solipsistic social-cognitive tendencies, which are an individualistic orientation to the environment and motivated by "internal states, goals, and emotions". Thus, fewer resources are available for low social status individuals, which directly influences stability in their daily life and work and finally leads low social status individuals to be more external-oriented and more other-focused, as well as to act much more prosocially to adapt to the environment (Piff & Robinson, 2017).

Although previous studies offer convincing evidence and theoretical support for the negative relationship between social status and sharing, several studies have questioned the validity of the negative relation according to social cognitive theory of social class (Korndörfer et al., 2015; Liu & Hao, 2017; Stamos et al., 2020; Van Doesum et al., 2017; von Hermanni et al., 2019). For example, Stamos et al. (2020) planned two direct replications of the studies of Piff et al. (2010) but did not find a substantial link between social status and sharing. Korndörfer and his colleagues (2015) found positive effects of social status on sharing based on several large and representative international samples: Higher OSS and SSS individuals were more likely to make charitable donations. Given this information, there is a need to test the validity of social cognitive theory of social class.

## Objective and subjective assessments of social status

Social status is broadly measured by two metrics: the objective levels of material resources (OSS, or objective socioeconomic status SES) and individuals' perceptions of social standing compared with others in society (SSS). OSS is typically assessed in three indices: individual financial wealth, education, and occupational prestige. Among them, income and education were two commonly used indicators of OSS in prior studies (e.g., Kraus et al., 2009; Van Doesum et al., 2017). On the other hand, SSS defines social status based on individuals' perception of their position within a society, which is commonly measured by the single-item MacArthur Scale of Subjective Social Status (Adler et al., 1994). Although social status is measured through OSS and SSS, only a weak or moderate correlation (range from 0.30 to 0.60) is expressed in these two indicators (Tan et al., 2020). This finding implied that these two social status assessment indicators are relatively independent and that individuals with more material resources may not necessarily perceive that they occupy higher social status ranks relative to others in society (Kraus et al., 2012). Therefore, these different measures of social status may be linked to related outcomes by different patterns (Korndörfer et al., 2015). As the report of APA's task force on SES indicated (American Psychological Association, 2007), "it is generally more informative to assess the different dimensions of SES and understand how each contributes to an outcome under study rather than merge the measures (Page 11)."

Although most related studies found that OSS and SSS converge in their influence on prosociality, some studies have suggested inconsistent results. For example, in one study (see Van Doesum et al., 2017, Study 2), the relation between reports of income and prosociality was not significant, while the social status ladder was positively significantly related to volunteering. Hence, to provide empirical evidence to resolve this debate, we follow previous researchers' strategies of employing social status by multiple indicators, including both OSS (e.g., income and education) and SSS (e.g., wealth, power, and prestige). These multiple and different measures of social status help examine how different facets of social status link to altruistic sharing in unique ways and distinguish the findings above.

Importantly, like OSS, SSS can also be seen as a composite index, which is not simply explained by the economic rank-related process but also reflects power and prestige. However, the SSS is sometimes referred to as subjective SES, which measures an individual's SSS using socioeconomic indicators such as income (Highlander & Jones, 2021). According to Kraus et al. (2012), SSS characteristics are rank-related, which are not simply explained by subjective SES. There are another two rank-related processes—social power and social prestige. Social power refers to one's relative control over resources and ability to administer punishments (Fiske, 2010; Keltner et al., 2003; Magee & Galinsky, 2008). Social prestige is defined as the respect and admiration one enjoys in the eyes of members of social groups (Anderson et al., 2012; Maner, 2017) argued that SSS could not be simplified to one dimension. Researchers collected a national online sample of adults and examined their OSS (income and education), subjective SES, and sense of power and prestige. The results showed that these important indicators were relatively independent, which implied that the study results of the relation between social status and prosocial behavior would be limited if only one or part of the components of SSS were taken into consideration. However, few previous studies have considered the three indicators of SSS simultaneously, and only a few studies have examined whether the position of power or prestige an individual occupies in the social hierarchy influences sharing. For example, Guinote et al. (2015) found that when individuals' perception of social status—defined as the prestige, reputation, and esteem that individuals hold in the eye of others—was temporarily manipulated, individuals who experienced low status showed more prosocial behavior. Therefore, despite the acknowledged importance of social power and prestige for sharing, whether they are associated with altruistic sharing independently or differently remains largely unknown. Here, we adapted the MacArthur Scale of Subjective Social Status and adopted a more holistic approach to understanding the respective role of the three SSS indicators on sharing.

Taken together, guided by the relevant evidence and theory above, the present study's overarching aim is to examine the relation between social status, both OSS and SSS, and altruistic sharing as well as validate the social cognitive theory of social class in China.

## Empathy as an underlying pathway

Empathy is defined as the ability to understand others' perspectives and experience affective reactions to others' emotional states (Eisenberg et al., 2002); this ability is one of the fundamental aspects of social competence and a major motivating force driving prosocial behavior (e.g., Batson et al., 1981; Batson et al., 1997). To our knowledge, whether empathy can mediate the relation between SES and sharing remains unknown because no study has as yet addressed this issue. Nevertheless, some theories and studies have independently examined the relation between social status and empathy, as well as the association between empathy and altruistic sharing.

Guided by the social cognitive theory of social class framework (Kraus et al., 2012; Piff et al., 2010), people with lower social status suffer from fewer resources and lower social rank, which results in contextualist tendencies that focus more on the external environment and other individuals, leading to greater empathy. In contrast, individuals with higher social status have abundant resources and greater social rank, giving rise to solipsistic tendencies, which are more individualistic, focusing on their internal states, goals, and emotions. Thus, social cognitive theory of social class hypothesizes that individuals of higher social status may be less empathetic. In one study, individuals with low social status could better identify the emotional states of others than those with high social status (Piff et al., 2010). However, some other researchers hold the view that people of higher social status tend to process information in a more integral way, which is beneficial for them to accurately understand others' feelings; furthermore, more powerful people usually experience more positive emotions, which makes them more likely to understand others' perspectives and share their feelings (Mast et al., 2020).

According to the empathy-altruism hypothesis (Batson et al., 2015), empathy helps elicit altruistic motivation with the purpose of contributing to the welfare of others. Numerous studies have established a link between altruism and empathy (see review Eisenberg et al., 2010). For example, Klimecki et al. (2016) found that an increase in experienced empathy predicted an increase in altruistic sharing. Edele et al. (2013) also showed a positive relation between empathic traits and altruistic sharing. Other studies have also found a significant association between empathy and sharing behavior (Farrelly et al., 2015; Gummerum & Hanoch, 2012), which confirms the empathy-altruism hypothesis (Batson et al., 2015). Taken together, the related theories and empirical evidence support a basis for empathy serving a mediating role between social status and altruistic sharing.

However, there are still some debates about the above findings. In prior studies, psychologists proposed that empathy encompasses cognitive empathy and affective empathy (Blair, 2005; Smith, 2006). Cognitive empathy is defined as one's tendency to understand another person's mental state (Blair, 2005; Smith, 2006). Affective empathy indicates an individual's emotional response to others' emotions (Deutsch & Madle, 1975), which incorporates affective empathy for positive emotions (i.e., positive empathy) and negative emotions (i.e., negative empathy) (Morelli et al., 2015; Yue et al., 2016). Previous studies have focused on the association with negative emotions but have ignored positive emotions (Andreychik & Lewis, 2017). However, Andreychik and Migliaccio (2015) examined the potential separability of positive and negative empathy and demonstrated that each has different influences on prosocial behavior. Other studies showed that affective empathy, rather than cognitive empathy, significantly predicts people's altruistic sharing behavior (Artinger et al., 2014; Edele et al., 2013; Gummerum & Hanoch, 2012), while in a Chinese cultural context, cognitive rather than affective empathy works in predicting adults' altruistic sharing (Li et al., 2019). Therefore, what is not known is whether cognitive empathy instead of affective empathy bridge the linkage between social status and altruistic sharing in China, and whether positive and negative empathy bridge the relation between social status and altruistic sharing differently.

Collectively, another goal in this study is to examine the mediating role of different empathy compositions in the relation between social status and altruistic sharing; specifically, we took positive, negative, and cognitive empathy into consideration simultaneously and compared the different mediators.

## Current study

In summary, we adopt a more holistic approach to investigate the relation of social status with sharing and the role of different components of empathy in the connection based on social cognitive theory of social class and the empathy-altruism hypothesis (see Fig. 1 for a conceptual model). Here, we sought to extend previous research by testing the model in China.

China has a unique social environment and cultural background. On the one hand, it is generally agreed that Chinese culture is characterized by collectivism and influenced deeply by Confucian culture (Zhang & Han, 2021). This Chinese value system highlights the maintenance of group wellbeing and interdependent social relationships and networks (Chen & Lei, 2012; Zhao et al., 2019). Different from the Western value system, individual behavior is closely linked to social responsibility for the group and relative status within the social hierarchy in the Chinese value system (Chen & Lei, 2012). For example, within Chinese

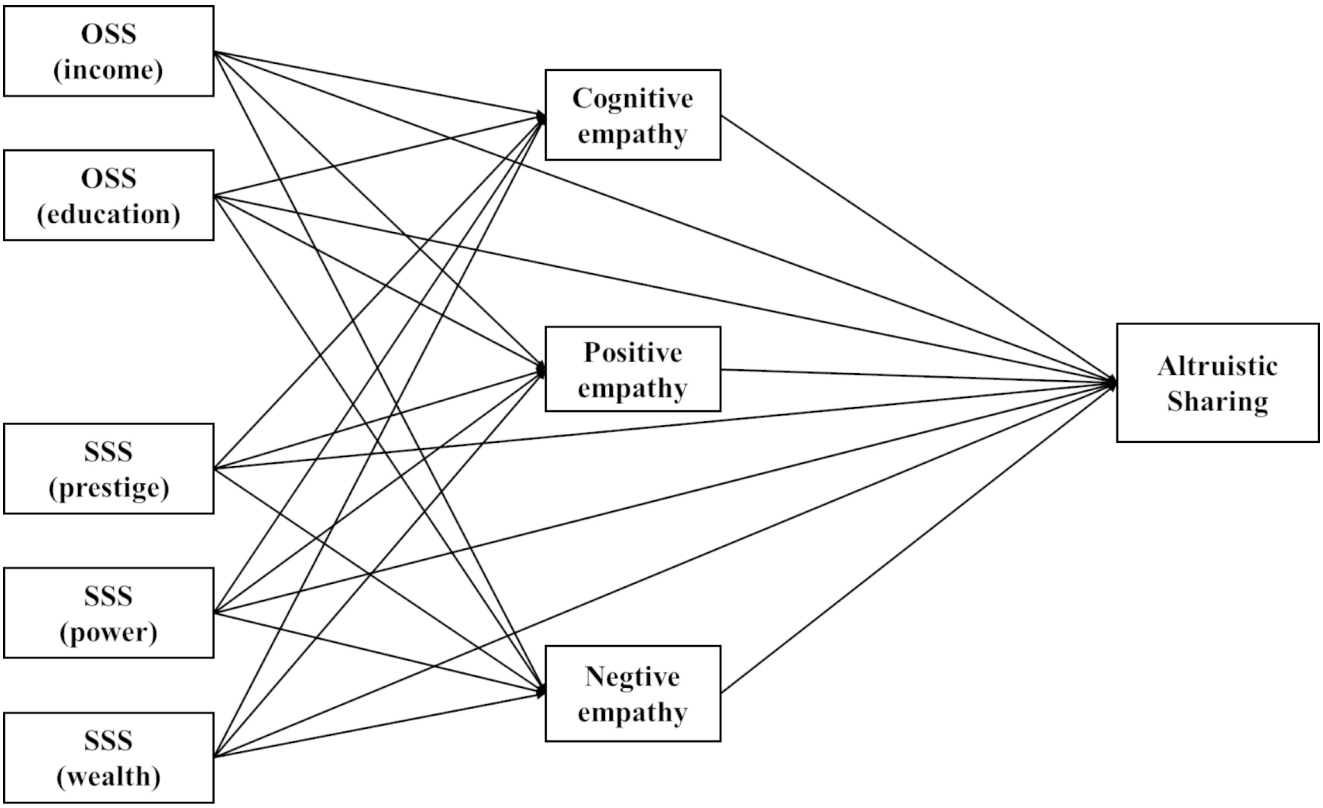


**Fig. 1** Conceptual model

Confucian culture, a balanced society requires individuals of a high rank within the social hierarchy (i.e., power) to restrain their own desires and attend to the needs and welfare of others (Zhong et al., 2006). However, on the other hand, China's economy has sustained high-speed and astonishing growth through the implementation of the reform and opening policy and the victory in the fight against poverty. According to Kraus et al. (2012) this economic advancement in an interdependent culture may lead to an increase in solipsistic social cognitive pattern, which goes against the traditional value system. Therefore, based on social cognitive theory of social class, we hypothesize that OSS and SSS are negatively associated with sharing behavior.

In addition, according to social cognitive theory of social class and the empathy-altruism hypothesis, there is evidence that social status is associated with empathy (Mast et al., 2020; Piff et al., 2010) and that empathy is closely related to altruistic sharing (Edele et al., 2013; Farrelly et al., 2015; Gummerum & Hanoch, 2012; Klimecki et al., 2016). Thus, we proposed that empathy mediates the link between social status and sharing behavior. At the same time, considering the different patterns of relation between empathy and altruism in different cultures, cognitive empathy rather than affective empathy was a predictor of altruistic sharing in China (Li et al., 2019). We hypothesize that cognitive empathy plays a more important role in the mediation effect between social status and sharing.

## Materials and methods

### Participants

Convenience sampling was used to recruit participants. A total of 2,200 Chinese adults from two provinces (Beijing and Shandong) were initially recruited, and 1,712 of them (63% females; age 30–58; $M_{age}$ = 38.54 years, $SD$ = 4.16) completed the survey. The rest of the participants were excluded from the data analysis because they did not complete the question as requested (the sum of the amount they kept and transferred to an anonymous recipient was not equal to the amount they were given in the DG game, or they selected the same choice in all questions of the empathy test).

### Procedure

All participants completed the questionnaire through the survey link posted on web survey platforms. The informed consent form was shown on the front page of the online

questionnaire, in which participants were told they were taking part in the project voluntarily, and they were allowed to refuse to complete the survey or to submit it at any time. The participants could complete and submit the questionnaire in their free time within one week. The recruitment and data collection procedures in this study were approved by Beijing Normal University's institutional review board.

## Measures

### OSS

OSS was measured based on the two most commonly used indicators, education and total income in the previous year (Kraus et al., 2009). Education refers to the highest level of educational attainment, which was categorized into eight groups (1 = *lower than elementary school*, 2 = *elementary school*, 3= *middle school*, 4 = *high school*, 5 = *junior college*, 6 = *bachelor's degree*, 7 = *master's degree*, 8 = *doctor's degree and above*). Income was assessed by an open-ended question that asked participants to indicate their family's total income (in ten thousand Chinese yuan) in the past year. Income was log-transformed because it was severely positively skewed, and then education and log-transformed income were standardized for subsequent data analysis (Li et al., 2020).

### SSS

The tool for measuring subjective SES was adapted from the MacArthur Scale of Subjective Social Status (Adler et al., 1994). Specifically, the single expression of "social status" in the original measurement was split into three different components of social status: wealth, power, and prestige. The scale consists of three 10-rung ladders representing subjective wealth/power/prestige status. Participants were presented with these ladders and given the following explanation:

*The ladder indicates the level of wealth/power/prestige an individual has in Chinese society. The bottom of the ladder represents the least wealthy/powerful/prestigious people. The top of the ladder represents people who are the wealthiest/most powerful/most prestigious.*

Then, participants were asked to indicate their position on the ladder (1 = *the lowest*, 10 = *the highest*). These three scores were standardized separately and used as independent continuous variables in the data analysis.

### Empathy

Although empathy was regarded as a multidimensional construct, no tool was created to comprehensively measure the three dimensions of empathy. Therefore, this study adapted the measurement of empathy from two authoritative tools: the Chinese version of the Questionnaire of Cognitive and Affective Empathy (QCAE, Liang et al., 2019; Reniers et al., 2009) and the Chinese version of the Positive Empathy Scale (PES, Morelli et al., 2015; Yue et al., 2016). Both scales have excellent reliability and validity values in the Chinese population (e.g., Liang et al., 2019; Yue et al., 2016). By adaptation, this study developed an empathy scale consisting of three dimensions: (a) cognitive empathy (11 items, e.g., Before I do something, I try to consider how my friends will react to it; $\alpha = 0.91$); (b) positive empathy (7 items, e.g., I typically feel happy when others around me are smiling; $\alpha = 0.91$); and (c) negative empathy (5 items, e.g., I get very upset when I see someone cry; $\alpha = 0.80$). Each item is rated on a 4-point scale (ranging from 1 = *very much unlike me* to 4 = *very much like me*). Higher scores indicate higher levels of empathy. The result of confirmatory factor analysis (CFA) showed good structural validity: $\chi^2(227) = 2398.092$, CFI = 0.89, RMSEA = 0.06.

### Altruistic Sharing

A single-trail anonymous DG was used to evaluate the participants' altruistic sharing (Forsythe et al., 1994; Kuang et al., 2021), which read as follows:

*Imagine that you have ¥100. Now you have the right to decide how much you want to keep for yourself and how much (if any) you want to transfer to another anonymous stranger: you will keep ¥_____; you will share ¥_____ to the stranger.*

The amount participants choose to give to an anonymous stranger (ranging from 0 to 100) represents their willingness to share.

## Data analyses

We first examined normality and outliers before data analyses. All variables met the normality standard (skewness < 2, kurtosis < 7; West et al., 1995). No outliers were identified. Correlation analysis and the variance inflation factor (VIF) were used to avoid problems with multicollinearity. We used SPSS 23.0 to perform the preliminary analyses. The following path analysis models were performed using Mplus 7.4 to examine the relations between social status, empathy and altruistic sharing. In addition, the mediating role of empathy in the relation between social status and altruistic sharing was tested using the bootstrapping confidence interval (CI) method with 1,000 bootstrap samples. Finally, the False Discovery Rate method (FDR; Benjamini & Hochberg, 1995) was applied to reduce Type I error as a result of multiple testing in the path analysis process.

**Table 1** Descriptive statistics and bivariate correlations of the main variables ($N = 1{,}712$)

| Variables | *M* | *SD* | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|
| **OSS** | | | | | | | | | | |
| 1. OSS (education) | 5.07 | 1.24 | | | | | | | | |
| 2. OSS (income) | 21.77 | 22.25 | 0.58*** | | | | | | | |
| **SSS** | | | | | | | | | | |
| 3. SSS (wealth) | 4.75 | 1.64 | 0.19*** | 0.34*** | | | | | | |
| 4. SSS (power) | 3.68 | 2.01 | 0.04 | 0.16*** | 0.59*** | | | | | |
| 5. SSS (prestige) | 4.52 | 2.11 | −0.03 | 0.00 | 0.49*** | 0.63*** | | | | |
| **Empathy** | | | | | | | | | | |
| 6. Cognitive empathy | 2.99 | 0.48 | 0.12*** | 0.14*** | 0.14*** | 0.13*** | 0.13*** | | | |
| 7. Positive empathy | 3.44 | 0.50 | 0.03 | 0.01 | 0.02 | 0.01 | 0.05* | 0.41*** | | |
| 8. Negative empathy | 2.86 | 0.52 | −0.15*** | −0.12*** | −0.12*** | −0.10*** | 0.03 | 0.26*** | 0.34*** | |
| **Altruistic sharing** | | | | | | | | | | |
| 9. Altruistic sharing | 18.95 | 18.56 | −0.15*** | −0.10*** | 0.05* | 0.10*** | 0.10*** | 0.09*** | 0.08*** | 0.13*** |

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

**Table 2** Association between OSS, SSS, empathy, and altruistic sharing

| | Model 1 | | | | Model 2 | | | |
|---|---|---|---|---|---|---|---|---|
| | *β* | *b* | *SE* | *FDR-corrected p value* | *β* | *b* | *SE* | *FDR-corrected p value* |
| **Covariates** | | | | | | | | |
| Gender (1 = male) | -0.005 | -0.209 | 0.922 | 0.821 | 0.003 | 0.109 | 0.934 | 0.947 |
| Age | 0.008 | 0.035 | 0.115 | 0.821 | 0.011 | 0.048 | 0.113 | 0.819 |
| Region (1 = Beijing) | 0.054 | 2.068 | 1.355 | 0.339 | 0.039 | 1.471 | 1.347 | 0.504 |
| **OSS** | | | | | | | | |
| OSS (education) | -0.119 | -2.213 | 0.566 | < 0.001 | -0.123 | -2.283 | 0.563 | < 0.001 |
| OSS (income) | -0.020 | -0.378 | 0.627 | 0.765 | -0.031 | -0.579 | 0.623 | 0.553 |
| **SSS** | | | | | | | | |
| SSS (wealth) | 0.030 | 0.577 | 0.587 | 0.652 | 0.039 | 0.719 | 0.584 | 0.480 |
| SSS (power) | 0.079 | 1.473 | 0.634 | 0.080 | 0.083 | 1.530 | 0.629 | 0.049 |
| SSS (prestige) | 0.019 | 0.357 | 0.635 | 0.765 | 0.002 | 0.042 | 0.631 | 0.947 |
| **Empathy** | | | | | | | | |
| Cognitive Empathy | | | | | 0.064 | 2.457 | 1.036 | 0.049 |
| Negative Empathy | | | | | 0.093 | 3.277 | 0.928 | < 0.001 |
| Positive Empathy | | | | | 0.022 | 0.829 | 1.027 | 0.576 |

Note: *b* represents unstandardized coefficients, *β* represents standardized coefficients, and *SE* represents standard error

# Results

## Preliminary analyses

Table 1 shows descriptive statistics and bivariate correlations between the main variable measures in this study. All correlation coefficients were below 0.70, indicating an acceptable level of multicollinearity (Dormann et al., 2013). The results showed that altruistic sharing was negatively correlated with participants' education ($r$ = -0.15, $p < 0.001$) and income ($r$ = -0.10, $p < 0.001$). Additionally, subjective wealth ($r = 0.05$, $p < 0.05$), power ($r = 0.10$, $p < 0.001$), and prestige ($r = 0.10$, $p < 0.001$) status and three dimensions of empathy ($r = 0.08 \sim 0.13$, $ps < 0.001$) were positively correlated with altruistic sharing. For empathy, five social status factors were significantly positively ($r = 0.12 \sim 0.14$, $ps < 0.001$) correlated with cognitive empathy but were significantly negatively correlated with negative empathy ($r$ = -0.15 ~ -0.10, $ps < 0.001$), except for subjective prestige status ($r = 0.03$, $p > 0.05$). In addition, there were no obvious relation between social status and positive empathy.

## The association between social status and altruistic sharing

We constructed two path analysis models to test the relation between social status, empathy and altruistic sharing (see Table 2). All five categories of social status were simultaneously entered into Model 1 to examine the direct association between social status and altruistic sharing. Then in Model 2, we included all constructs of social status and empathy at once to examine the direct linkage of social status and empathy with sharing behavior. All the models were controlled for gender, age, and region. For social status, the results of

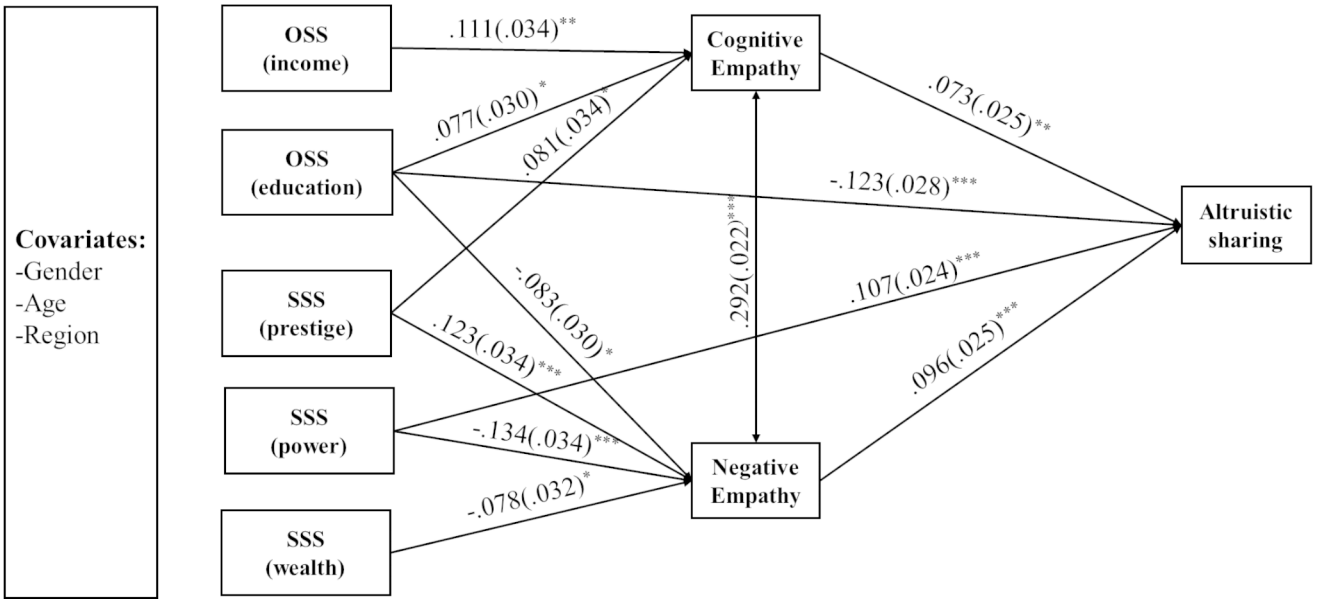


**Fig. 2** The mediation effect of empathy between social status and altruistic sharing. Only significant paths are displayed. The values on the lines represent standardized coefficients. The covariates were gender, age, and region. *$p<0.05$, **$p<0.01$, ***$p<0.001$; $p$ is adjusted for multiple comparisons using the False Discovery Rated (*FDR*)

Model 1 showed that higher education was associated with lower altruistic sharing ($\beta=-0.119$, $SE=0.566$, $p<0.001$), and subjective power status was marginally positively associated with altruistic sharing behavior ($\beta=0.079$, $SE=0.634$, $p=0.08$). For empathy, the results of Model 2 showed that higher cognitive empathy ($\beta=0.064$, $SE=1.036$, $p<0.05$) and negative empathy ($\beta=0.093$, $SE=0.928$, $p<0.001$) were associated with greater altruistic sharing behavior. In addition, we also used VIF to check multicollinearity, and all models met the most recommended acceptable guidelines of non-multicollinearity with VIF less than 10 (O'brien, 2007).

### The mediation effect of empathy between social status and altruistic sharing

To explore whether different constructs of social status were indirectly linked to altruistic sharing through empathy, we conducted Model 3 which includes five social status factors simultaneously. Figure 2 shows the path analysis results, and the model fit was satisfied, $\chi^2(3)=2.012$, CFI = 1.000, TLI = 1.022, SRMR = 0.004. The results showed that only income was indirectly linked to altruistic sharing through cognitive empathy. Specifically, higher levels of income ($\beta=0.111$, $SE=0.034$, $p<0.01$) were related to greater cognitive empathy, which, in turn, had a positive association with altruistic sharing (indirect effect = 0.151, $p<0.05$, 95% CI [0.016, 0.286]).

Additionally, education and three kinds of SSS were indirectly linked to altruistic sharing through negative empathy. Specifically, higher subjective prestige status ($\beta=0.123$, $SE=0.034$, $p<0.001$) was associated with higher negative empathy, which, in turn, was associated with higher altruistic sharing (indirect effect = 0.219, $p<0.01$, 95% CI [0.055, 0.383]). However, higher education ($\beta=-0.083$, $SE=0.030$, $p<0.05$), subjective power status ($\beta=-0.134$, $SE=0.034$, $p<0.001$) and subjective wealth status ($\beta=-0.078$, $SE=0.032$, $p<0.05$) were related to lower negative empathy, which, in turn, was related to higher altruistic sharing (indirect effect = -0.148, -0.248 and −0.140, $ps<0.05$, 95% CI [-0.279, -0.017], [-0.411, -0.068] and [-0.272, -0.008]).

## Discussion

The present study examined the relation between social status and altruistic sharing and the mediation of empathy. The results partly confirmed social cognitive theory of social class. Specifically, objective education was significantly negatively linked to altruistic sharing, while subjective power status was positively linked. In addition, there were several indirect pathways in the linkage between social status and altruistic sharing.

### Different effects of OSS and SSS on altruistic sharing

In this study, we comprehensively considered various components of social status and compared the relation between each component and altruistic sharing. The results of this study partially support our hypotheses. Specifically, two

indicators of OSS were negatively correlated with altruistic sharing, whereas three factors of SSS were positively associated with altruistic sharing. Moreover, when we took different constructs of social status into account simultaneously to obtain the independent effect of each one, we only found some OSS (i.e., education) or SSS (i.e., subjective power status) components were linked to altruistic sharing. It seems that education and subjective power status played dominant roles.

The results revealed significantly different linkages between OSS and SSS to altruistic sharing and partly supported the social cognitive theory of social class that social status was negatively correlated with sharing behavior when objective indicators measured social status. According to social cognitive theory of social class, individuals with lower social status usually have fewer economic and educational resources, which constrains their behavior and opportunities and shapes their contextualist social-cognitive tendencies; thus, lower social status individuals have to rely on others and, thus, become more sensitive to the needs of others.

In addition, the results showed that the three indicators of SSS were all positively correlated with sharing behavior, in contrast the expectations of social cognitive theory of social class, this is worth noting. Most previous studies have not found controversial effects between the relation of OSS and SSS on altruistic sharing; neither have they problematized whether the roles of both OSS and SSS in prosociality are consistent (Korndörfer et al., 2015; Kraus et al., 2012; Piff et al., 2010, 2012). However, our participants were from China, which is undergoing an unprecedented drastic and accelerated pace of social transition. Therefore, one's social ladder could have been greatly changed or made more complex during such rapid social stratification and urbanization, and it may be difficult for individuals to accurately locate themselves on the social ladder, presenting inconsistent results between subjective and objective social status as well as their sharing behavior (Chen & Fan, 2015).

What also surprised us was that education seems to play a more dominant role in sharing than income (see Table 2). This implied that education might have a predominant and unique association with altruistic sharing. Prior researchers have proposed that OSS is a compound conception and includes material (i.e., income) and nonmaterial (i.e., education) resources (Farah, 2017; Rakesh et al., 2021). These two factors have different effects on psychological outcomes and neural structure (Noble et al., 2012, 2015; Rakesh et al., 2021). In particular, education represented a kind of human capital, including the skills acquired formally or informally that are helpful in the labor market or at home (Duncan & Magnuson, 2012). According to human capital theory (Becker, 1964), education drives the marginal productivity of labor, which in turn drives earnings. Therefore, lower-income individuals may experience fewer material resources, but individuals with less education may not only have less human capital but also lower salary levels (Zhao, 2008). Therefore, education as a kind of human capital that may be more strongly linked to individuals' cognitive and behavioral patterns. In addition, education is a good method to transmit cognitive tendencies and can nurture systems of behavior (Grossmann & Varnum, 2010). A series of studies confirmed that a high level of education could help shape an independent psychological process, and a low level of education nurtures an interdependent and contextual psychological process (Hamamura et al., 2013; Snibbe & Markus, 2005; Stephens et al., 2011, Study 1). For example, a cross-cultural study (Grossmann & Varnum, 2011) found that people with lower education backgrounds exhibited more contextual cognition and more interdependent self-views in both independent societies (e.g., the U.S.) and interdependent societies (e.g., Russia), which may be conducive to shaping prosocial behavior (Piff et al., 2010).

Another interesting result was that only subjective power status was directly positively linked to altruistic sharing when subjective indicators measured social status. Although most studies on Western culture hold the view that power may lead to some negative outcomes, such as self-interest and less sharing behavior (Galinsky et al., 2003; Goodwin et al., 2000), studies in Eastern culture tend to present another understanding of power, which conceptualizes power as "responsibility" instead of "influence" (Zhong et al., 2006). According to Torelli et al. (2020), culture affects how power is conceptualized and what its consequences are. In the West, power is conceptualized as personalized, and high levels of power promote actions to benefit the self over others. In contrast, in East Asia, power is conceptualized as socialized, and high levels of power promote actions intended to benefit others (Torelli et al., 2020). Therefore, in Chinese culture, subjective power status may play a more important and dominant role because it is conceptualized as socialized and leads to a different result: people with higher subjective power status are more likely to share their resources with others to benefit others.

## The mediation of different types of empathy

As we expected, empathy indeed plays a mediator role in the relation between social status and altruistic sharing. However, we found that only cognitive empathy and negative empathy acted as mediators, and no mediation effect of positive empathy. First, the results showed that cognitive empathy only mediated the relation between income and sharing behavior, and the other social status factors were linked with altruistic sharing through negative empathy. This implied

that negative empathy might play a more important role in the relationship between social status and altruistic sharing. This idea is not as expected but is in line with the traditional argument from the philosopher David Hume that judgments are based on sentiment and immediate feelings, not reasoning (Edele et al., 2013), and the social intuitionist model from Haidt (2007) that moral judgment is often based on strong, quick and unconscious emotion but not deliberate reasoning. This seems to show that the negative emotional response tendency toward others instead of understanding others' perspectives might account for the relation between social status and altruistic sharing. However, we should not neglect that cognitive empathy also mediates the relation between income and altruistic sharing. Considering that culture is deemed to have an important impact on empathy (Zhao et al., 2019, 2021), we speculate that the possible reason to explain the mediation effect of cognitive empathy may be culture. For example, in some comparative studies, Eastern adults had a higher level of cognitive empathy but a lower level of affective empathy than Western adults (Atkins et al., 2016; Birkett, 2014; Cassels et al., 2010), which may lead to different patterns of mediation effects in different cultures. Meanwhile, Li et al. (2019) found that cognitive empathy rather than affective empathy was a significant predictor of Chinese adults' altruistic sharing behavior. However, it is noteworthy that the current studies regarding the cultural impact on empathy are inconsistent. For instance, Melchers et al. (2015, 2016) did not find different cultural patterns concerning empathy, which implied that cultural differences might not fully explain the results of this study. Therefore, this finding emphasizes the necessity to verify the mediation effects of different empathy structures in the study of the relation between social status and altruistic sharing, particularly in cross-cultural populations.

Second, people with higher levels of education, subjective power, or wealth status were associated with lower negative empathy, which was related to less prosocial behavior. These findings are in accordance with the social cognitive model of social class; individuals with higher social status have decreased contextualist tendencies, show less empathy and share fewer amounts than individuals with lower social status (Kraus et al., 2012). Moreover, what we are interested in is that there was a positive direct relation between subjective power status and sharing behavior that is contrary to the social cognitive model; however, the indirect pathway is the reverse and also fits this theory. This finding leads to an interesting discussion and may provide evidence for the claim that economic advancement in collectivistic cultures may increase egoistic social cognitive patterns. Traditional cultural values that regard power as "responsibility" call for powerful people to share more resources with others (Torelli et al., 2020; Zhong et al., 2006). As social cognition patterns change due to economic growth, individuals with greater power act more selfishly (Kraus et al., 2012) and show a lower level of negative empathy for others, demonstrating less prosociality.

Understanding the relation between social status and altruistic sharing as well as the underlying cognition mechanism may have implications for fields such as politics, economics and education, involving people of different socioeconomic statuses, especially in China and countries with similar socioeconomic and cultural profiles. For instance, it is beneficial for some charitable organizations to maximize support and return under the guidance of this study. School curricula might be modified or interventions could be designed to develop students' empathic tendencies and skills as well as increase the level of prosociality. In addition, our study contributes somewhat to a breakdown of stereotypes and social class bias, which is conducive to developing policies to reduce increasing social tensions (Ragusa, 2015) and alter preferences for redistributions (Durante et al., 2017).

## Limitations and future directions

There are some limitations in the present research.

First, the current study relied only on a single-trail measure of the DG as an indicator of altruistic sharing, while the correlation between real-life donations and the amount the participants offered in the DG is quite weak (Barraza et al., 2011; Baumert et al., 2014). Therefore, in the future, it would be beneficial to collect more indicators of sharing to yield conclusive results.

Second, as with the prior study using the DG paradigm, the information about the recipient is unavailable. According to Kuang et al. (2021), the social identities of the targets toward whom prosocial behavior is directed is an important reason for the inconsistent conclusion in previous studies. Therefore, ecological validity will be higher if future studies address this limitation.

A third limitation is that generalizing the results to other prosocial behavior requires some caution. Actually, prosociality is a complex concept and covers a variety of actions that are aimed at benefitting others, such as helping and cooperating (Penner et al., 2005). We assessed altruistic sharing in the present study, and future research should explore other prosociality forms.

Finally, some effects in this study (e.g., the associations between SSS and altruistic sharing) were small. Thus, we must be careful not to overstate our conclusion. Meanwhile, the small effects implicated a signal for a potential variable. For example, according to Callan et al. (2017), subjective SES was negatively associated with prosociality only when personal relative deprivation (PRD) was incorporated into

the model. Therefore, in the future, exploring additional factors would be beneficial for robust conclusions.

## Conclusion

The present study investigated the direct linkages between social status and altruistic sharing and the mediation of empathy on the linkage based on social cognitive theory of social class and the empathy-altruism hypothesis in China. The results showed that the indicators of OSS were negatively related to altruistic sharing and the factors of SSS were positively correlated with altruistic sharing. However, only education and subjective power status were directly linked to altruistic sharing when we take different factors of social status into account simultaneously. Meanwhile, there were several indirect pathways were found in the linkage between social status and altruistic sharing. Income and subjective prestige status were found to be indirectly linked to altruistic sharing through cognitive empathy, and education and SSS were found to be indirectly linked to altruistic sharing through negative empathy. These findings implied that various components of OSS and SSS might be linked to altruistic sharing in different patterns in China, and the inner mechanisms through negative or cognitive empathy may also be different. These results examined and supplied the existing social cognitive theory of social class and insights into a specific culture to help us understand the relation between social status and altruistic sharing in the context of the rapid economic development of an interdependent culture.

**Acknowledgements** This study was supported by the National Natural Science Foundation of China (31900774, 32171062) and Beijing Municipal Social Science Foundation of China (19JYB013).

**Authors' Contributions** All authors contributed significantly to the study and approved the final version of the manuscript. **Bingying Wei**: Data curation, Software, Formal analysis, Writing - original draft, Writing - review & editing. **Xuran Zhang**: Conceptualization, Investigation, Methodology, Visualization, Formal analysis, Writing - review & editing. **Dan Cui**: Software, Formal analysis, Writing - review & editing. **Yanfang Li**: Funding acquisition, Project administration, Supervision, Writing - review & editing.

**Data availability** The data that support the findings of this study are available on reasonable request from the corresponding author. The data are not publicly available due to them containing information that could compromise the consent of research participants.

## Declarations

**Ethical approval** All procedures followed approved by Beijing Normal University's institutional review board.

**Informed consent** Informed consent/assent was obtained from all study participants.

**Conflict of interest** The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

## References

Adler, N. E., Boyce, T., Chesney, M. A., Cohen, S., Folkman, S., Kahn, R. L., & Syme, S. L. (1994). Socioeconomic status and health: the challenge of the gradient. *American Psychologist*, *49*(1), 15–24. https://doi.org/10.1037/0003-066x.49.1.15

American Psychological Association, T. F. O. S. (2007). *Report of the APA Task Force On Socioeconomic Status*. Washington, DC: American Psychological Association.

Anderson, C., Kraus, M. W., Galinsky, A. D., & Keltner, D. (2012). The Local-Ladder Effect: Social Status and Subjective Well-Being. *Psychological Science*, *23*(7), 764–771. https://doi.org/10.1177/0956797611434537

Andreychik, M. R., & Lewis, E. (2017). Will you help me to suffer less? How about to feel more joy? Positive and negative empathy are associated with different other-oriented motivations. *Personality and Individual Differences*, *105*, 139–149. https://doi.org/10.1016/j.paid.2016.09.038

Andreychik, M. R., & Migliaccio, N. (2015). Empathizing With Others' Pain Versus Empathizing With Others' Joy: Examining the Separability of Positive and Negative Empathy and Their Relation to Different Types of Social Behaviors and Social Emotions. *Basic and Applied Social Psychology*, *37*(5), 274–291. https://doi.org/10.1080/01973533.2015.1071256

Artinger, F., Exadaktylos, F., Koppel, H., & Sääksvuori, L. (2014). In Others' Shoes: Do Individual Differences in Empathy and Theory of Mind Shape Social Preferences? *PLoS One*, *9*(4), e92844. https://doi.org/10.1371/journal.pone.0092844

Atkins, D., Uskul, A. K., & Cooper, N. R. (2016). Culture shapes empathic responses to physical and social pain. *Emotion*, *16*(5), 587–601. https://doi.org/10.1037/emo0000162

Barraza, J. A., McCullough, M. E., Ahmadi, S., & Zak, P. J. (2011). Oxytocin infusion increases charitable donations regardless of monetary resources. *Hormones and Behavior*, *60*(2), 148–151. https://doi.org/10.1016/j.yhbeh.2011.04.008

Batson, C. D., Duncan, B. D., Ackerman, P., Buckley, T., & Birch, K. (1981). Is empathic emotion a source of altruistic motivation? *Journal of Personality and Social Pshcology*, *40*(2), 290–302. https://doi.org/10.1037/0022-3514.40.2.290

Batson, C. D., Lishner, D. A., & Stocks, E. L. (2015). The Empathy-Altruism Hypothesis. In D. A. Schroeder, & W. G. Graziano (Eds.), *The Oxford Handbook of Prosocial Behavior* (pp. 259–281). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780195399813.013.023

Batson, C. D., Sager, K., Garst, E., Kang, M., Rubchinsky, K., & Dawson, K. (1997). Is empathy-induced helping due to self-other merging? *Journal of Personality and Social Psychology*, *73*(3), 495–509. https://doi.org/10.1037/0022-3514.73.3.495

Baumert, A., Schlösser, T., & Schmitt, M. (2014). Economic games: A performance-based assessment of fairness and altruism. *European Jornal of Psychology Assessment*, *30*, 178–192. https://doi.org/10.1027/1015-5759/a000183

Becker, G. S. (1964). *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. University of Chicago Press.

Benjamini, Y., & Hochberg, Y. (1995). Controlling the False Discovery Rate: A Practical and Powerful Approach to Multiple Testing. *Journal of the Royal Statistical Society Series B Methodological*,

*57*(1), 289–300. https://doi.org/10.1111/j.2517-6161.1995.tb02031.x

Birkett, M. (2014). Self-compassion and empathy across cultures: Comparison of young adults in China and the United States. *International Journal of Research Studies in Psychology*, *3*(3), 25–34. https://doi.org/10.5861/ijrsp.2013.551

Blair, R. J. R. (2005). Responding to the emotions of others Dissociating forms of empathy through the study of typical and psychiatric populations. *Consciousness and Cognition*, *14*(4), 698–718. https://doi.org/10.1016/j.concog.2005.06.004

Callan, M. J., Kim, H., Gheorghiu, A. I., & Matthews, W. J. (2017). The Interrelations Between Social Class, Personal Relative Deprivation, and Prosociality. *Social Psychological and Personality Science*, *8*(6), 660–669. https://doi.org/10.1177/1948550616673877

Chen, B., & Chang, L. (2012). Are 'Machiavellian' Chinese children well-adapted in the peer group? The relationship between resource acquisition strategies and social functioning and status. *Asian Journal of Social Psychology*, *15*(2), 122–131. https://doi.org/10.1111/j.1467-839X.2012.01373.x

Chen, Y., & Fan, X. (2015). Discordance between subjective and objective social status in contemporary China. *The Journal of Chinese Sociology*, *2*(1), 1–20. https://doi.org/10.1186/s40711-015-0017-7

Dormann, C. F., Elith, J., Bacher, S., Buchmann, C., Carl, G., Carré, G., Marquéz, J. R. G., Gruber, B., Lafourcade, B., Leitão, P. J., Münkemüller, T., McClean, C., Osborne, P. E., Reineking, B., Schröder, B., Skidmore, A. K., Zurell, D., & Lautenbach, S. (2013). Collinearity: a review of methods to deal with it and a simulation study evaluating their performance. *Ecography*, *36*(1), 27–46. https://doi.org/10.1111/j.1600-0587.2012.07348.x

Duncan, G. J., & Magnuson, K. (2012). Socioeconomic status and cognitive functioning: moving from correlation to causation. *Wiley Interdisciplinary Reviews: Cognitive Science*, *3*(3), 377–386. https://doi.org/10.1002/wcs.1176

Durante, F., Fiske, S. T., Gelfand, M. J., Crippa, F., Suttora, C., Stillwell, A., Asbrock, F., Aycan, Z., Bye, H. H., Carlsson, R., Björklund, F., Dagher, M., Geller, A., Larsen, C. A., Latif, A. A., Mähönen, T. A., Jasinskaja-Lahti, I., & Teymoori, A. (2017). Ambivalent stereotypes link to peace, conflict, and inequality across 38 nations. *Proceedings of the National Academy of Sciences*, 114(4), 669–674. https://doi.org/10.1073/pnas.1611874114

Edele, A., Dziobek, I., & Keller, M. (2013). Explaining altruistic sharing in the dictator game: The role of affective empathy, cognitive empathy, and justice sensitivity. *Learning And Individual Differences*, *24*, 96–102. https://doi.org/10.1016/j.lindif.2012.12.020

Eisenberg, N., Eggum, N. D., & Di Giunta, L. (2010). Empathy-related Responding: Associations with Prosocial Behavior, Aggression, and Intergroup Relations. *Soc Issues Policy Rev*, *4*(1), 143–180. https://doi.org/10.1111/j.1751-2409.2010.01020.x

Eisenberg, N., Guthrie, I. K., Cumberland, A., Murphy, B. C., Shepard, S. A., Zhou, Q., & Carlo, G. (2002). Prosocial development in early adulthood: A longitudinal study. *Journal of Personality and Social Pshcology*, *82*(6), 993–1006. https://doi.org/10.1037/0022-3514.82.6.993

Farah, M. J. (2017). The Neuroscience of Socioeconomic Status Correlates, Causes, and Consequences. *Neuron*, *96*(1), 56–71. https://doi.org/10.1016/j.neuron.2017.08.034

Farrelly, D., Moan, E., White, K., & Young, S. (2015). Evidence of an Alternative Currency for Altruism in Laboratory-Based Experiments. *Europe's Journal of Psychology*, *11*(1), 100–111. https://doi.org/10.5964/ejop.v11i1.855

Fehr, E., Bernhard, H., & Rockenbach, B. (2008). Egalitarianism in young children. *Nature*, *454*(7208), 1079–1083. https://doi.org/10.1038/nature07155

Fiske, S. T. (2010). Interpersonal stratification: Status, power, and subordination. In S. T. Fiske, D. T. Gilbert, & G. Lindzey (Eds.), *Handbook of social psychology* (pp. 941–982). John Wiley & Sons, Inc. https://doi.org/10.1002/9780470561119.socpsy002026

Forsythe, R., L, H. J., E, S. N., & Martin, S. (1994). Fairness in Simple Bargaining Experiments.*Games And Economic Behavior*, *6*(3), 347–369.https://doi.org/10.1006/game.1994.1021

Galinsky, A. D., Gruenfeld, D. H., & Magee, J. C. (2003). From Power to Action. *Journal Of Personality And Social Psychology*, *85*(3), 453–466. https://doi.org/10.1037/0022-3514.85.3.453

Goodwin, S. A., Gubin, A., Fiske, S. T., & Fiske, S. T. (2000). Power Can Bias Impression Processes: Stereotyping Subordinates by Default and by Design. *Group Process & Intergroup Relations*, *3*(3), 227–256. https://doi.org/10.1177/1368430200003003001

Guinote, A., Cotzia, I., Sandhu, S., & Siwa, P. (2015). Social status modulates prosocial behavior and egalitarianism in preschool children and adults. *Proceedings of the National Academy of Sciences*, 112(3), 731–736. https://doi.org/10.1073/pnas.1414550112

Gummerum, M., & Hanoch, Y. (2012). Altruism Behind Bars: Sharing, Justice, Perspective Taking and Empathy Among Inmates. *Social Justice Research*, *25*, 61–78. https://doi.org/10.1007/s11211-012-0149-8

Haidt, J. (2007). The New Synthesis in Moral Psychology. *Science*, *316*(5827), 998–1002. https://doi.org/10.1126/science.1137651

Hamamura, T., Xu, Q., & Du, Y. (2013). Culture, social class, and independence–interdependence: The case of Chinese adolescents. *International Journal of Psychology*, *48*(3), 344–351.https://doi.org/10.1080/00207594.2011.647030

Highlander, A. R., & Jones, D. J. (2021). Integrating Objective and Subjective Social Class to Advance Our Understanding of Externalizing Problem Behavior in Children and Adolescents: A Conceptual Review and Model. *Clinical Child and Family Pshcology Review, 25,* 300–315. https://doi.org/10.1007/s10567-021-00369-x

Keltner, D., Gruenfeld, D. H., & Anderson, C. (2003). Power, approach, and inhibition. *Psychological Review*, *110*(2), 265–284. https://doi.org/10.1037/0033-295X.110.2.265

Klimecki, O. M., Mayer, S. V., Jusyte, A., Scheeff, J., & Schönenberg, M. (2016). Empathy promotes altruistic behavior in economic interactions. *Scientific Reports*, *6*(1), 31961. https://doi.org/10.1038/srep31961

Kogut, T. (2012). Knowing what I should, doing what I want: From selfishness to inequity aversion in young children's sharing behavior. *Journal of Economic Psychology*, *33*(1), 226–236. https://doi.org/10.1016/j.joep.2011.10.003

Korndörfer, M., Egloff, B., Schmukle, S. C., & Espinosa, M. (2015). A Large Scale Test of the Effect of Social Class on Prosocial Behavior. *PLoS One*, *10*(7), e133193. https://doi.org/10.1371/journal.pone.0133193

Kraus, M. W., Piff, P. K., Mendoza-Denton, R., Rheinschmidt, M. L., & Keltner, D. (2012). Social class, solipsism, and contextualism: How the rich are different from the poor. *Psychological Review*, *119*(3), 546–572. https://doi.org/10.1037/a0028756

Kraus, M. W., Piff, P. K., & Keltner, D. (2009). Social class, sense of control, and social explanation. *Journal Of Personality And Social Psychology*, *97*, 992–1004. https://doi.org/10.1037/a0016357

Kuang, Y., Wang, F., & Wang, Z. (2021). Social Class and Children's Prosociality: A Study in the Context of China's Dual Urban–Rural Structure. *Social Psychological and Personality Science*, *12*(1), 63–70. https://doi.org/10.1177/1948550619887698

Li, W., Yang, Y., Wu, J., & Kou, Y. (2020). Testing the Status-Legitimacy Hypothesis in China: Objective and Subjective Socioeconomic Status Divergently Predict System Justification. *Personality and Social Psychology Bulletin*, *46*(7), 1044–1058. https://doi.org/10.1177/0146167219893997

Li, Z., Yu, J., Yang, X., & Zhu, L. (2019). Associations between empathy and altruistic sharing behavior in Chinese adults. *Journal Of General Psychology*, *146*(1), 1–16. https://doi.org/10.1080/00221309.2018.1510826

Liang, Y. S., Yang, H. X., Ma, Y. T., Lui, S. S. Y., Cheung, E. F. C., Wang, Y., & Chan, R. C. K (2019). Validation and extension of the Questionnaire of Cognitive and Affective Empathy in the Chinese setting. *PsyCh Journal*, *8*(4), 439–448. https://doi.org/10.1002/pchj.281

Liu, C., & Hao, F. (2017). Reciprocity belief and gratitude as moderators of the association between social status and charitable giving. *Personality And Individual Differences*, *111*, 46–50. https://doi.org/10.1016/j.paid.2017.02.003

Magee, J. C., & Galinsky, A. D. (2008). Social Hierarchy: The Self-Reinforcing Nature of Power and Status. *Academy of Management Annals*, *2*(1), 351–398. https://doi.org/10.5465/19416520802211628

Maner, J. K. (2017). Dominance and Prestige: A Tale of Two Hierarchies. *Current Directions In Psychological Science*, *26*(6), 526–531. https://doi.org/10.1177/0963721417714323

Mast, M. S., Khademi, M., & Palese, T. (2020). Power and social information processing. *Current opinion in psychology*, *33*, 42–46. https://doi.org/10.1016/j.copsyc.2019.06.017

Melchers, M. C., Li, M., Haas, B. W., Reuter, M., Bischoff, L., & Montag, C. (2016). Similar Personality Patterns Are Associated with Empathy in Four Different Countries. *Frontiers in Psychology, 7*:290.https://doi.org/10.3389/fpsyg.2016.00290

Melchers, M., Li, M., Chen, Y., Zhang, W., & Montag, C. (2015). Low empathy is associated with problematic use of the Internet: Empirical evidence from China and Germany. *Asian Journal of Psychiatry*, *17*, 56–60. https://doi.org/10.1016/j.ajp.2015.06.019

Miller, J. G., Kahle, S., & Hastings, P. D. (2015). Roots and Benefits of Costly Giving.*Psychological Science*, *26*(7), 1038–1045.https://doi.org/10.1177/0956797615578476

Morelli, S. A., Lieberman, M. D., & Zaki, J. (2015). The Emerging Study of Positive Empathy. *Social and Personality Psychology Compass*, *9*(2), 57–68. https://doi.org/10.1111/spc3.12157

Motsenok, M., & Ritov, I. (2021). The effect of perceived financial vulnerability on prosocial activity. *Journal Of Behavioral DecisionMaking*, *34*(1), 35–46. https://doi.org/10.1002/bdm.2198

Noble, K. G., Houston, S. M., Brito, N. H., Bartsch, H., Kan, E., Kuperman, J. M., Akshoomoff, N., Amaral, D. G., Bloss, C. S., Libiger, O., Schork, N. J., Murray, S. S., Casey, B. J., Chang, L., Ernst, T. M., Frazier, J. A., Gruen, J. R., Kennedy, D. N., Van Zijl, P., Mostofsky, S., Kaufmann, W. E., Kenet, T., Dale, A. M., Jernigan, T. L., & Sowell, E. R. (2015). Family Income, Parental Education and Brain Structure in Children and Adolescents. *Nature Neuroscience,*, *18*(5), 773–778. https://doi.org/10.1038/nn.3983

Noble, K. G., Houston, S. M., Kan, E., & Sowell, E. R. (2012). Neural correlates of socioeconomic status in the developing human brain. *Developmental Science*, *15*(4), 516–527. https://doi.org/10.1111/j.1467-7687.2012.01147.x

O'brien, R. M. (2007). A Caution Regarding Rules of Thumb for Variance Inflation Factors. *Quality & Quantity*, *41*(5), 673–690. https://doi.org/10.1007/s11135-006-9018-6

Ongley, S. F., & Malti, T. (2014). The role of moral emotions in the development of children's sharing behavior. *Developmental Pshcology*, *50*(4), 1148–1159. https://doi.org/10.1037/a0035191

Penner., L. A., Dovidio., J. F., Piliavin., J. A., & Schroeder, D. A. (2005). Prosocial Behavior: Multilevel Perspectives. *Annual Review of Psychology*, *56*(1), 365–392. https://doi.org/10.1146/annurev.psych.56.091103.070141

Piff, P. K., Kraus, M. W., Côté, S., Cheng, B. H., & Keltner, D. (2010). Having less, giving more: The influence of social class on prosocial behavior. *Journal Of Personality And Social Psychology*, *99*(5), 771–784. https://doi.org/10.1037/a0020092

Piff, P. K., & Robinson, A. R. (2017). Social class and prosocial behavior: current evidence, caveats, and questions. *Current opinion in psychology*, *18*, 6–10. https://doi.org/10.1016/j.copsyc.2017.06.003

Ragusa, J. M. (2015). Socioeconomic Stereotypes. *American Politics Research*, *43*(2), 327–359.https://doi.org/10.1177/1532673x14539547

Rakesh, D., Zalesky, A., & Whittle, S. (2021). Similar but distinct–Effects of different socioeconomic indicators on resting state functional connectivity Findings from the Adolescent Brain Cognitive Development (ABCD) Study. *Developmental Cognitive Neuroscience*, *51*, 101005. https://doi.org/10.1016/j.dcn.2021.101005

Reniers, R., Corcoran, R., Drake, R., Shryane, N., & Völlm, B. (2009). The QCAE: A questionnaire of cognitive and affective empathy. *European Psychiatry*, *24*(Suppl.1),1-1. https://doi.org/10.1016/s0924-9338(09)71073-9

James, R. N., & Sharpe, D. L. (2007). The Nature and Causes of the U-Shaped Charitable Giving Profile. *Nonprofit and Voluntary Sector Quarterly*, *36(2)*, 218–238. https://doi.org/10.1177/0899764006295993

Savage, M., Devine, F., Cunningham, N., Taylor, M., Li, Y., Hjellbrekke, J., Le Roux, B., Friedman, S., & Miles, A. (2013). A New Model of Social Class? Findings from the BBC's Great British Class Survey Experiment. *Sociology-The Journal Of The British Sociological Association*, *47*(2), 219–250. https://doi.org/10.1177/0038038513481128

Smith, A. (2006). Cognitive Empathy and Emotional Empathy in Human Behavior and Evolution. *The Psychological Record*, *56*, 3–21. https://doi.org/10.1007/BF03395534

Snibbe, A. C., & Markus, H. R. (2005). You Can't Always Get What You Want: Educational Attainment, Agency, and Choice. *Journal Of Personality And Social Psychology*, *88*(4), 703–720. https://doi.org/10.1037/0022-3514.88.4.703

Stamos, A., Lange, F., Huang, S., & Dewitte, S. (2020). Having less, giving more? Two preregistered replications of the relationship between social class and prosocial behavior. *JournalOf Research In Personality*, *84*, 103902. https://doi.org/10.1016/j.jrp.2019.103902

Stephens, N. M., Fryberg, S. A., & Markus, H. R. (2011). When Choice Does Not Equal Freedom. *Social Psychological and Personality Science*, *2*(1), 33–41. https://doi.org/10.1177/1948550610378757

Tan, J. J. X., Kraus, M. W., Abramson, L., & Adler, N. E. (2020). The association between objective and subjective socioeconomic status and subjective well-being: A meta-analytic review. *Psychology Bulletin*, *146*(11), 970–1020. https://doi.org/10.1037/bul0000258

Torelli, C. J., Leslie, L. M., To, C., & Kim, S. (2020). Power and status across cultures. *Current Opinion in Psychology*, *33*, 12–17.https://doi.org/10.1016/j.copsyc.2019.05.005

Van Doesum, N. J., Tybur, J. M., & Van Lange, P. A. M. (2017). Class impressions: Higher social class elicits lower prosociality. *Journal of experimental social psychology*, *68*, 11–20. https://doi.org/10.1016/j.jesp.2016.06.001

von Hermanni, H., & Tutić, A. (2019). Does economic inequality moderate the effect of class on prosocial behavior? A large-scale test of a recent hypothesis by Côté. *PLoS One*, *14*(8), e220723. https://doi.org/10.1371/journal.pone.0220723

West, S. G., Finch, J. F., & Curran, P. J. (1995). Structural equation models with nonnormal variables: Problems and remedies. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (pp. 56–75). Sage Publications, Inc

Yue, T., Wei, J., Huang, X., & Jiang, Y. (2016). Psychometric Properties of the Chinese Version of the Positive Empathy Scale Among Undergraduates. *Social Behavior and Personality: an international journal*, *44*(1), 131–138. https://doi.org/10.2224/sbp.2016.44.1.131

Zhang, J., & Han, T. (2021). Individualism and collectivism orientation and the correlates among Chinese college students. *Current Pasychology*. https://doi.org/10.1007/s12144-021-01735-2. Advance online publication

Zhao, Q., Neumann, D. L., Cao, Y., Baron-Cohen, S., Yan, C., Chan, R. C. K., & Shum, D. H. K. (2019). Culture–Sex Interaction and the Self-Report Empathy in Australians and Mainland Chinese. *Frontiers in Psychology*, *10*, 396. https://doi.org/10.3389/fpsyg.2019.00396

Zhao, Q., Neumann, D. L., Yan, C., Djekic, S., & Shum, D. (2021). Culture, Sex, and Group-Bias in Trait and State Empathy. *Frontiers in Psychology*, 12, 561930. https://doi.org/10.3389/fpsyg.2021.561930

Zhao, S. (2008). Application of human capital theory in China in the context of the knowledge economy. *The International Journal of Human Resource Management*, *19*(5), 802–817.https://doi.org/10.1080/09585190801991145

Zhong, C., Magee, J. C., Maddux, W. W., & Galinsky, A. D. (2006). Power, Culture, and Action: Considerations in the Expression and Enactment of Power in East Asian and Western Societies. *Research on Managing Groups and Teams*, *9*, 53–73. https://doi.org/10.1016/S1534-0856(06)09003-7

Deutsch, F., & Madle, R. A. (1975). Empathy: Historic and Current Conceptualizations, Measurement, and a Cognitive Theoretical Perspective. *Human Development*, 18(4), 267-287.https://doi.org/10.1159/000271488

Morelli, S. A., Rameson, L. T., & Lieberman, M. D. (2014). The neural components of empathy: Predicting daily prosocial behavior. *Social Cognitive and Affective Neuroscience*, 9(1), 39-47. https://doi.org/10.1093/scan/nss088