How Does Subjective Social Class Predict Prosocial Tendencies? A Moderated Chain Mediation Model Based on Reciprocity Beliefs

Authors: Wang Shizhuang, Sun Hongri, Sun Hongri

Date: 2023-09-30T00:00:00+00:00

Abstract

This study proposes that subjective social class can be further differentiated into subjective family class and subjective individual class, wherein the former predicts reciprocal beliefs through the latter, which subsequently predicts prosocial tendencies, yet the two components predict reciprocal beliefs and prosocial tendencies in different directions. A moderated chain mediation model based on reciprocal beliefs was constructed through small-scale psychological testing (Study 1), and further validated using data from the 2021 Chinese General Social Survey (CGSS2021) (Study 2). The results demonstrate that the pathway wherein subjective family class influences prosocial tendencies through the chain mediation of subjective individual class and reciprocal beliefs was cross-validated across studies; however, the direction of prediction from reciprocal beliefs to prosocial tendencies differed depending on the type of reciprocal belief. The moderating effect of individual relative deprivation and other pathways did not yield consistent results across the two studies. This research offers a novel approach for further resolving discrepancies in the literature regarding the prediction of prosocial tendencies by social class.

Full Text

How Does Subjective Social Class Predict Prosocial Tendency? A Moderated Chain Mediation Model Based on Reciprocity Belief

Wang Shizhuang[1],[2], **Sun Hongri**[1] [1] Department of Psychology, School of Public Policy and Management, Nanchang University, Nanchang 330031 [2] School of Psychology, South China Normal University, Guangzhou 510631

Abstract

This study proposes that subjective social class can be further refined into subjective family class and subjective individual class, where the former can predict reciprocity belief—and subsequently prosocial tendency—through the latter, though the two dimensions predict reciprocity belief and prosocial tendency in different directions. Through a small-scale psychological survey, we constructed a moderated chain mediation model based on reciprocity belief (Study 1) and further validated this model using data from the 2021 Chinese General Social Survey (CGSS2021) (Study 2). Results showed that the chain mediating pathway from subjective family class to prosocial tendency through subjective individual class and reciprocity belief was cross-validated, though the direction of reciprocity belief' s prediction of prosocial tendency varied by reciprocity belief type. The moderating effect of individual relative deprivation and other pathways did not yield consistent results across both studies. This research provides a novel approach to clarifying divergent findings on how social class predicts prosocial tendency.

Keywords: subjective family class; subjective individual class; prosocial tendency; reciprocity belief; individual relative deprivation

Classification: B849: C91

Research on "who is more prosocial, high or low social class" has yielded inconsistent results, and conclusions tend to generate group stigma (Sun et al., 2023), making it imperative to clarify how social class influences prosocial tendency. Previous studies have examined this relationship from three levels: micro-individual, meso-contextual, and macro-social (Yuan et al., 2019). Reciprocity belief, a micro-individual factor affecting the social class-prosocial tendency relationship, refers to "the extent to which individuals believe that reciprocity norms are widely and effectively used by others" (Yuan et al., 2019). It represents the ideological and cognitive dimension of an individual' s internal reciprocity norms and serves as a distal factor determining actual reciprocal behavior (Perugini et al., 2003). This study examines reciprocity belief as a mediator to explore its role between subjective social class and prosocial tendency, thereby revealing the social exchange mechanism underlying this relationship.

1.1 Subjective Social Class and Its Prediction of Prosocial Tendency

Social class refers to an individual' s rank and position within a social hierarchy (Yuan et al., 2019; Kraus et al., 2012). Different classes exhibit not only objective differences in material and social resources but also subjective differences in perceived relative social position through social comparison (Kraus et al., 2012; Guo et al., 2015). Consequently, social class has both objective and subjective dimensions. Research indicates that subjective social class reflects a "cognitive averaging" of socioeconomic status (Nielsen et al., 2015) and demonstrates stronger predictive power, correlating more highly with individual psychology and behavior (Kraus et al., 2013).

Prosocial tendency encompasses all voluntary behaviors and inclinations that benefit others and society in social interactions, including but not limited to comforting, sharing, cooperating, helping, and sacrificing (Penner et al., 2005). Research on subjective social class' s prediction of prosocial tendency has produced mixed findings. One perspective argues that lower social class individuals exhibit greater prosocial tendency. In daily life, perceived limitations in material and social resources make it difficult for lower-class individuals to achieve life goals independently, necessitating help from others and fostering good relationships through cooperation. This increases their attention to others' needs and empathy levels, resulting in higher prosocial tendency (Stellar et al., 2012; Piff & Robinson, 2017). Large-scale surveys have also found that individuals with lower annual incomes show higher prosocial tendency (James & Sharp, 2007).

However, recent research indicates that higher social class individuals sometimes demonstrate greater prosocial tendency than their lower-class counterparts (Xie & Li, 2018; Korndörfer et al., 2015). Social exchange theory posits that pure altruism does not exist; individuals performing prosocial behaviors incur costs and correspondingly expect returns. When costs exceed returns or become too high, prosocial tendency decreases (Dovidio et al., 2017). Higher social class individuals, possessing abundant resources, face fewer constraints from resource costs and thus more readily exhibit prosocial tendency. Additionally, research from perspectives of perceived control and self-efficacy (Gallo et al., 2006), motivational differences (Kraus & Callaghan, 2016), and social distance (Xie & Li, 2018) has consistently supported the view that higher social class individuals show greater prosocial tendency.

Nevertheless, these studies primarily examine achieved social status (i.e., personal social status). When investigating adolescent health issues, Goodman (2001) proposed that subjective social class should be refined into subjective family social class and subjective personal (school) social class: the former assesses individuals' perception of their parents' position in the social hierarchy, while the latter assesses individuals' position among peers or in the social hierarchy. Research on education and employment has found that family economic status in 7th grade positively predicts academic performance in 9th grade and educational achievement in mid-adulthood (Yeung & Xia, 2023). Family economic status also positively predicts graduate students' academic engagement (Lai & Peng, 2022) and influences employment destinations and outcomes for recent graduates (Qiao et al., 2014). This demonstrates that family economic status provides a foundation for individual status, influencing status attainment through its impact on children' s development, educational experiences (Matthews & Gallo, 2010), and career choices. This study further distinguishes subjective social class into subjective family social class and subjective individual social class, proposing that the former, as an ascribed factor, can predict individual prosociality through the mediating role of the latter.

1.2 Reciprocity Belief and Its Mediating Role

Reciprocity, as a core feature of social exchange theory (Zou et al., 2012), is frequently used to explain prosocial phenomena. Reciprocity refers to "the tendency to respond similarly after others provide benefits or inflict harm" (Sun & Yang, 2023). Based on equality, timeliness, and the focus of interest, reciprocity can be divided into three forms: generalized reciprocity, balanced reciprocity, and negative reciprocity (Sparrow & Linden, 1997; Zou et al., 2012). Generalized reciprocity focuses more on others' interests with lower requirements for equality and timeliness, tending toward altruistic and cooperative social value orientations and preferring benevolence. Balanced reciprocity is sensitive to fairness, focusing on equality and timeliness, and tends toward cooperative and individualistic social values. Negative reciprocity focuses on self-interest, privileges, and requires high equality and timeliness, oriented toward competitive social values. Extensive research shows that social value orientation is closely related to prosociality (Van Lange, 1999), suggesting that the relationship between reciprocity and prosocial tendency varies by reciprocity type (Zou et al., 2012). Strong belief in generalized and balanced reciprocity can enhance prosociality, whereas strong belief in negative reciprocity reduces it.

Reciprocity embodies the resource cycle between "giving" and "returning" (Sun & Yang, 2023). Although belief in this resource exchange is informal (Wu et al., 2006), it provides "implicit yet explicit social exchange rules based on nonverbal mutual trust" (Su et al., 2023). Research has found that reciprocity belief mediates the relationship between personal control and corrupt behavior (Su et al., 2023), leadership style and organizational trust (Jia et al., 2007), among others. Accordingly, we hypothesize that reciprocity belief also mediates the relationship between subjective social class and prosocial tendency. However, because family class and individual class differ in their resource cycles within "giving-returning" reciprocal relationships, their predictions of reciprocity belief also differ. Traditional Chinese society emphasizes Confucian ethics of "parental kindness and filial piety"(Zhao, 2011). The ascribed nature of family class makes individuals passive "returners"in parent-child benevolent reciprocal relationships, while the discounting of prosocial exchange returns (Flynn & Yu, 2021) leads to moral principles centered on "emphasizing filial piety over parental kindness"regulating intra-family relationships (Wang & Wu, 2011), creating an imbalanced parent-child benevolent reciprocity cycle. Research shows that higher family class parents can provide more resources for their children' s development (including economic investment and psychological support) and are more likely to avoid risks from adverse family environments (Matthews et al., 2010), which helps reconcile the imbalance in this benevolent cycle and facilitates reciprocity belief formation.

Unlike the ascribed nature of family social class, individual social class primarily represents returns from active status competition. Evolutionary theory suggests that in status competition, coercive and aggressive behaviors serve the same function as prosocial behaviors, and their combined use can "maximize

resource control and social advantage" (Hawley et al., 2007). Research on adolescent peer status attainment and maintenance found that as dominance (social status) increases, the combined use of prosocial and coercive (relational or overt aggression) strategies also increases (Massey et al., 2015), indicating that status competition does not always follow reciprocity strategies. Additionally, as an accumulative resource, status has persistent effects and self-maintaining properties, and high status acquisition is gainful, helping obtain other advantages (Cheng et al., 2018), thereby enhancing individuals' sense of control. Research has found that control levels negatively predict reciprocity belief (Su et al., 2023). Thus, whether from the process or outcome of status competition, achieved social class negatively predicts individuals' reciprocity belief.

In summary, reciprocity belief can mediate the relationship between subjective family class and prosocial tendency, but family social class and individual social class predict reciprocity belief in opposite directions. This characteristic creates divergent predictive directions for prosocial tendency through the mediation of reciprocity belief.

1.3 The Moderating Effect of Individual Relative Deprivation

Individual relative deprivation is a subjective cognitive and emotional experience arising from social comparison, referring to individuals' perception of their disadvantaged position and resulting feelings of dissatisfaction and anger when comparing themselves to reference individuals or groups (Xiong & Ye, 2016). Research has found that individual relative deprivation and subjective individual social class mutually inhibit each other when predicting prosocial tendency, both negatively predicting prosociality, such that relative deprivation enhances the effect of individual social class on prosocial tendency (Callan et al., 2017). Additionally, perceiving social comparison-based disadvantage as unfair constitutes a decisive component of relative deprivation (Smith et al., 2012), which can induce preferences for immediate rewards (Callan et al., 2009). The core of reciprocity belief is the conviction that giving will be rewarded. Within this belief framework, individuals with high relative deprivation, driven by reward expectations, may view prosocial behavior as a strategy to correct unfairness and obtain deserved outcomes, thereby developing a preference for it. Thus, individual relative deprivation may have an enhancing moderating effect on the relationship between reciprocity belief and prosocial tendency.

In summary, this study refines subjective social class into ascribed subjective family class and achieved subjective individual class, incorporating reciprocity belief and individual relative deprivation to examine how subjective social class predicts prosocial tendency and the mediating roles of different reciprocity belief types and the moderating role of individual relative deprivation.

This paper proposes the following hypotheses: 1. Subjective family class positively predicts prosocial tendency; higher family class leads to greater prosocial tendency. 2. Subjective individual class mediates the relationship between sub-

jective family class and prosocial tendency. 3. Reciprocity belief mediates the relationship between subjective family class and prosocial tendency. Balanced reciprocity belief plays a mediating role, while negative reciprocity belief plays a suppressing role. 4. Subjective school class and reciprocity belief form a chain mediation between subjective family class and prosocial tendency. This chain mediating pathway functions differently under different reciprocity beliefs: subjective individual class and balanced reciprocity belief play a suppressing role, while subjective individual class and negative reciprocity belief play a mediating role. 5. Individual relative deprivation moderates: (a) the relationship between subjective family class and prosocial tendency negatively, (b) the relationship between subjective individual class and prosocial tendency positively (enhancing), and (c) the relationship between reciprocity belief and prosocial tendency positively (enhancing).

[Figure 1: see original paper] Conditional process model of subjective family class influencing prosocial tendency

2.1 Participants

We recruited university students through online platforms "Wenjuanxing" and "Naudor," obtaining 598 valid participants (90.74% valid response rate). Sixty-one cases of careless responding (failing attention checks) were removed. Participants had a mean age of 22.91 ± 4.81 years. The sample included 167 males (33.9%) and 325 females (65.7%). By grade level: 41 freshmen (8.3%), 103 sophomores (20.9%), 91 juniors (18.5%), 168 seniors (34.1%), and 89 fifth-year or above (18.1%). Household registration: 111 from large cities (22.6%), 196 from small towns (39.8%), and 185 from rural areas (37.6%). Monthly family income: 9 (1.8%) below ¥2,000, 111 (22.6%) ¥2,001-6,000, 96 (19.5%) ¥6,001-8,000, 94 (19.1%) ¥8,001-10,000, 100 (20.3%) ¥10,001-15,000, 50 (10.2%) ¥15,001-20,000, and 33 (6.7%) above ¥20,000.

2.2 Study Variables

Subjective Family Class. In Study 1, the predictor variable was subjective family class, measured using the MacArthur Scale of Subjective Socioeconomic Status developed by Adler et al. (2000) and adapted by Goodman (2001) to assess perceived family position in society. Participants rated their position on a 10-rung ladder, where 1 represented the lowest subjective class and 10 the highest; higher scores indicated higher subjective class. Goodman (2001) reported Cronbach' s alphas of 0.73 and 0.79 for subjective family class and subjective school class, respectively. After Chinese adaptation by Hu et al. (2012), test-retest reliabilities were 0.76 and 0.71, respectively, demonstrating good reliability and validity.

Subjective Individual Class. We measured subjective school class as the indicator of subjective individual class, serving as the first mediator. The measurement method was identical to subjective family class but adapted from

Goodman (2001) to reflect individual position within the school hierarchy.

Prosocial Tendency. Participants then completed the prosocial tendency measure, the outcome variable. We used the Prosocial Tendencies Measure questionnaire originally developed by Carlo and Randall (2002) and revised by Cong (2008). The scale comprises six dimensions with 23 items. The overall scale' s Cronbach' s alpha was 0.85, with subscale alphas as follows: public (4 items) 0.75, anonymous (5 items) 0.83, altruistic (5 items) 0.63, compliant (2 items) 0.73, emotional (4 items) 0.64, and urgent (3 items) 0.63. Using a 5-point scale (1 = "not at all like me," 5 = "very much like me"), higher scores indicated greater prosocial tendency and likelihood of prosocial behavior. In this study, the overall scale' s Cronbach' s alpha was 0.83.

Balanced Reciprocity Belief. In Study 1, the second mediator was balanced reciprocity belief, measured using the General Reciprocity Belief Scale from the Personal Norms of Reciprocity Scale revised by Z. Zhang and J. Zhang (2012). The Personal Norms of Reciprocity Scale was developed by Perugini et al. (2003) based on personal reciprocity beliefs. Z. Zhang and J. Zhang (2012) adapted the General Reciprocity Belief Scale for mainland China, removing item 4 ("If I work hard, I expect to be rewarded") due to low correlation with the total score. The revised scale contains 8 items with Cronbach' s alpha of 0.69 and test-retest reliability of 0.70. Using a 7-point scale (1 = "strongly disagree," 7 = "strongly agree"), higher scores indicated stronger reciprocity belief, i.e., higher balanced reciprocity belief. In this study, the scale' s Cronbach' s alpha was 0.81.

Individual Relative Deprivation. Finally, we measured individual relative deprivation, the moderating variable, using a revised version of Callan et al.' s (2011) Personal Relative Deprivation Scale with 5 items. Based on the cognitive and affective components of individual relative deprivation, the scale uses a 6-point format (1 = "strongly disagree," 6 = "strongly agree"), with higher scores indicating stronger relative deprivation. The revised scale' s internal consistency reliability was 0.78, and in this study, Cronbach's alpha was 0.70, demonstrating good reliability.

Control Variables. Control variables included gender (1 = male; 2 = female), age, grade level (1 = freshman; 5 = fifth-year or above), monthly family income (1 = below ¥2,000; 7 = above ¥20,000), and household registration (1 = large city; 2 = small town; 3 = rural).

2.3.1 Common Method Bias Test

Although this study used anonymous responding and reverse-coded items to control common method bias, we conducted Harman' s single-factor test due to self-reported data. Results showed 7 factors with eigenvalues greater than 1, with the first factor explaining 20.76% of variance—well below the 40% threshold —indicating no serious common method bias.

2.3.2 Descriptive Statistics and Correlation Analysis

Descriptive statistics and correlations are presented in Table 1 . Subjective family class positively correlated with subjective individual class ($r = 0.43$, $p < 0.001$) and prosocial tendency ($r = 0.19$, $p < 0.001$), and negatively correlated with individual relative deprivation ($r = -0.26$, $p < 0.001$). Subjective individual class positively correlated with prosocial tendency ($r = 0.09$, $p < 0.05$) and negatively correlated with balanced reciprocity belief ($r = -0.08$, $p < 0.05$) and individual relative deprivation ($r = -0.30$, $p < 0.001$). Balanced reciprocity belief positively correlated with prosocial tendency ($r = 0.33$, $p < 0.001$) and individual relative deprivation ($r = 0.32$, $p < 0.001$). These coefficients support subsequent testing of the moderated chain mediation model.

2.3.3 Hypothesis Testing and Results

We used the PROCESS macro to examine the chain mediation effects of subjective individual class and balanced reciprocity belief between subjective family class and prosocial tendency. Controlling for gender, age, grade, household registration, and monthly family income, with subjective family class as the predictor, prosocial tendency as the outcome, and subjective individual class and balanced reciprocity belief as mediators, we tested the chain mediation model using SPSS PROCESS Model 6 (Hayes, 2017). All variables were standardized. Results are shown in Table 2 .

Subjective family class significantly positively predicted prosocial tendency. For direct effects, subjective family class' s effect on prosocial tendency was 0.94, 95% CI [0.25, 1.62], excluding 0, supporting Hypothesis 1. For indirect effects, three pathways emerged: (1) Subjective individual class as mediator: effect = 0.18, 95% CI [-0.08, 0.46], containing 0, indicating non-significant mediation, thus Hypothesis 2 was not supported; (2) Balanced reciprocity belief as mediator: effect = 0.25, 95% CI [0.01, 0.54], excluding 0, indicating significant mediation, supporting Hypothesis 3; (3) Chain mediation through subjective individual class and balanced reciprocity belief: effect = -0.12, 95% CI [-0.23, -0.02], demonstrating a suppression effect (Wen & Ye, 2014).

We then used linear regression to test the moderating effect of individual relative deprivation (Table 3). Model 1 showed subjective family class significantly positively predicted prosocial tendency ($B = 1.26$, $p < 0.001$). Model 2 showed subjective family class significantly positively predicted balanced reciprocity belief ($B = 0.42$, $p < 0.001$). Model 4 showed balanced reciprocity belief significantly positively predicted prosocial tendency ($B = 0.45$, $p < 0.001$), reconfirming its mediating role. Model 2 also showed subjective family class significantly positively predicted subjective individual class ($B = 0.42$, $p < 0.001$), and Model 3 showed subjective individual class significantly negatively predicted balanced reciprocity belief ($B = -0.63$, $p < 0.01$), reconfirming the suppression effect. Model 5 revealed that the interaction between balanced reciprocity belief and individual relative deprivation significantly positively affected prosocial tendency

(B = 0.04, p < 0.001), indicating that individual relative deprivation positively moderated the relationship between balanced reciprocity belief and prosocial tendency.

Finally, we examined the moderated mediation effect using bootstrapping (Table 4). Results showed that individual relative deprivation significantly moderated the chain indirect path through subjective individual class and balanced reciprocity belief (95% CI [-0.03, -0.001]), further validating its moderating effect. Combined with Table 4 and Figure 2 [Figure 2: see original paper], as individual relative deprivation increased, the absolute value of the mediation effect grew larger, indicating stronger mediation. Thus, individual relative deprivation exerted an enhancing effect on this pathway, supporting Hypothesis 5.

Study 1 explored the prediction model of subjective family class on prosocial tendency. Controlling for other variables, subjective family class directly positively predicted prosocial tendency, supporting social exchange theory and demonstrating that higher subjective family class leads to greater prosocial tendency. Balanced reciprocity belief significantly mediated this relationship, again supporting social exchange theory—higher social class individuals develop stronger balanced reciprocity belief, which influences their prosocial tendency. The negative effect of the chain through subjective individual class and balanced reciprocity belief revealed a suppression effect, with subjective individual class negatively predicting balanced reciprocity belief—a finding warranting further investigation. Individual relative deprivation positively moderated the relationship between balanced reciprocity belief and prosocial tendency, strengthening the chain indirect effect. In summary, a moderated chain indirect psychological mechanism exists between subjective family class and prosocial tendency.

3.1 Data Source and Variable Selection

While Study 1 examined the prediction and mechanism of subjective family class on prosocial tendency, Study 2 used CGSS2021 data (National Survey Research Center, Renmin University of China, 2021) to further validate this relationship and enhance model robustness, exploring differences between balanced and negative reciprocity beliefs in this mechanism.

Subjective Family Class. In Study 2, the predictor remained subjective family class, measured using item A43d (“What class do you think your family was in when you were 14?”). The measurement method matched Study 1.

Subjective Individual Class. The first mediator was subjective individual class, measured using item A43a (“Overall, in today’ s society, which level do you think you yourself are in?”). The measurement method was identical to A43d.

Negative Reciprocity Belief. The second mediator in Study 2 was negative reciprocity belief. CGSS2021 included item A34: “Overall, do you agree that in this society, if you’ re not careful, others will try to take advantage of you?”

(1 = strongly disagree; 2 = somewhat disagree; 3 = neither agree nor disagree; 4 = somewhat agree; 5 = strongly agree; 98 = don' t know; 99 = refused). We used a 5-point scoring method.

Prosocial Tendency. The outcome variable was prosocial tendency, measured using item D5: "Would you be willing to pay higher taxes to improve universal healthcare in China?" (1 = very willing; 2 = somewhat willing; 3 = neither willing nor unwilling; 4 = somewhat unwilling; 5 = very unwilling; 98 = cannot choose; 99 = refused). We reverse-coded responses using a 5-point scale.

Individual Relative Deprivation. The moderating variable was individual relative deprivation, measured using item D35-7: "Compared to people around me, I feel very content." (1 = strongly disagree; 2 = disagree; 3 = somewhat disagree; 4 = somewhat agree; 5 = agree; 6 = strongly agree; 98 = don' t know; 99 = refused). We used a 6-point scale and reverse-coded responses.

Control Variables. Study 2 controlled for gender (A2: 1 = male; 2 = female), age (A3a), highest education level (A7a: 1 = no education; 13 = graduate or above), birthplace household registration (A27d: 1 = rural; 7 = other), and family economic status (A64: 1 = far below average; 5 = far above average), corresponding to Study 1' s controls.

We excluded participants responding "98 = cannot choose" or "99 = refused" on any item, yielding 2,312 valid cases. The mean age was 52.26 $\pm$ 17.32 years, with 54.9% female.

3.2.1 Correlations Among Main Variables

Descriptive statistics and correlations for Study 2 are shown in Table 5 . Subjective family class positively correlated with subjective individual class ($r = 0.42$, $p < 0.001$) and prosocial tendency ($r = 0.08$, $p < 0.001$). Subjective individual class negatively correlated with negative reciprocity belief ($r = -0.11$, $p < 0.001$) and positively correlated with prosocial tendency ($r = 0.10$, $p < 0.001$). Negative reciprocity belief negatively correlated with prosocial tendency ($r = -0.07$, $p < 0.001$). Subjective family class ($r = -0.06$, $p < 0.01$), subjective individual class ($r = -0.17$, $p < 0.001$), and prosocial tendency ($r = -0.10$, $p < 0.001$) all negatively correlated with individual relative deprivation, while negative reciprocity belief positively correlated with it ($r = 0.10$, $p < 0.001$). These coefficients support subsequent moderated chain mediation model testing.

3.2.2 Hypothesis Testing and Results

Analytical methods followed Study 1. Controlling for gender, age, household registration, highest education level, and family economic status, with subjective family class as predictor, prosocial tendency as outcome, and subjective individual class and negative reciprocity belief as mediators, we tested the chain mediation model using SPSS PROCESS Model 6 (Hayes, 2017). Results are shown in Table 6 .

Subjective family class significantly predicted prosocial tendency. For direct effects, the effect was 0.024, 95% CI [-0.004, 0.052], marginally significant ($p = 0.09$). For indirect effects, three pathways emerged: (1) Subjective individual class as mediator: effect = 0.012, 95% CI [0.001, 0.023], excluding 0, indicating significant mediation, supporting Hypothesis 2; (2) Negative reciprocity belief as mediator: effect = -0.001, 95% CI [-0.003, 0.002], indicating non-significant mediation, thus Hypothesis 3 was not supported; (3) Chain mediation through subjective individual class and negative reciprocity belief: effect = 0.002, 95% CI [0.001, 0.003], indicating significant mediation. These variables demonstrated chain mediation between subjective family class and prosocial tendency, supporting Hypothesis 4, though the direction differed from Study 1.

We further examined mediation and moderation using linear regression (Table 7). Model 1 showed subjective family class significantly positively predicted prosocial tendency ($B = 0.04$, $p < 0.01$). Model 2 showed subjective family class significantly positively predicted subjective individual class ($B = 0.36$, $p < 0.001$). Model 4 showed subjective individual class significantly positively predicted prosocial tendency ($B = 0.03$, $p < 0.05$), reconfirming its mediating effect. Model 3 showed subjective individual class significantly negatively predicted negative reciprocity belief ($B = -0.07$, $p < 0.001$), and Model 4 showed negative reciprocity belief significantly negatively predicted prosocial tendency ($B = -0.07$, $p < 0.01$), reconfirming the chain mediation. Model 5 revealed that the interaction between negative reciprocity belief and individual relative deprivation did not significantly affect prosocial tendency ($B = 0.02$, $p > 0.05$), though the interaction with subjective family class was significant ($B = 0.02$, $p < 0.05$), indicating significant moderation on the direct effect.

Bootstrapping examined the moderated direct effect (Table 8). Results showed individual relative deprivation moderated the direct path between subjective family class and prosocial tendency. The prediction of prosocial tendency by subjective family class had boundary conditions: at high levels of individual relative deprivation, subjective family class directly predicted prosocial tendency. As individual relative deprivation increased, the absolute value of the direct effect grew larger, indicating stronger direct prediction. Thus, individual relative deprivation exerted an enhancing effect on this pathway, supporting Hypothesis 5a.

Study 2 validated the prediction model using CGSS2021 data. Controlling for demographics, subjective family class still positively predicted prosocial tendency, consistent with Study 1. However, unlike Study 1, Study 2 found a significant mediating effect of subjective individual class between subjective family class and prosocial tendency, did not validate the mediating effect of negative reciprocity belief, but confirmed chain mediation through subjective individual class and negative reciprocity belief. Individual relative deprivation moderated the direct path but not the relationship between reciprocity belief and prosocial tendency.

4.1 High Subjective Family Class, High Reciprocity Belief, and High Prosocial Tendency

Both studies consistently found that higher subjective family class predicts higher prosocial tendency. Study 1 also demonstrated that higher subjective family class associates with stronger balanced reciprocity belief.

From a social exchange perspective, pure altruism does not exist; expecting returns is a condition for prosocial behavior (Dovidio et al., 2017). As an ascribed condition for subjective individual class, subjective family class' s relationship with prosocial tendency aligns with previous research on achieved social class and prosocial tendency (Xie & Li, 2018; Korndörfer et al., 2015). Higher subjective family class typically entails greater socioeconomic resources, fewer resource constraints, stronger belief in prosocial returns, and consequently higher prosocial tendency.

This result can be further understood through mental accounting, where individuals weigh costs and benefits before decision-making (Thaler, 1985). Mental accounting applies to prosocial behavior' s costs and benefits. People form different behavioral decisions based on their account resources' origins, and subjective family class and subjective individual class generate psychologically distinct accounts. As an ascribed resource source, subjective family class is perceived as less difficult to obtain and valued differently than achieved subjective individual class. Therefore, when perceived socioeconomic status is family-derived, individuals more readily exhibit prosocial tendency, whereas individually-derived status requires more cost-benefit calculation before prosocial behavior.

This phenomenon can also be explained through Chinese family traditions and reinforcement learning theory. Family-level "reciprocity" traditions promote reciprocity belief. Intergenerational reciprocity is widespread in Chinese families, with traditional family cooperative systems and familistic responsibility ethics containing reciprocal logic (Zhao, 2011; Flynn & Yu, 2021). This family reciprocity may lead individuals to maintain family socioeconomic status through higher reciprocity. Additionally, Hackel and Zaki (2018) found that individuals preferentially reward high-wealth givers, who more easily complete give-return exchange cycles. This process reinforces social exchange learning: high social class individuals more readily complete exchanges, enhancing their reciprocity belief and promoting subsequent prosocial behavior.

4.2 Low Reciprocity Belief Among High Subjective Individual Class in Chain Mediation

Although Study 2 found that high subjective individual class associated with lower reciprocity belief, it confirmed their higher prosocial tendency, providing stronger evidence for subjective social class' s positive prediction of prosociality. Both studies found high subjective individual class associated with lower reciprocity belief—an unprecedented finding.

First, this may relate to China' s "involution" social environment. Whether educational involution in schools or occupational involution in society, contemporary environments feature intense competition (Lu, 2021). High subjective individual class individuals have experienced and face fiercer competition, which reduces cooperative beliefs like reciprocity. From social cognition theory, high subjective individual class individuals exhibit self-centered tendencies, focusing on personal goals and being less influenced by social environments (Kraus et al., 2012), thus attending less to social norms. In highly competitive environments, to maintain their status and with abundant resources, they rely more on themselves, exchange resources sparingly or within their class, or reserve resources for intra-class exchange. Conversely, low subjective individual class individuals show situational cognition, are more interpersonal, and cooperate to solve problems for survival (Piff & Robinson, 2017). This makes them more attentive to social norms, which they value and practice to maintain relationships.

Second, subjective family class and subjective individual class may involve different mental accounts. Thaler (1985) proposed that individuals and families maintain separate mental accounts, with money in different accounts being nonfungible and eliciting different attitudes and spending tendencies. Arkes et al. (1994) demonstrated that hard-earned money is spent more cautiously than windfall gains. Subjective family class and subjective individual class likely represent two subjective perceptions formed under different mental accounts. When engaging in prosocial behavior, these accounts produce different attitudes toward costs. As an ascribed factor, subjective family class is perceived as easier to obtain and cognitively processed differently than achieved subjective individual class, which is earned through personal effort. The personal experience of obtaining subjective individual class leads to more comprehensive cognition and cautious attitudes toward those resources. Thus, high subjective individual class individuals may approach reciprocal social exchange more from self-interest than reciprocity.

4.3 Reciprocity Belief Types Influence Prosocial Tendency Prediction Direction

As a core concept in social exchange theory, reciprocity is a social norm influencing psychology and behavior (Chen et al., 2009). Reciprocity beliefs differ in reciprocity norms and social value orientations (Zou et al., 2012), differentially affecting prosocial tendency.

Under balanced reciprocity, exchange parties must provide equivalent resources without specific requirements for content or timing, relying on mutual compliance to achieve the give-return cycle. Although sensitive to equality and fairness, this process' s voluntariness and timeliness benefit prosocial tendency. Negative reciprocity, while also exchanging equivalent resources, is highly self-interested, aiming to maximize personal benefit and sometimes harming others. Essentially, negative reciprocity is pure interest exchange with competitive characteristics (Zou et al., 2012), negatively affecting prosocial tendency.

4.5 Contributions

Methodological: Prosocial behavior research using university students is often criticized for limited representativeness. This study innovatively built a psychological model using student data and validated it with national survey data, enhancing robustness and verifying the social exchange pathway (chain mediation) based on reciprocity belief–a key methodological contribution.

Theoretical: First, this study provides new insights and evidence for resolving discrepancies regarding subjective social class and prosocial tendency. By distinguishing ascribed subjective family class from achieved subjective individual class and logically positioning family class as an antecedent of individual class, we clarified the influence mechanism and better supported the view that "higher subjective social class shows higher prosocial tendency." Second, incorporating reciprocity belief revealed its mediating role and the chain mediation of subjective individual class and reciprocity belief, with different reciprocity beliefs playing distinct roles. While Liu and Hao (2017) found reciprocity belief moderated the association between social class and charitable giving, this study further demonstrates that social class influences prosocial tendency through reciprocity belief, deepening understanding of its role.

4.6 Limitations and Future Directions

First, only balanced and negative reciprocity beliefs were examined; whether and how positive reciprocity belief functions in this model requires investigation. Second, Fu et al. (2018) found different neural activity for distrust versus trust decisions using ERPs, suggesting questionnaire responses may lack depth. Future research combining EEG and fMRI could examine whether different reciprocity beliefs relate to distinct brain regions, providing physiological evidence for their differential effects on prosocial tendency. Third, the individual mediating effects of subjective individual class and reciprocity belief, and alternative moderation pathways, were not cross-validated–representing a limitation. Finally, Study 2 used tax payment as a representative prosocial behavior, partially validating the model. As an economic prosocial indicator, this supports applying this psychological mechanism to economic domains.

References (already in English, preserved as in original)

Appendix 1: Demographic Variables for Study 1

Dear Students,

Hello! Welcome to this psychology survey!

I am a 2019-level applied psychology student. This questionnaire examines university students' views on everyday issues. There are no right or wrong answers;

please respond according to your actual situation. Your personal information and data will be used strictly for research purposes and kept confidential.

The questionnaire takes approximately 5-10 minutes. As compensation, you will receive appropriate remuneration. Through participation, you will gain deeper reflection on university students' everyday perspectives, significantly contributing to theoretical and practical research.

As this study is ongoing, please keep survey information confidential. Thank you for your participation and voluntary completion. For questions, please contact the survey administrator at 15226901137.

Please select the option that best matches your 真实情况 for each item. There are no right or wrong answers, and responses are strictly confidential.

1. Your age: [fill-in-the-blank] *{{{_}}{{}}}{{{_}}{{}}_}{{{}}{{}}_}{{{_}}{{}}____}*
2. Your gender: [single choice] *
   - Male
   - Female
3. Your major: [single choice] *
   - Humanities and social sciences
   - Science and engineering
   - Other
4. Your current grade level: [single choice] *
   - Freshman
   - Sophomore
   - Junior
   - Senior
   - Fifth-year or above
5. Your place of origin: [single choice] *
   - Large city
   - Small town
   - Rural area
6. Please estimate your family' s monthly income (including bonuses, dividends, and other income): [single choice] *
   - Below ¥2,000
   - ¥2,001-6,000
   - ¥6,001-8,000
   - ¥8,001-10,000
   - ¥10,001-15,000
   - ¥15,001-20,000
   - Above ¥20,000

Appendix 2: Subjective Socioeconomic Status Scale

Imagine the ladder below depicts China' s social hierarchy: - The top rung represents the wealthiest, most highly educated, and most respected professionals. - The bottom rung represents the poorest, least educated, unemployed, or those

with undesirable, disrespected jobs.

Which rung do you think your family occupies? Please select the corresponding number. [single choice] *

[10-point ladder scale from 1 to 10]

Imagine the ladder below depicts your school: - The top rung represents the most respected, highest-achieving, highest-status people in your school. - The bottom rung represents the least respected, lowest-achieving, most isolated people.

Which rung do you think you occupy? Please select the corresponding number. [single choice] *

[10-point ladder scale from 1 to 10]

Appendix 3: Prosocial Tendencies Measure

The following items concern your behaviors or thoughts in interpersonal interactions. Please indicate the degree to which each statement describes you using a 1-5 scale (1 = "not at all like me," 5 = "exactly like me"). There are no right or wrong answers.

1. I would help others to the best of my ability when in the public eye.
2. My greatest sense of achievement comes from comforting those in great pain.
3. I find it easier to help those in need when others are present.
4. I think the most beneficial aspect of helping others is that it gives me a good image.
5. I gain the most benefits when helping those in need while others are present.
6. I am willing to help those in danger or urgent need.
7. I do not hesitate when others ask for my help.
8. I prefer to donate anonymously.
9. I am more inclined to help those who are seriously injured.
10. Donating money or goods is most meaningful when I have received benefits.
11. I often help those in need without revealing information about myself.
12. I tend to help others, especially when they are emotionally distressed.
13. When I become the public focus while helping others, I try my best to perform well.
14. It is not difficult for me to provide help to those in terrible, urgent need.
15. In most situations, I help others without leaving my name.
16. I believe those who invest time and energy in charity work should receive more recognition.
17. I am most likely to help others in emotionally charged situations.
18. I never hesitate when someone asks for help.
19. I believe helping others without revealing my information is the best helping scenario.

20. The greatest benefit of charity work is that it enriches my resume.
21. When infected by everyone' s emotions, I want to help those in difficulty.
22. I often donate anonymously because it makes me happy.
23. I believe if I help others, they should help me in return.

Appendix 4: General Reciprocity Belief Scale

The following statements concern everyday interpersonal interactions. Please indicate your agreement level using a 1-7 scale (1 = "strongly disagree," 7 = "strongly agree"). There are no right or wrong answers, and responses are strictly confidential.

1. Helping someone is the best strategy to ensure they will help you in the future.
2. I am not unkind to others to avoid them being unkind to me.
3. I fear the reactions of those I haven' t treated well before.
4. When I praise someone, I expect them to reciprocate.
5. I avoid being impolite because I don' t want others to be impolite to me.
6. If I help tourists, I hope they will be grateful.
7. Obviously, if I treat someone badly, they will retaliate.
8. If I am critical of restaurant food or service, I expect poor service in the future.

Appendix 5: Individual Relative Deprivation Scale

The following items concern your self-perceptions. Please indicate your agreement level using a 1-6 scale (1 = "completely disagree," 6 = "completely agree"). There are no right or wrong answers, and responses are strictly confidential.

1. Compared to what people like me have, I feel disadvantaged.
2. Compared to people like me, I feel privileged.
3. Seeing how wealthy people like me are makes me angry.
4. Compared to people like me, I have a lot.
5. Compared to what people like me have, I feel very dissatisfied.

Appendix 6: Selected Items from CGSS2021

Subjective Social Class: A43. In our society, some people are at the top, others at the bottom. This ladder [show card 5] is viewed from top to bottom. The highest "10" represents the top level, the lowest "1" represents the bottom level.

- Subjective individual class: a. Overall, in today' s society, which level do you think you yourself are in?
- Subjective family class: d. What class do you think your family was in when you were 14?

[10-point scale from 1 to 10, with options for 98 = don' t know, 99 = refused]

Negative Reciprocity Belief: A34. Overall, do you agree that in this society, if you' re not careful, others will try to take advantage of you?

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree
- Don' t know
- Refused

Prosocial Tendency: D5. Would you be willing to pay higher taxes to improve universal healthcare in China?

- Very willing
- Somewhat willing
- Neither willing nor unwilling
- Somewhat unwilling
- Very unwilling
- Cannot choose
- Refused

Individual Relative Deprivation: D35. How much do you agree with the following statements? [show card 19]

7. Compared to people around me, I feel very content.

- Strongly disagree
- Disagree
- Somewhat disagree
- Somewhat agree
- Agree
- Strongly agree
- Don' t know
- Refused

Note: Figure translations are in progress. See original paper for figures.