Effects of Face Consciousness Level and Type on Cooperative Behavior: The Moderating Role of Others' Presence

Authors: Zhou Jingkun, Ma Hong, Cui Liying, Wu Aruna, Zhang Guoli, Fu Zhen, Cui Liying

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Abstract

This study investigated the influence of face consciousness on cooperation through four experiments, as well as the moderating effects of payoff framing and the presence of others. Experiment 1 first examined the effect of face consciousness on cooperative behavior in public goods dilemmas ("give" frame) and common resource dilemmas ("take" frame), comparing differences across payoff frames. Experiment 2 introduced the variable of others' presence to investigate the moderating role of situational publicity/anonymity in the relationship between face consciousness and cooperation. Experiment 3 selected high-scoring "face-gain seekers" and "face-loss avoiders," while Experiment 4 activated face-gain consciousness and face-loss consciousness through task manipulations. These two experiments respectively examined, from trait and state levels, the influence of different types of face consciousness on cooperation and the moderating effect of others' presence. Results showed that high face-conscious individuals exhibited significantly higher cooperative behavior in public goods dilemmas than low face-conscious individuals, whereas no significant difference emerged between the two groups in common resource dilemmas. Compared with anonymous situations, public situations effectively promoted cooperative behavior among face-conscious individuals in public goods dilemmas, an effect primarily reflected in face-gain seeking. These findings indicate that the facilitative effect of face consciousness on cooperative behavior is shaped by situational characteristics such as "give/take" and "public/anonymous," as well as by different types of "gain/loss."

Full Text

Preamble

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Response: First, regarding research content, previous studies have focused on the relationship between face and altruistic prosocial behavior, as well as the impact of face concerns on cooperative games. This study, however, examines the relationship between individual face consciousness and cooperation in multi-person public dilemmas. It not only reveals how the level and type of face consciousness affect cooperative behavior but also investigates the boundary conditions of this influence: benefit framing and the presence of others. This research not only helps us understand the functions of different types of face consciousness in cooperative interactions but also provides a new perspective from both cultural and individual levels on the factors influencing cooperative behavior.

Second, regarding methodology, we designed four experiments, all of which employed multi-person, multi-round repeated experimental paradigms to measure cooperative behavior. To examine the effects of face consciousness types, we used two approaches: Experiment 3 adopted a trait perspective, comparing cooperative behavior differences between individuals with high desire-to-gain-face and high fear-of-losing-face; Experiment 4 adopted a state perspective, examining whether cooperative behavior differs after activating different types of face consciousness—that is, whether activating the desire to gain face versus the fear of losing face affects cooperation. The consistent results from these two experiments, from both trait and state perspectives, demonstrate that the desire to gain face can effectively enhance cooperation, increasing the persuasiveness of our findings.

Face and Cooperation Literature: - Tjosvold, D., Hui, C., & Sun, H. (2000). Social face and open-mindedness: Constructive conflict in Asia. In

Asian management matters: Regional relevance and global impact, 2000, 3-16. - 叶红心, 张朋柱. (2003). 社会面子与合作博弈. 管理工程学报, 2, 1–4.

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Response: This study reports effect sizes.

5. Please state your planned sample size and actual sample size. If they differ, please explain why. The pervasive problem of low statistical power due to insufficient sample sizes in psychological research requires authors to explain the basis for sample size determination in the Methods section. Sample size should be determined based on a justified effect size and desired power, with the calculation software or program reported. For guidance on sample size planning, see https://osf.io/5awp4/

Response: - **Experiment 1:** Using G*Power 3.1, with Effect size f = 0.25, $\alpha = 0.05$, to achieve 80% statistical power, 128 participants were required. We recruited 168 participants and excluded 15 participants who showed extreme values (always 100 or 0) in all 12 rounds of investment and withdrawal. The final sample consisted of 153 participants (64 males, 42%; 89 females, 58%; mean age = 18.79 years, SD = 4.44).

- **Experiment 2:** Using G*Power 3.1, with Effect size f = 0.25, $\alpha = 0.05$, to achieve 80% statistical power, 128 participants were required. We invited 156 eligible students and excluded 13 participants with extreme values (always 100 or 0) in all 12 rounds. The remaining 143 participants completed the experiment (high face consciousness group: 74 participants, 40 in public condition, 34 in anonymous condition; low face consciousness group: 69 participants, 32 in public condition, 37 in anonymous condition; 90 males, 63%; 53 females, 37%; mean age = 18.91 years, SD = 0.90).
- **Experiment 3:** Using G*Power 3.1, with Effect size f = 0.25, $\alpha = 0.05$, to achieve 80% statistical power, 128 participants were required. We recruited 158 participants, excluded 14 with extreme investment values (always 100 or 0) across 6 rounds and 4 who did not complete all tasks. The final sample was 140 participants (high desire-to-gain-face group: 70 participants, 33 public, 37 anonymous; high fear-of-losing-face group: 70 participants, 34 public, 36 anonymous; 64 males, 46%; 76 females, 54%; mean age = 19.42 years, SD = 1.47).
- **Experiment 4:** Using G*Power 3.1, with Effect size f = 0.25, $\alpha = 0.05$, to achieve 80% statistical power, 158 participants were required. We recruited 250 participants from a university in Shaanxi and excluded 11 with extreme investment values (always 100 or 0). The final sample was 239 participants (desire-to-gain-face group: 80 participants, 41 public, 39 anonymous; fear-of-losing-face group: 75 participants, 42 public, 33 anonymous; control group: 84 participants, 40 public, 44 anonymous; 137 males, 57%; 102 females, 43%; mean age = 20.80 years, SD = 2.28).

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The Effect of Level and Type of Face Consciousness on Cooperative Behavior: The Moderating Role of the Presence of Others

Abstract

This study investigated the influence of face consciousness on cooperation and the moderating effects of benefit framing and the presence of others through four experiments. Experiment 1 first explored how face consciousness affects cooperative behavior in public goods dilemmas ("give" frame) versus common resource

dilemmas ("take" frame), comparing differences across benefit frames. Experiment 2 introduced the variable of others' presence to examine how situational publicity/anonymity moderates the relationship between face consciousness and cooperation. Experiment 3 screened participants as high "desire-to-gain-face" and high "fear-of-losing-face" individuals, while Experiment 4 used task manipulations to activate these two types of face consciousness. These two experiments examined the effects of different types of face consciousness on cooperation and the moderating role of others' presence from both trait and state perspectives.

Results showed that individuals with high face consciousness exhibited significantly higher cooperation in public goods dilemmas than those with low face consciousness, while no significant difference emerged in common resource dilemmas. Compared to anonymous conditions, public conditions effectively promoted cooperation among face-conscious individuals in public goods dilemmas, primarily manifesting in the desire to gain face. These findings indicate that the facilitative effect of face consciousness on cooperative behavior is influenced by situational features such as "give/take" and "public/anonymous," as well as by different types of face consciousness.

Keywords: Face consciousness, Desire to gain face, Fear of losing face, Presence of others, Cooperative behavior

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Introduction

The *Shuowen Jiezi* states: "Face (面) is the front of the countenance, resembling the shape of a human face; all things related to face derive from face." Face encompasses multiple meanings, referring both to one's facial features and to one's social image—that is, "mianzi" or reputation. It can be understood as how people interact with each other and thus creates the question of "how others see me" (翟学伟, 2021). Face has always been the guiding principle of the Chinese spirit, inseparable from traditional Confucian culture, which emphasizes self-restraint and returning to propriety, linking "face" with "li" (ritual propriety). "Li" represents a social norm, implying that only when individuals learn, know, and understand ritual can they gain social recognition and thus obtain face (孙德玉, 李盼盼, 2020). Individuals with strong face consciousness care more about whether their social image is recognized and accepted by others and are concerned with others' evaluations (魏新东等, 2023).

Is being face-conscious a good or bad thing? Previous research has found that face can be a double-edged sword. On one hand, to maintain their superior social status, face-conscious individuals may exhibit more selfishness, thereby harming collective interests (Zhao et al., 2019). On the other hand, to maintain their image in others' eyes and avoid shame in social interactions (Li et al., 2004), they may also demonstrate more benevolent behaviors (Liu et al., 2021), such as increased charitable donations (Xie & Shi, 2022). These divergent results suggest that face consciousness may either stimulate achievement needs, leading

to self-advancement and greater selfishness, or stimulate belongingness needs, promoting group integration and greater altruism.

As a complex social and cultural construct, face can be divided into two dimensions: the desire to gain face and the fear of losing face. Gaining face refers to an individual's performance exceeding society's positive expectations, while losing face refers to performance falling below society's minimum acceptable standards or failure to satisfy important needs consistent with one's role or status (魏新东，张凯丽, 2023; Zhang et al., 2011). Research has found that the desire to gain face and the fear of losing face produce different behavioral patterns. Individuals who want to gain face hope to receive external praise to satisfy their need for social recognition, so they actively work to establish a positive social image, engage in self-presentation and self-marketing, and contribute more to the collective (Huang et al., 2008; Wang & Wang, 2018; 戴万亮等, 2022). Losing face means that an individual's dignity and positive social image in others' eyes are damaged, triggering shame and embarrassment (Kam & Bond, 2008; Zhou & Zhang, 2017). Therefore, individuals who fear losing face prevent public humiliation by reducing self-disclosure and self-presentation in collective settings (Hwang et al., 2003). Evidently, these two types of face consciousness—"desire to gain face" and "fear of losing face"—have different effects on choices between selfish and altruistic behavior. So what is the relationship between cooperation, an indispensable form of social interaction emphasizing reciprocity and mutual benefit between self and other, and the level or type of face consciousness?

Cooperative behavior involves two or more individuals coordinating their activities to accomplish a task or achieve a goal for mutual benefit (赵章留, 寇彧, 2006). Compared to other types of prosocial behavior, cooperation emphasizes behavioral interaction between parties (李晶, 朱莉琪, 2014; Henrich & Henrich, 2006). According to the morality-strength hypothesis, prosocial individuals tend to view cooperation as moral, believing cooperative partners are more honest and fair, whereas pro-self individuals view cooperation as inefficient and believe cooperative partners lack ability (Utz et al., 2004; van Lange, 2000). Prosocial individuals are more willing to believe they are cooperative people, as cooperation not only generates positive self-feelings but also benefits society (陈晓萍, 2013). Will face-conscious individuals therefore choose cooperation to gain others' recognition and maintain face? Or will they avoid cooperation to prevent negative evaluation, adopting an attitude of "the less trouble, the better"? Although previous research has explored the relationship between face consciousness and prosocial behavior, it has focused primarily on helping behaviors (Li & Zhao, 2019; Xie & Shi, 2022), with little investigation of cooperation, leaving this question unanswered. Based on this gap, the present study examines the relationship between face consciousness and cooperative behavior from the perspectives of both level and type of face consciousness, using two cooperation paradigms (public goods dilemma and common resource dilemma) across four experiments, while also exploring the boundary conditions of this effect. Experiment 1 first investigates the relationship between face consciousness and cooperation. Experiment 2 examines a boundary condition—others' presence—

on the facilitative effect of face on cooperation. Experiments 3 and 4 distinguish two types of face consciousness: desire to gain face and fear of losing face, comparing their relationships with cooperation and the moderating role of others' presence from both trait and state perspectives.

Based on impression management theory, face is a purposeful self-presentation behavior aimed at creating specific impressions in others, representing a typical impression management behavior (王晓婧, 张绍杰, 2015). This means that to have face, individuals must exhibit behaviors that benefit their self-image and establish good social reputations. For example, complying with social norms yields more social recognition and helps gain face, while violating social norms causes face loss (Kim & Nam, 1998). Individuals who care about face are more concerned with others' opinions and therefore exhibit higher levels of normative behavior (Wang et al., 2023). In Chinese culture, on one hand, ingroup harmony and stability are emphasized, requiring individuals to maintain cooperative and modest behavior (魏新东等, 2023). On the other hand, social achievement is an important pathway to gaining face, with face being a reputation or prestige obtained through social accomplishment (Hu, 1944). Since cooperation is both a normative behavior and an important means of achieving social success, we infer that face-conscious individuals may be more willing to cooperate. Thus, we propose Hypothesis 1: Face consciousness affects individuals' cooperative behavior, with stronger face consciousness associated with higher levels of cooperation.

Will the desire to gain face and the fear of losing face differentially affect cooperation? Research has found that compared to gaining face, Chinese people are more afraid of losing face, with this fear becoming an important principle guiding behavior (袁立新, 2018). Individuals who fear losing face are more likely to hold a "less trouble is better" mentality, adopting more conservative strategies in team work, such as reducing individual contributions to the team (Huang et al., 2008; Wang & Wang, 2018; 戴万亮等, 2022) and showing passive withdrawal in achievement tasks to avoid failure (Tang et al., 2022; Chua & Bedford, 2016; Begley & Tan, 2001). In contrast, those who desire to gain face may hold a "proactive attack" mentality, contributing more resources in team work (Huang et al., 2008; Wang & Wang, 2018; 戴万亮等, 2022) and showing proactive pursuit of success in achievement tasks (Begley & Tan, 2001). When individuals have stronger desires for success, they are more willing to participate in team affairs, help others, and cooperate with others (金丹，2011; 崔丽莹，2011). These results suggest that compared to individuals who fear losing face, those who desire to gain face may be more willing to contribute in group work, showing stronger cooperative intentions. Accordingly, we propose Hypothesis 2: Individuals with a desire to gain face exhibit higher levels of cooperative behavior than those with a fear of losing face.

If face consciousness can promote cooperation, does this facilitative effect have boundary conditions? Research has found that when individuals discover others are present or that they are being observed, they tend to exhibit more cooperative behavior (王建峰, 戴冰, 2020; Lv et al., 2024). The presence of others may

subject individuals to social norm pressures, leading them to behave in ways consistent with their moral image and social norms (吴琴, 崔丽莹, 2020; Chekroun & Brauer, 2002). Since face is largely derived from external evaluation, face-conscious individuals should actively exhibit more prosocial behaviors when others are present (Li & Zhao, 2019). We therefore infer that face-conscious individuals will exhibit more cooperative behaviors that meet others' expectations when others are present. Thus, we propose Hypothesis 3: The presence of others moderates the relationship between face consciousness and cooperative behavior, such that face-conscious individuals show higher cooperation in public than in anonymous conditions. Additionally, since individuals who desire to gain face are proactive in teams and more willing to contribute, while those who fear losing face are passive and less willing to contribute (戴万亮等, 2022), the former may become even more proactive when others are present to obtain positive evaluation and good reputation. Accordingly, we propose Hypothesis 4: The presence of others moderates the relationship between different types of face consciousness and cooperative behavior, such that individuals with a desire to gain face show higher cooperation in public than in anonymous conditions.

Experiment 1: The Effect of Face Consciousness Level on Cooperative Behavior

2.1.1 Experimental Design and Participants

A one-way ANOVA was used. The independent variable was face consciousness level, and the dependent variable was cooperative behavior, measured by investment amounts in the public goods dilemma and withdrawal amounts in the common resource dilemma. Using G*Power 3.1, with Effect size f = 0.25, α = 0.05, to achieve 80% statistical power, 128 participants were required. We distributed 1,600 face consciousness questionnaires to students at two universities in Shaanxi. Participants scoring in the top 27% were assigned to the high face consciousness group, and those in the bottom 27% to the low face consciousness group. We recruited 168 participants and excluded 15 who showed extreme values (always 100 or 0) in all 12 rounds of investment and withdrawal. The final sample consisted of 153 participants (76 in the high face consciousness group, 77 in the low face consciousness group; 64 males, 42%; 89 females, 58%; mean age = 18.79 years, SD = 4.44).

2.1.2 Experimental Materials

Face Consciousness Scale: We used the Face Consciousness Scale developed by Zhang et al. (2011). This 11-item scale includes two dimensions: desire to gain face and fear of losing face, rated on a 7-point scale. Higher scores indicate stronger face consciousness. In this study, Cronbach's α was 0.865 for overall face consciousness, 0.839 for desire to gain face, and 0.813 for fear of losing face.

2.1.3 Experimental Procedure

Participants were invited to the laboratory in groups of 12, randomly assigned to groups of 4, and informed that they would interact with different partners each round. They first completed rule comprehension tests, then participated in the public goods dilemma and common resource dilemma experiments (using an ABBA sequence to control for time-order effects). The entire experiment lasted approximately 20 minutes, and participants received a small gift afterward.

Public Goods Dilemma: We created a web-based public goods game using Python OTree. Each round, every group member received 100 game coins and could invest any amount (0-100) into a public account. If the total public account reached $ $200, it would double and be distributed equally among all members; if <200, the investment would be confiscated. After each round, participants received feedback on their earnings and total personal account balance. The game comprised 6 rounds.

Common Resource Dilemma: We created a web-based common resource dilemma game using Python OTree. The group shared a public account initially containing 400 game coins each round, from which each member could withdraw 0-100 coins. After withdrawal, the remaining amount would double and be distributed equally among members. The game comprised 6 rounds. Higher investment in the public goods dilemma indicated higher cooperation, while higher withdrawal in the common resource dilemma indicated lower cooperation.

2.2 Results

A one-way ANOVA examined the effect of face consciousness level on cooperative behavior. Results are shown in Table 1 . Face consciousness had a significant effect on cooperation in the public goods dilemma, $F(1, 152) = 21.61$, $p < 0.001$, with the high face consciousness group investing significantly more than the low face consciousness group. The effect on cooperation in the common resource dilemma was not significant, $F(1, 152) = 0.59$, $p = 0.443$.

Table 1: Cooperative Behavior Scores (M ± SD) of High and Low Face Consciousness Groups in Two Social Dilemmas

Group	n	Public Goods Dilemma	Common Resource Dilemma
High Face Consciousness	76	69.39 ± 16.16	51.21 ± 27.35
Low Face Consciousness	77	55.84 ± 19.70	54.72 ± 29.14

Note: Amounts in public goods dilemma represent mean investment; amounts in common resource dilemma represent mean withdrawal.

Experiment 1 found that high and low face consciousness individuals differed in cooperative behavior across social dilemmas. Specifically, high face consciousness promoted cooperation in the public goods dilemma (“give” frame) but not

in the common resource dilemma ("take" frame). These results partially support Hypothesis 1, indicating that the facilitative effect of face consciousness on cooperation is influenced by the "give/take" benefit frame.

Although Experiment 1 revealed that face consciousness affects cooperation differently across situations, the underlying mechanisms and boundary conditions remain unclear. Therefore, Experiment 2 builds on Experiment 1 by introducing the variable of others' presence to examine how face consciousness affects cooperation under anonymous versus public conditions.

Experiment 2: The Moderating Effect of Others' Presence on the Relationship Between Face Consciousness Level and Cooperative Behavior

3.1.1 Experimental Design and Participants

A 2 (Face Consciousness: high, low) × 2 (Others' Presence: public, anonymous) between-subjects design was used. Independent variables were face consciousness level and others' presence; dependent variables were cooperative behavior in public goods and common resource dilemmas, measured by investment and withdrawal amounts. Using G*Power 3.1, with Effect size f = 0.25, $\alpha = 0.05$, to achieve 80% statistical power, 128 participants were required. We distributed 770 face consciousness questionnaires (same as Experiment 1) to students at a university in Shaanxi, assigning the top 27% to the high face consciousness group and bottom 27% to the low face consciousness group. We invited 156 eligible students, excluded 13 with extreme values (always 100 or 0) across 12 rounds, leaving 143 valid participants (high face consciousness: 74 participants, 40 public, 34 anonymous; low face consciousness: 69 participants, 32 public, 37 anonymous; 90 males, 63%; 53 females, 37%; mean age = 18.91 years, SD = 0.90).

3.1.2 Experimental Procedure

Participants were invited to the laboratory, completed rule comprehension tests, then participated in public goods and common resource dilemma experiments (using ABBA sequence to control time-order effects). We used Python OTree to create web-based public goods and common resource games, each with 6 rounds. Others' presence was manipulated as public versus anonymous conditions. In the anonymous condition, participants were told they formed 4-person groups with students in three other classrooms, with identities kept confidential. In the public condition, participants drew lots to form 4-person groups, sat around a round table where they could see each other (but not communicate). The experiment lasted approximately 20 minutes, and participants received a small gift afterward.

3.2 Results

Separate ANOVAs were conducted with face consciousness and others' presence as independent variables and cooperative behavior in each dilemma as dependent variables (see Table 2).

Public Goods Dilemma: The main effect of face consciousness was significant, $F(1, 139) = 15.56$, $p < 0.001$, with the high face consciousness group investing significantly more than the low face consciousness group. The main effect of others' presence was significant, $F(1, 139) = 8.34$, $p = 0.004$, with higher investment in public than anonymous conditions. The interaction was significant, $F(1, 139) = 5.89$, $p = 0.017$, $^2 = 0.04$. Simple effects tests (see Figure 1 [Figure 1: see original paper]) showed that in the public condition, high face consciousness individuals invested significantly more than low face consciousness individuals; in the anonymous condition, no significant difference emerged.

Common Resource Dilemma: The main effect of face consciousness was not significant, $F(1, 139) = 0.692$, $p = 0.407$. The main effect of others' presence was not significant, $F(1, 139) = 0.185$, $p = 0.668$. The interaction was not significant, $F(1, 139) = 1.228$, $p = 0.270$.

Table 2: Cooperative Behavior Scores (M ± SD) of High and Low Face Consciousness Groups Under Different Conditions

Condition	Public Goods Dilemma	Common Resource Dilemma
High Face Consciousness - Public	82.43 ± 10.11	48.69 ± 32.93
Low Face Consciousness - Public	66.23 ± 15.81	58.52 ± 25.32
High Face Consciousness - Anonymous	68.91 ± 16.79	52.12 ± 30.19
Low Face Consciousness - Anonymous	65.05 ± 17.36	50.73 ± 30.89

Note: Amounts in public goods dilemma represent mean investment; amounts in common resource dilemma represent mean withdrawal.

Figure 1: Interaction Between Face Consciousness and Others' Presence in Public Goods Dilemma (M ± SE)

Experiment 2 found that in the public goods dilemma, the effect of face consciousness on cooperation was moderated by others' presence: high face consciousness individuals invested significantly more than low face consciousness individuals in public conditions, but no difference emerged in anonymous conditions. These results partially support Hypothesis 3, showing that face affects cooperation differently depending on others' presence and, consistent with Experiment 1, that face only promotes cooperation in public goods dilemmas ("give" frame), not in common resource dilemmas ("take" frame).

These results demonstrate that face consciousness level does affect cooperation, but do the two types of face consciousness—desire to gain face and fear of losing

face—differentially promote cooperation? Although research indicates different face types affect individual behavior in teams (戴万亮等, 2022), their effects on cooperation remain unclear. Therefore, building on Experiment 2, Experiment 3 further examined the effects of high desire-to-gain-face consciousness and high fear-of-losing-face consciousness on cooperation and how situational publicity/anonymity moderates these relationships. Since Experiments 1 and 2 found no effect of face consciousness on cooperation in common resource dilemmas, subsequent experiments used only the public goods dilemma paradigm.

Experiment 3: The Effect of Face Consciousness Type on Cooperative Behavior

4.1.1 Participants

A 2 (Face Consciousness Type: high desire-to-gain-face, high fear-of-losing-face) × 2 (Others' Presence: public, anonymous) between-subjects design was used. Independent variables were face consciousness type and others' presence; the dependent variable was cooperative behavior in the public goods dilemma, measured by investment amount. Using G*Power 3.1, with Effect size f = 0.25, α = 0.05, to achieve 80% statistical power, 128 participants were required. We distributed 2,308 face consciousness questionnaires (same as Experiment 1) to students at a university in Shaanxi. Using person-centered analyses (Coplan et al., 2016; Coplan et al., 2013), we classified participants scoring in the top 25% on desire-to-gain-face and bottom 75% on fear-of-losing-face as the high desire-to-gain-face group (N = 189), and those scoring in the top 25% on fear-of-losing-face and bottom 75% on desire-to-gain-face as the high fear-of-losing-face group (N = 195). We invited 158 eligible participants, excluded 14 with extreme investment values (always 100 or 0) and 4 who did not complete all tasks, leaving 140 valid participants (high desire-to-gain-face: 70 participants, 33 public, 37 anonymous; high fear-of-losing-face: 70 participants, 34 public, 36 anonymous; 64 males, 46%; 76 females, 54%; mean age = 19.42 years, SD = 1.47).

4.1.2 Experimental Procedure

Participants were invited to the laboratory, completed rule comprehension tests, then participated in the public goods dilemma experiment. We used a Python OTree web-based public goods game with 6 rounds. Others' presence was manipulated as public versus anonymous conditions, following the same procedure as Experiment 2.

4.2 Results

A two-way ANOVA with face consciousness type and others' presence as independent variables and cooperative behavior as dependent variable showed: The

main effect of face consciousness type was significant, F(1, 136) = 8.78, p = 0.004, with the high desire-to-gain-face group (M = 71.48, SD = 19.45) investing significantly more than the high fear-of-losing-face group (M = 63.17, SD = 16.93). The main effect of others' presence was significant, F(1, 136) = 4.56, p = 0.035, with higher investment in public (M = 70.69, SD = 18.89) than anonymous conditions (M = 64.36, SD = 18.03). The interaction was significant, F(1, 136) = 9.00, p = 0.003, ^{2} = 0.06. Simple effects tests (see Figure 2 [Figure 2: see original paper]) showed that in public conditions, the high desire-to-gain-face group invested significantly more (M = 79.53, SD = 15.59) than the high fear-of-losing-face group (M = 61.85, SD = 17.88). No significant difference emerged between types in anonymous conditions.

Figure 2: Interaction Between Face Consciousness Type and Others' Presence in Public Goods Dilemma (M ± SE)

Experiment 3 found that different types of face consciousness differentially affect cooperative behavior. The high desire-to-gain-face group not only showed enhanced cooperation in the public goods dilemma but also exhibited higher cooperation levels in public conditions. These results support Hypotheses 2 and 4, demonstrating that the desire to gain face facilitates cooperative behavior.

However, Experiment 3 only examined the relationship between face type and cooperation at the trait level. To test the robustness of these effects, Experiment 4 used a state activation manipulation to evoke desire-to-gain-face and fear-of-losing-face consciousness, further exploring how face consciousness type affects cooperation and how others' presence moderates this relationship.

Experiment 4: The Effect of State-Activated Face Consciousness Type on Cooperative Behavior

5.1.1 Experimental Design and Participants

A 3 (Face Consciousness Activation: desire-to-gain-face, fear-of-losing-face, control) × 2 (Others' Presence: public, anonymous) between-subjects design was used. Independent variables were face consciousness activation type and others' presence; the dependent variable was cooperative behavior in the public goods dilemma, measured by investment amount. Using G*Power 3.1, with Effect size f = 0.25, α = 0.05, to achieve 80% statistical power, 158 participants were required. We recruited 250 participants from a university in Shaanxi, excluded 11 with extreme investment values (always 100 or 0), leaving 239 valid participants (desire-to-gain-face: 80 participants, 41 public, 39 anonymous; fear-of-losing-face: 75 participants, 42 public, 33 anonymous; control: 84 participants, 40 public, 44 anonymous; 137 males, 57%; 102 females, 43%; mean age = 20.80 years, SD = 2.28).

5.1.2 Experimental Materials

Face Consciousness Activation Tasks: Following Wang (2020) and colleagues, we developed recall and priming tasks for different face consciousness types.

Desire-to-Gain-Face Group: (1) Recall task: Participants recalled something they had done to gain face. (2) Priming task: Participants read and imagined: "In class, you just saw your exam score was unsatisfactory and felt discouraged. The teacher then invites everyone to a knowledge competition in a field you're familiar with and can definitely win. You're considering whether to participate." The manipulation check asked: "To what degree do you want to gain face right now?" (1-5 scale), with higher scores indicating stronger desire.

Fear-of-Losing-Face Group: (1) Recall task: Participants recalled something they had done to prevent losing face. (2) Priming task: Participants read and imagined: "In class, the teacher invites you to a knowledge competition in an unfamiliar field you'll definitely lose. You're considering how to decline." The manipulation check asked: "To what degree do you fear losing face right now?" (1-5 scale), with higher scores indicating stronger fear.

Control Group: (1) Recall task: Participants recalled their daily schedule for the past two days. (2) Priming task: Participants read an article about Hainan Island, then answered: "To what degree do you fear losing face right now?" and "To what degree do you want to gain face right now?"

5.1.3 Material Validation

To test the effectiveness of our materials, we piloted them with 442 university students (desire-to-gain-face: 140; fear-of-losing-face: 201; control: 101). Independent samples t-tests showed significant differences between the desire-to-gain-face group and control group ($t = 4.01$, $p < 0.001$), with higher desire-to-gain-face scores ($M = 3.11$, $SD = 1.11$) than control ($M = 2.40$, $SD = 1.47$). The fear-of-losing-face group also differed significantly from control ($t = 5.18$, $p < 0.001$), with higher fear-of-losing-face scores ($M = 5.54$, $SD = 1.35$) than control ($M = 1.69$, $SD = 1.34$). These results confirm the materials effectively activated different face consciousness types.

5.1.4 Experimental Procedure

After entering the laboratory, participants completed the recall and imagination questionnaires (as described above), then played 6 rounds of the public goods dilemma game in either public or anonymous conditions, following the same procedure as Experiments 2 and 3.

5.2.1 Manipulation Check

To verify successful activation of face consciousness types, we conducted independent samples t-tests on face consciousness scores across groups. Results

showed significant differences between the desire-to-gain-face group and control group ($t = 3.68$, $p < 0.001$), with higher desire-to-gain-face scores ($M = 3.09$, $SD = 1.25$) than control ($M = 2.40$, $SD = 1.47$). The fear-of-losing-face group also differed significantly from control ($t = 4.13$, $p < 0.001$), with higher fear-of-losing-face scores ($M = 2.50$, $SD = 1.30$) than control ($M = 1.66$, $SD = 1.34$). These results confirm successful manipulation of face consciousness types.

5.2.2 Effects of Face Consciousness Type and Others' Presence on Cooperation

A two-way ANOVA with face consciousness type and others' presence as independent variables and cooperative behavior as dependent variable showed: The main effect of face consciousness type was significant, $F(2, 233) = 6.45$, $p = 0.002$. Post-hoc tests revealed that the desire-to-gain-face group ($M = 76.79$, $SD = 19.18$) invested significantly more than both the fear-of-losing-face group ($M = 70.05$, $SD = 19.44$) and control group ($M = 66.42$, $SD = 19.39$), with no significant difference between the latter two groups. The main effect of others' presence was significant, $F(1, 233) = 8.04$, $p = 0.005$, with higher investment in public ($M = 74.25$, $SD = 18.01$) than anonymous conditions ($M = 67.54$, $SD = 20.94$). The interaction was significant, $F(1, 233) = 7.33$, $p < 0.001$, $^2 = 0.06$. Simple effects tests (see Figure 3 [Figure 3: see original paper]) showed that in public conditions, the desire-to-gain-face group ($M = 85.32$, $SD = 11.35$) invested significantly more than both the fear-of-losing-face group ($M = 73.46$, $SD = 15.21$) and control group ($M = 63.96$, $SD = 20.05$), with no significant difference between the latter two. In anonymous conditions, no significant differences emerged among the three groups.

Figure 3: Interaction Between Face Consciousness Activation Type and Others' Presence in Public Goods Dilemma ($M \pm SE$)

Experiment 4 used task manipulation to investigate how different types of face consciousness affect cooperation in public goods dilemmas and how others' presence moderates this relationship. Results show that the desire to gain face not only promotes cooperative behavior but also yields higher cooperation levels in public conditions. These findings replicate Experiment 3 at the state level, demonstrating that different face consciousness types differentially affect cooperation: the desire to gain face better promotes cooperation, and this effect is stronger in public conditions. Hypotheses 2 and 4 are supported.

Across four experiments, we found that face consciousness has a facilitative effect on cooperative behavior, but this effect is influenced by multiple factors: the benefit frame of the cooperative situation, the presence of others, and the type of face consciousness. This study provides new perspectives and empirical support for understanding how face consciousness influences cooperation.

General Discussion

6.1 The Effect of Face Consciousness Level on Cooperative Behavior: Face-Conscious Individuals Are More Cooperative

Does being face-conscious promote cooperation? Experiment 1 found that face consciousness affected cooperation differently across situations: high face consciousness promoted cooperation in public goods dilemmas but not in common resource dilemmas. This result partially supports Hypothesis 1.

Why does face consciousness affect cooperation differently across situations? This may relate to framing effects produced by different social dilemmas (Andreoni, 1995; Sonnemans, 1998). The public goods dilemma uses a "give" resource frame, focusing on individual contribution rates. Face-conscious individuals perform more benevolent acts to maintain face, such as actively purchasing clean energy products (Zhao et al., 2022) and engaging in more charitable behavior (Xie & Shi, 2022). These "contribution" behaviors help individuals enhance their reputation and gain face. The common resource dilemma uses a "take" resource frame, focusing on individual withdrawal rates. In Chinese face culture, having face requires abundant social resources and high social status—what I have that you don't—so face-conscious individuals may desire to possess more resources than others (Wang et al., 2022; Li et al., 2022). However, they may also fear negative evaluation for taking too much, creating a conflicted mindset that leads to inconsistent withdrawal behavior. These results show that the relationship between face consciousness and cooperation is not simple. Although previous research suggests face-conscious individuals have modest, cooperative traits, this study finds such traits may be influenced by the benefit frame of the cooperative situation. "Giving" better demonstrates generosity, and since generous behavior has social interactive properties (Thielmann et al., 2020), in multi-round interactions, individuals' generous behavior can elicit more generous responses from group members, creating positive within-group reinforcement.

6.2 The Effect of Face Consciousness Type on Cooperative Behavior: Desire to Gain Face Promotes More Cooperation

Which type of face consciousness better promotes cooperation? Experiments 3 and 4 found that face consciousness type significantly affected cooperation in public goods dilemmas at both trait and state levels. Individuals high in desire-to-gain-face showed significantly higher cooperation than those high in fear-of-losing-face, and state activation of different face consciousness types produced similar results. These findings support Hypothesis 2, indicating that the desire to gain face better promotes cooperation than fear of losing face.

Two reasons may explain why desire-to-gain-face individuals are more cooperative. First, they crave positive evaluation from others. Contributing to the team yields good evaluations, and in collectivist cultures, cooperators typically receive higher social evaluations and better reputations (戴万亮等, 2022; Huang et

al., 2008; Wu & Van Lange, 2016). Second, desire-to-gain-face individuals also crave greater achievement (Hu, 1944). In public goods dilemmas, cooperation is the optimal choice for maximizing collective benefits in the long term. Since this study used a multi-round game paradigm, individuals consider not only immediate but also future rounds' total benefits. Reducing investment to free-ride risks two outcomes: either the group fails to reach the doubling threshold, resulting in zero earnings for all, or overall group earnings drastically decrease. Both scenarios cause teammate dissatisfaction, meaning "taking advantage of teammates" carries dual risks to both profit and morality. Increasing personal investment risks being exploited but poses no moral or reputational threat, and in the long term helps the team achieve mutual benefit—a more face-enhancing choice for both self and group.

Why do fear-of-losing-face individuals show lower cooperation? First, fear of losing face triggers anxiety, leading them to adopt avoidance tendencies in group activities to prevent failure (Tang et al., 2022; Begley & Tan, 2001). Public goods dilemmas contain uncertainties like free-riding, meaning high investors risk greater losses. For fear-of-losing-face individuals, more investment means greater potential loss and face-threatening failure, so they adopt conservative cooperation strategies. Second, since face comes from external evaluation, fear-of-losing-face individuals in interpersonal interactions (especially conflicts) worry about face loss and adopt defensive strategies to avoid it (梁凤华, 段锦云,2018; Lau & Wong, 2008). In multi-round games, the strategy of neither investing too much nor too little may become their coping mechanism. Based on these findings, desire-to-gain-face and fear-of-losing-face consciousness have different effects on cooperation. In Chinese culture, desire-to-gain-face individuals are more likely to use cooperation to satisfy their needs for positive evaluation and achievement. Therefore, an effective path for future cooperation cultivation is to enhance cooperators' public image and social praise, emphasize cooperation's value in long-term relationships and interactions, and awaken individuals' desire to gain face.

6.3 The Moderating Role of Others' Presence: Face Matters When Observed

Experiment 2 found that others' presence significantly moderated the effect of face consciousness level on cooperation in public goods dilemmas: high face consciousness individuals invested significantly more than low face consciousness individuals in public but not anonymous conditions, supporting Hypothesis 3. Experiments 3 and 4 found that others' presence also significantly moderated the effect of face consciousness type: desire-to-gain-face individuals invested significantly more than fear-of-losing-face individuals in public but not anonymous conditions, supporting Hypothesis 4.

These results indicate that public conditions effectively promote cooperation among face-conscious individuals compared to anonymous conditions. The reason may be that face-conscious individuals care more about self-image recogni-

tion and good social reputation, so when others are present, they worry about negative evaluation and reputation damage, leading them to exhibit more normative and expected behaviors (于春玲等, 2019; Li & Zhao, 2019).

From the perspective of face type, the desire-to-gain-face group invested significantly more than the fear-of-losing-face group in public but not anonymous conditions. Several reasons may explain this. First, fear-of-losing-face individuals fear exposing their weaknesses in cooperation (戴万亮等, 2022), so when others are present, their cooperative behavior may become more conservative and cautious. Desire-to-gain-face individuals lack this concern and are more likely to cooperate in public. Second, cooperation as a special interpersonal interaction mode means that in public conditions, individuals' behavior in groups is subject to others' evaluation. For desire-to-gain-face individuals, this is an opportunity to showcase themselves—cooperation can both maintain existing face and gain more face. For fear-of-losing-face individuals, others' presence creates greater interpersonal or situational pressure, intensifying their conflicted mindset and making cooperative behavior more unstable.

6.4 Limitations and Future Directions

From a cultural perspective, this study explored the influence of "face" on cooperation at the individual level, examining not only the relationships between face consciousness level and type with cooperative behavior but also the boundary conditions of face consciousness's facilitative function. These studies reveal the functions of different face consciousness types in cooperative interactions and suggest how to effectively harness the facilitative role of desire-to-gain-face consciousness in future social contexts. Despite providing new perspectives for cooperation research, several limitations remain.

First, this study's participants were primarily university students, with a narrow age range and predominantly Han ethnicity. As a complex social culture, face has different characteristics across ethnic groups (郑丽妍, 2019). Future research should expand the participant pool to examine how face consciousness differs across ages and social groups and how these differences affect cooperation.

Second, this study focused on social face consciousness—the face granted by social groups that meets social requirements. However, face also includes moral face, which involves internal self-regulation. Future research could investigate how social face and moral face differentially influence cooperation.

Finally, this study preliminarily explored the moderating roles of social dilemma type and others' presence in the relationship between face consciousness and cooperation, identifying boundary conditions. However, the mechanisms through which face consciousness influences cooperation remain unclear. Future research could introduce mediating variables or conduct qualitative interviews about motivational and process factors to reveal the internal relationships and mechanisms between face consciousness and cooperative behavior.

Conclusions

1. The relationship between face consciousness level and cooperative behavior is influenced by situational benefit frames. In public goods dilemmas, the facilitative effect of high face consciousness on cooperation is more significant, while in common resource dilemmas, this effect is not evident.
2. Face consciousness level interacts with others' presence. In public conditions, high face consciousness individuals show significantly higher cooperation in public goods dilemmas than low face consciousness individuals; in anonymous conditions, no significant difference emerges.
3. Different types of face consciousness differentially affect cooperation in public goods dilemmas. Compared to the fear-of-losing-face group, desire-to-gain-face individuals invest more and show higher cooperation levels.
4. Face consciousness type interacts with others' presence. In public conditions, desire-to-gain-face individuals show significantly higher cooperation than fear-of-losing-face individuals; in anonymous conditions, no significant difference emerges.

These findings demonstrate that the facilitative effect of face consciousness on cooperative behavior is influenced by situational features such as "give/take" and "public/anonymous," as well as by different types of face consciousness.

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Appendices

Appendix 1: Face Consciousness Questionnaire

1. I hope everyone thinks I can do things that ordinary people cannot do
2. I hope to say things in conversation that others don't know
3. I hope to own things that ordinary people don't have but desire
4. I care a lot about others' praise and compliments
5. I really want everyone to know that I know some important people
6. I hope that in others' eyes, I live better than most people
7. When talking about my weaknesses, I always hope to change the subject
8. Even if I really don't understand, I try hard to avoid letting others think I'm ignorant
9. I try my best to hide my flaws from others
10. If my school/work unit is not good, I will try not to mention it to others
11. Even if I'm wrong, I won't admit it to others face-to-face

Appendix 2: Fear-of-Losing-Face Activation Materials

Hello student, welcome to this course experiment. Please read the following materials and complete the tasks.

Material 1: Face is an important component of Chinese social culture. Face can be understood as how people interact with each other and thus creates the question of "how others see me." In life, we sometimes do things to prevent losing face. Please recall something you have done to prevent losing face. Please write at least one example.

Example: I declined the invitation to the school sports meet running competition because I was afraid of finishing last—that would be too embarrassing.

Material 2: Next, please read the following scenario and imagine it happening to you:

In class, the teacher invites you to a knowledge competition. You are very unfamiliar with this field and will definitely lose. You're considering how to decline.

Right now, your fear of losing face by participating in the competition is (higher scores indicate stronger fear of losing face). Please check the corresponding value.

Appendix 3: Desire-to-Gain-Face Activation Materials

Hello student, welcome to this course experiment. Please read the following materials and complete the tasks.

Material 1: Face is an important component of Chinese social culture. Face can be understood as how people interact with each other and thus creates the question of "how others see me." In life, we sometimes maintain self-image by gaining face. Please recall something you have done to gain face. Please write at least one example.

Example: To get a good ranking at the school sports meet, I trained every day.

Material 2: Next, please read the following scenario and imagine it happening to you:

In class, you just saw your exam score was unsatisfactory and felt discouraged. The teacher then invites everyone to a knowledge competition in a field you're familiar with and can definitely win. You're considering whether to participate.

Right now, your desire to gain face by participating in the competition is (higher scores indicate stronger desire to gain face). Please check the corresponding value.

Appendix 4: Control Group Materials

Hello student, welcome to this course experiment. Please read the following materials and complete the tasks.

Please recall your daily schedule for the past two days and write it down.

Next, please read the following passage:

Hainan Island is praised by biologists as a natural "species gene bank" and the largest "natural museum." It is known as the "Kingdom of Southern Medicine." Hainan's wild rice, small-grain rice, wild lychee, wild tea, red-shell pine, and other wild species are invaluable important wealth for scientific research and production. 102 rare animal species including the black-crested gibbon and Hainan Eld's deer are listed as national first- and second-class protected animals.

Right now, your fear of losing face is (higher scores indicate stronger fear of losing face)

Right now, your desire to gain face is (higher scores indicate stronger desire to gain face)

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