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The Impact of Regional Differences Between Northern and Southern China on Preferences for Cooperative Behavior: Evidence from a Public Goods Experiment

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Abstract. This study employs public goods and trust game experiments to investigate the influence of cultural differences between Northern and Southern China on cooperative behavior. A total of 240 participants were recruited to engage in three experimental scenarios: the baseline condition (with concealed cultural identity), the revealed condition (with disclosed identity), and the selection condition (with autonomous group formation). The design incorporates a dynamic cultural identity and a refined reward-punishment mechanism. Empirical findings reveal that: (1) Participants from the collectivist southern culture demonstrate significantly higher contributions to public goods (mean = 6.961, $p < 0.01$) compared to those from the individualist northern culture (mean = 5.923, $p < 0.01$), and they also return more in the trust game; (2) Cultural homogeneity significantly enhances cooperation levels, though the underlying mechanisms differ by region: in southern groups, cooperative behavior is indirectly promoted through the mediating effect of belief in cooperation (i.e., expected trust), whereas in northern groups, it is directly driven by cultural identity; (3) The effects of intervention mechanisms are differentiated: the identity disclosure mechanism increases cooperation among southerners by 20.83%, while the self-selection mechanism is more effective for northerners, boosting cooperation by 15.66%; (4) Partner selection exhibits systematic preferences: 61.5% of southerners prefer to cooperate with culturally similar individuals, whereas 52.08% of northerners favor cross-cultural cooperation. Notably, both groups tend to rationally select southern partners, given their higher marginal contributions (0.456 > 0.315). The study elucidates how cultural values influence cooperative behavior through dynamic identity recognition, offering theoretical foundations and empirical evidence for the design of cross-cultural cooperation policies.

Keywords: Public Goods Experiment, Cultural Differences, Cooperative Behavior Preferences

1. Introduction

Individual cooperative behavior is significantly influenced by cultural background. Due to differences in history, geography, and agricultural patterns, Northern and Southern China have developed distinct cultural orientations: the South, influenced by Confucian culture, exhibits a

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collectivist tendency that emphasizes group responsibility and fosters high contribution rates in public goods games[1]; conversely, the North, shaped by factors such as the integration of ethnic minorities, is characterized by more individualistic traits, emphasizing autonomous decision-making and tending toward self-interest maximization. These cultural differences profoundly shape social trust and cooperative motivation, necessitating empirical research to analyze their impact on public goods dilemmas. Moreover, studies of trust games further indicate that cultural identity is a crucial determinant of cooperation decisions[2]. However, existing literature largely focuses on static cultural attributes and overlooks the moderating role of identity recognition in dynamic contexts[3].

This study adopts an experimental economics approach using public goods games to address two core questions: (1) how do cultural backgrounds from Northern and Southern China influence individual cooperation preferences; and (2) what is the mechanism by which dynamic cultural identity operates in cross-cultural interactions? By designing three experimental conditions—baseline, identity disclosure, and self-selection—combined with a refined reward and punishment system, the study aims to reveal patterns of cooperative behavior shaped by cultural differences and provide theoretical and empirical support for optimizing social cooperation systems.

2. Experimental design

2.1. Public goods game experiment

2.1.1. Baseline experimental condition

Each participant starts with 10 experimental tokens as an initial endowment. Their task is to allocate a portion of these tokens to a public account while retaining the remainder for themselves. In each round of the experiment, participants are paired in groups of two and simultaneously decide on their contribution levels. Each participant chooses to contribute between 0 and 10 tokens to the public account. The total tokens in the public account are then doubled and evenly distributed among group members.

Each participant's experimental earnings equal the tokens they retain plus the share of the public account's returns[4]. For example, if participant A contributes 5 tokens and participant B contributes 5 tokens, the public account accumulates 10 tokens. The total return is $10 \times 2 = 20$ tokens, which is then equally divided among the two group members, granting each $20 \div 2 = 10$ tokens. Therefore, participant A's total earnings amount to $(10 - 5) + 10 = 15$ tokens.

Before each contribution decision, participants are required to predict how many tokens their group partner will contribute. If the prediction is accurate, they receive an additional token reward, with the amount of the reward decreasing according to the precision of the prediction[5]. This incentive mechanism is introduced in the round to encourage participants to fully consider the "free-rider" problem inherent in public goods games and to optimize their contribution strategies in subsequent rounds, thereby enhancing the overall interactivity and engagement of the game.

2.1.2. Identity disclosure experimental condition

In this phase, participants can clearly see their own and their group members' cultural identities (Southern or Northern). Both the decision-making interface and the earnings display prominently highlight the cultural information of the participants and their partners, enabling participants to subconsciously accumulate knowledge about the behavioral patterns of group members from

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different cultural backgrounds and form expectations regarding cooperation willingness and contribution patterns.

The rest of the decision-making process remains consistent with the baseline experiment. Participants decide their contributions to the public account based on their judgment while taking into account the influence of the partner's cultural background on cooperation.

2.1.3. Self-selection experimental condition

Before each round of the public goods game begins, participants are allowed to choose whether to join a “homogeneous cultural group” or a “mixed cultural group.” After selections are made, the system matches participants into groups according to their preferences, with the vast majority able to join their chosen group.

2.2. Trust game experiment

The trust game experiment is conducted after the public goods experiment for each group. It involves decisions by the trustor and the trustee, allowing observation of changes in participants’ cooperative behavior.

2.2.1. Stage one (trustor’s decision)

Two participants form a group, with one acting as the trustor and the other as the trustee. The trustor receives 10 experimental tokens and decides how many tokens (0–10) to transfer to the trustee. All transferred tokens are tripled. For example, if the trustor chooses to transfer 5 tokens, the trustee receives 15 tokens.

2.2.2. Stage two (trustee’s decision)

After receiving the tripled tokens, the trustee decides how many tokens to return to the trustor. The amount returned is at the trustee’s discretion, with no upper limit.

The experiment includes three conditions: homogeneous cultural groups (Southern-Southern or Northern-Northern pairs), mixed cultural groups (Southern-Northern pairs), and a cultural identity unknown group (with concealed cultural identities).

This experiment aims to observe differences between Northern and Southern participants in the trust game, specifically, whether the trustee's decision on the amount returned is influenced by the trustor's cultural background.

2.3. Reward and punishment mechanisms

2.3.1. Reward mechanism

High Contribution Reward: After each round of the public goods game, participants who contribute 7 or more tokens in that round receive an additional reward of 10 tokens.

Prediction Reward: Before each round of the public goods game, participants are required to predict the contribution levels of their group members. Those with accurate predictions receive extra token rewards. The reward criteria are detailed in the following table:

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Table 1. Specific reward amounts in the reward mechanism

Difference Between Predicted and Actual Contribution (Tokens)	Reward Amount (Tokens)
0 (Exact Prediction)	10
1	8
2	6
3	4
4	2
>4	0

2.3.2. Punishment mechanism

Low Contribution Punishment: After each round of the public goods game, participants whose contributions fall below the average contribution of the other group members are defined as low contributors. Once identified as a low contributor, the participant is penalized by a deduction of 3 tokens. If a participant contributes fewer than 1 token, the penalty increases to 5 tokens. At the end of each round, all group members anonymously vote on whether to impose the penalty on the low contributor. If more than half of the votes support punishment, the mechanism is implemented[6].

Non-Cooperation Punishment: In the trust game, if the trustee returns fewer than 30% of the tokens received to the trustor, then in subsequent rounds the trustee will be forced to cooperate with new partners and will be prevented from cooperating with trustors who previously exhibited high levels of trust.

The reward and punishment mechanisms are designed to promote positive interactions among participants and enhance overall cooperation efficiency.

2.4. Field experiment procedure

Step 1: Determination of Cultural Identity and Grouping. The experiment considers both participants' birthplace and upbringing environment. Only when both the birthplace and the place of upbringing are located in either the South or the North is a participant classified as Southern or Northern. This classification criterion aims to ensure the accuracy of cultural identity, thereby guaranteeing the reliability of experimental results. According to this standard, all participants are divided into 120 groups, each consisting of two participants.

Step 2: Public Goods Game Experiment. Each participant completes the baseline, identity disclosure, and self-selection experimental conditions at different stages. After each round, an anonymous contribution prediction phase is conducted. The first two sessions consist of the baseline and identity disclosure conditions, while the last two sessions consist of the identity disclosure and self-selection conditions.

Step 3: Trust Game Experiment. Trustors and trustees are randomly paired to complete transfer and return decisions.

Step 4: Reward and Punishment Mechanisms. After each round, contributions and earnings are recorded, followed by the implementation of rewards and punishments. Based on each participant's final token count and performance, cash rewards or deductions are issued. Group members may vote to punish low contributors.

Step 5: Data Collection and Analysis. After the experiment, all participants' decision data and voting results are collected for subsequent analysis of cultural differences and cooperation

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mechanisms.

3. Model construction and data analysis

Table 2. Variable definitions

Variable Type	Variable Name	Variable Description
Dependent Variable	Cooperative Behavior	Token contribution amount in the public goods experiment
Independent Variables	Cultural Identity	Southern = 1, Northern = 0
	Cultural Homogeneity	Homogeneous culture = 1, heterogeneous = 0
	Cooperative Belief	Return ratio in the trust game experiment
	Mechanism Type	Disclosure/Self-selection mechanism = 1, Baseline = 0
	Mechanism Type × Cultural Identity	
	Mechanism × Cultural Homogeneity	
Control Variables	Grade Level	Freshman = 1, Sophomore = 2, Junior = 3, Senior = 4
	Gender	Male = 1, Female = 2

3.1. Regression analysis of the baseline experimental condition — who prefers cooperation more?

3.1.1. Variable selection

The study analyzes the demographic characteristics of the participants, with variables set as shown in Table 2. Cooperative behavior is selected as the dependent variable in the model. Independent variables include participants' grade level, gender, whether they major in business, party membership status, whether they hold student leadership positions, prior participation in public goods or trust game experiments, risk attitudes, household registration type, and religious beliefs[7]. Additionally, participants' cultural homogeneity and cooperative beliefs are incorporated as independent variables in the model.

3.1.2. Model selection

Multilevel Regression Model

1) Model Objective: Using multilevel regression, control variables are introduced stepwise to examine whether the effect of Southern versus Northern cultural identity on cooperative behavior remains significant after accounting for these controls.

2) Data Analysis Procedure

Model 1:

$$Y_{\text{Cooperative Behavior}} = \beta_0 + \beta_1 \cdot X_{1\ \text{Cultural Homogeneity}} + \varepsilon$$

Model 2:

$$Y_{\text{Cooperative Behavior}} = \beta_0 + \beta_1 \cdot X_{1\ \text{Cultural Homogeneity}} + \beta_2 \cdot X_{2\ \text{Grade Level}} + \beta_3 \cdot X_{3\ \text{Gender}} + \varepsilon$$

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Model 3:

$$Y_{\text{Cooperative Behavior}} = \beta_0 + \beta_1 \cdot X_{1\ \text{Cultural Homogeneity}} + \beta_2 \cdot X_{2\ \text{Cooperative Belief}} + \varepsilon$$

Model 4:

$$Y_{CooperativeBehavior} = \beta_0 + \beta_1 \cdot X_{1CulturalHomogeneity} + \beta_2 \cdot X_{2CooperativeBelief}$$

$$+\beta_3 \cdot X_{3GradeLevel} + \beta_4 \cdot X_{4Gender} + \varepsilon$$

3.2. Identity disclosure experimental condition

3.2.1. Variable selection

Cultural homogeneity is introduced as an independent variable. A culturally homogeneous group refers to a pair of participants within the same group who share the same cultural identity, i.e., both are from either the South or the North. Existing research shows that when participants are explicitly aware of their group members' cultural identities, they tend to cooperate more with culturally similar groups[5]. This phenomenon vividly reflects the core tenet of social identity theory: individuals exhibit stronger trust and willingness to cooperate with those from the same cultural background.

3.2.2. Model construction

Similar to the identity disclosure experimental condition, the multilevel regression analysis separately examines Southern and Northern participants. At each step, the original variable indicating Southern or Northern identity is replaced with cultural homogeneity as an independent variable to explore the combined effects of cultural homogeneity and cooperative belief on cooperative behavior.

3.3. Regression analysis of the effects of identity disclosure and self-selection mechanisms on cooperative behavior

3.3.1. Variable selection

The variables "identity disclosure/self-selection mechanism," "Southern/Northern identity," and "cultural homogeneity," along with interaction terms such as "mechanism × Southern/Northern identity" and "mechanism × cultural homogeneity," are selected to analyze how Southern identity moderates the effect of the mechanisms and how cultural homogeneity influences the mechanism's effect. Additionally, control variables such as grade level, gender, and other demographic characteristics are included.

3.3.2. Model construction

Multilevel Regression Model: Assessing the Impact of Identity Disclosure and Self-Selection Mechanisms

1) Model Objective: To examine how participants' group selection after self-selection, cultural homogeneity, and cooperative belief jointly influence cooperative behavior.

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2) Data Analysis Procedure:
Model 1:

$$Y_{\text{Cooperative Behavior}} = \beta_0 + \beta_1 \cdot X_{1\ \text{Mechanism Type}} + \beta_2 \cdot X_{2\ \text{Cultural Homogeneity}} + \beta_3 \cdot X_{3\ \text{Cultural Identity}} + \varepsilon$$

Model 2:

$$Y_{CooperativeBehavior} = \beta_0 + \beta_1 \cdot X_{1MechanismType} + \beta_2 \cdot X_{2CulturalHomogeneity}$$

$$+\beta_3 \cdot X_{3MechanismType \times CulturalIdentity} + \varepsilon$$

Model 3:

$$Y_{CooperativeBehavior} = \beta_0 + \beta_1 \cdot X_{1MechanismType} + \beta_2 \cdot X_{2CulturalHomogeneity}$$

$$+\beta_3 \cdot X_{3Mechanism \times CulturalHomogeneity} + \varepsilon$$

4. Empirical results analysis

4.1. Differences in cooperative behavior between southern and northern participants in the public goods experiment

The measure of cooperative behavior is the actual amount contributed by individuals in the public goods experiment, while cooperative belief is measured by the amount participants are willing to allocate to the other party as either trustor or trustee in the trust game experiment. Figure 1 presents the mean values of cooperative behavior and cooperative belief for Southern and Northern participants in the baseline experimental condition.

As shown in Figure 1, the average public goods contribution of Southern participants is 6.961, which is 1.038 higher than that of Northern participants. Both the Mann–Whitney U test and t-test confirm that this difference is statistically significant at the 1% level (p = 0.000 and 0.002, respectively). This indicates that Southern participants tend to exhibit a stronger preference for cooperative behavior compared to their Northern counterparts. In the trust game experiment, Southern participants' mean contribution is 6.530, slightly higher than the Northern participants' 0.191 difference. However, neither the Mann–Whitney U test nor the t-test confirm this difference as significant at the 1% level (p = 0.051 and 0.027, respectively). This suggests that there is no substantial difference between Southern and Northern participants regarding cooperative belief.

In summary, Southern participants appear more inclined towards cooperation (Conclusion 1), whereas Northern participants tend to act more independently, exhibiting a lower preference for cooperative behavior.

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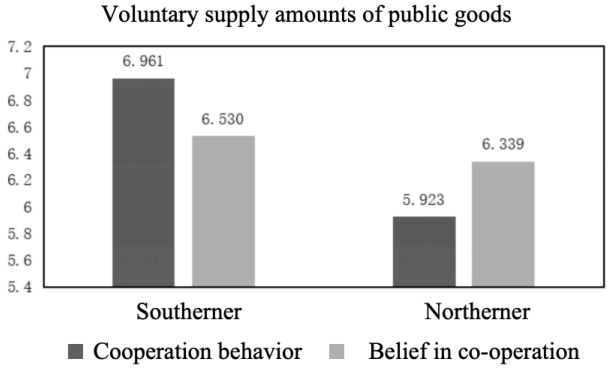

Figure 1. Mean cooperative behavior and cooperative belief of southern and northern participants in the baseline experimental condition

Table 3 further corroborates the main conclusions presented in Figure 1. This study employs the Tobit regression model to examine the relationships among cooperative behavior and related variables. As shown in columns (1) through (4), the cultural identity variable representing Southern participants consistently exhibits a highly significant positive coefficient ($p < 0.01$), with values of 1.512, 1.407, 1.104, and 0.986 respectively. This indicates that regardless of whether control variables are included, Southern identity exerts a significant positive effect on contributions to the public good. Therefore, in the baseline experimental condition, Southern participants demonstrate a stronger preference for cooperation compared to their Northern counterparts.

Meanwhile, the results in columns (5) and (6) show that although the coefficient of cooperative belief for Southern participants is positive, it does not achieve significance at the 1% level. This suggests that the observed differences in cooperative behavior between Southern and Northern participants stem from inherent behavioral preferences associated with cultural identity and that cooperative belief does not serve as a mediating variable influencing cooperative behavior.

Table 3: Tobit regression results for the baseline experimental condition

Table 3. Tobit regression results for the baseline experimental condition

	(1) Cooperative Behavior	(2) Cooperative Behavior	(3) Cooperative Behavior	(4) Cooperative Behavior	(5) Cooperative Belief	(6) Cooperative Belief
Cultural Identity (Southern)	1.512***	1.407***	1.104***	0.986***	0.135*	0.082
Standard Error	0.312	0.308	0.299	0.291	0.08	0.079
Cooperative Belief			0.872***	0.841***		
Standard Error			0.092	0.089		
Control Variables Included	No	Yes	No	Yes	No	Yes
Number of Observations	1200	1200	1200	1200	1200	1200
Pseudo R^2	0.0041	0.0165	0.0852	0.1068	0.0006	0.0047
Left/Right Censoring Counts	245/12	245/12	245/12	245/12	175/9	175/9

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Note: p <0.01=***， p <0.05=**， p <0.1=*.

4.2. Exploration of whether cultural homogeneity promotes cooperative behavior among different cultural groups

Figure 2 illustrates the mean voluntary contribution amounts in the public goods experiment across different cultural groups. Regarding cooperative behavior, for participants identified as Southerners, when their cooperative partners were also Southerners, the mean contribution reached 8.816, significantly higher than the 6.691 mean contribution observed in the baseline experimental setting. Conversely, when cooperating with Northerners, their mean contribution dropped to 5.327. For participants identified as Northerners, the mean contribution was 6.782 when paired with fellow Northerners, slightly exceeding the baseline mean of 5.923. However, their mean contribution was only 5.553 when paired with Southerners. These findings indicate that both Southerners and Northerners exhibit a stronger willingness to cooperate within culturally homogeneous groups. Figure 3 demonstrates that both Southerners and Northerners also hold higher cooperative beliefs toward members of their own cultural groups.

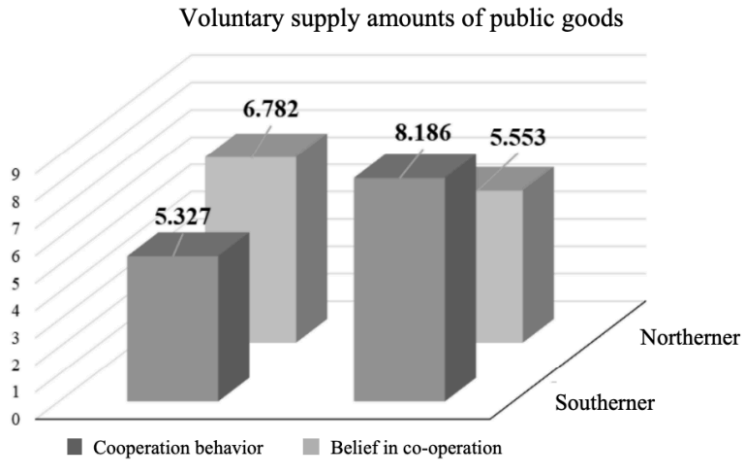

Figure 2. Cooperative behavior of different cultural groups in the disclosure experimental condition

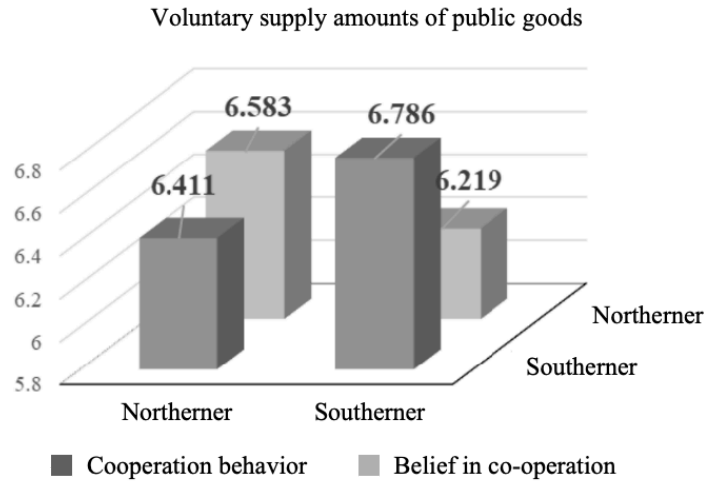

Figure 3. Cooperative beliefs of different cultural groups in the disclosure experimental condition

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Table 4 presents the regression results of cooperative behavior and cooperative beliefs for Southern participants in the disclosure experimental condition.

In models (1) and (2), which do not include cooperative beliefs, the cultural homogeneity variable remains significantly positive, with coefficients of 3.214 and 3.057 respectively, both significant at the 1% level. After introducing the cooperative belief variable in models (3) and (4), the regression coefficients for cultural homogeneity noticeably decrease to 2.213 and 2.127, yet remain significant at the 1% level. This indicates that Southern participants place great importance on whether the cooperative context involves members of the same cultural group; cultural homogeneity significantly influences their voluntary contributions to public goods. Meanwhile, cooperative beliefs continue to exert a significant effect on cooperative behavior, suggesting that cultural homogeneity affects cooperative beliefs. Furthermore, the regression results in models (5) and (6) show that Southern participants tend to adopt a more positive cooperative attitude when their cooperation partners are also from the South.

Table 4. Regression results of cooperative behavior and cooperative beliefs among southern participants in the disclosure experiment condition

	(1) Cooperative Behavior	(2) Cooperative Behavior	(3) Cooperative Behavior	(4) Cooperative Behavior	(5) Cooperative Belief (Rounds 1-10)	(6) Cooperative Belief (Rounds 2-10)
Cultural Homogeneity	3.214***	3.057***	2.213***	2.127***	2.436***	2.312***
	0.512	0.498	0.462	0.456	0.42	0.412
Cooperative Belief			1.212***	1.189***		
			0.082	0.079		
Lagged Group Member Contribution (t-1)						0.385***
						0.065
Control Variables Included	No	Yes	No	Yes	Yes	Yes
Number of Observations	1200	1200	1200	1200	1200	1080
Pseudo R^2	0.0055	0.0343	0.1027	0.1358	0.0229	0.0471
Left/Right Censoring Counts	255/14	255/14	255/14	255/14	176/9	158/7

Table 5 presents the regression results of cooperative behavior and cooperative beliefs among Northern participants in the disclosure experiment.

In models (1) and (2) without the inclusion of cooperative belief, the cultural homogeneity variable consistently shows a positive coefficient of 1.946 and 1.247, respectively; however, these coefficients do not reach statistical significance at the 1% level. After introducing cooperative belief in models (3) and (4), the regression coefficients for cultural homogeneity decrease slightly to 1.946 and 1.247, yet still fail to achieve significance at the 1% level. This indicates that Northern participants are relatively indifferent to whether the cooperative context involves culturally homogeneous groups, and cultural homogeneity does not significantly affect their voluntary public goods contributions. Meanwhile, cooperative belief remains a significant predictor of cooperative

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behavior, suggesting that cultural homogeneity does not influence Northern participants' cooperative beliefs, implying that they do not perceive differences in others' cooperative attitudes based on cultural group membership.

Columns (5) and (6) of Table 5 further demonstrate that the effect of cultural homogeneity on Northern participants' cooperative belief is statistically insignificant. When lagged group member contributions are included as an experiential variable, there is a positive but non-significant effect on cooperative belief prediction. This suggests that Northern participants do not adjust their cooperative behavior or beliefs based on the cultural background of their partners.

Comparing the cultural homogeneity coefficients between Tables 4 and 5 reveals that culturally homogeneous groups exhibit significantly higher cooperative behavior compared to culturally diverse groups. Northern participants show no significant differences in cooperative belief between culturally homogeneous and diverse groups, whereas Southern participants demonstrate significantly higher cooperative belief within culturally homogeneous groups. Moreover, cultural homogeneity indirectly promotes cooperative behavior among Southerners by enhancing cooperative belief. Therefore, the variation in Northern participants' cooperative behavior is primarily driven directly by cultural identity, while for Southern participants, it depends on the combined effects of identity recognition and cooperative belief. This reflects the heterogeneity in cooperation mechanisms across different cultural groups.

Table 5. Regression results for northern participants' cooperative behavior and cooperative belief in the disclosure experiment

	(1) Cooperative Behavior	(2) Cooperative Behavior	(3) Cooperative Behavior	(4) Cooperative Behavior	(5) Cooperative Belief (Rounds 1–10)	(6) Cooperative Belief (Rounds 1–10)
Cultural Homogeneity	1.946**	1.807*	1.325*	1.247	1.127*	1.042
	0.325	0.317	0.308	0.299	0.216	0.209
Cooperative Belief			0.895***	0.862***		
			0.092	0.088		
Lagged Group Member Contribution (t-1)						0.366***
						0.063
Control Variables Included	No	Yes	No	Yes	Yes	Yes
Number of Observations	1200	1200	1200	1200	1200	1080
Pseudo R^2	0.0037	0.0328	0.0947	0.1156	0.0008	0.0249
Left/Right Censoring Counts	330/11	330/11	330/11	330/11	168/9	150/8

Table 6 columns (1) and (4) further demonstrate that both the disclosure mechanism and the selection mechanism significantly enhance voluntary public goods contributions. Compared to the baseline experiment, the average voluntary contribution in the disclosure experiment is higher by 1.425 units; and in the selection mechanism, the average contribution exceeds that of the disclosure mechanism by 0.785 units. Both coefficients are statistically significant at the 1% level. The

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coefficients for the cultural homogeneity dummy variable are all positive, and the values in the latter two experiments are significantly larger than those in the former two, indicating that the disclosure mechanism promotes cooperation by revealing the identity information of group members, while the selection mechanism improves cooperation expectations by allowing individuals to freely choose their partners, thereby enhancing the overall level of cooperation. It is worth noting that in the baseline experiment, the coefficient for participants from Northern China is significantly negative, indicating a lower level of cooperation compared to participants from Southern China. However, under the disclosure and selection mechanisms, the coefficient for Northern participants becomes significantly positive, suggesting that their cooperation level exceeds that of Southern participants. This implies that the disclosure mechanism reduces Northern participants' distrust toward culturally heterogeneous groups through information transparency, and the selection mechanism enhances their cooperative confidence by allowing them to prioritize culturally similar partners—thus significantly increasing their voluntary contributions to public goods.

The regression results in columns (2) and (5) of Table 6 reveal the facilitative effects of cultural homogeneity and diversity under the disclosure and selection mechanisms. Column (2) shows that the voluntary contributions of culturally diverse groups significantly increased under the disclosure mechanism. The interaction term between the disclosure mechanism and the cultural homogeneity dummy variable is significantly positive, indicating that the increase in cooperation for culturally homogeneous groups under the disclosure mechanism is significantly greater than that for culturally diverse groups. In contrast, column (5) indicates that the coefficient for the selection mechanism dummy variable is negative but not statistically significant, suggesting no significant difference in voluntary public goods contributions for culturally diverse groups under the selection mechanism. However, the interaction term between the selection mechanism and cultural homogeneity is significantly positive, indicating that the cooperation improvement for culturally homogeneous groups under the selection mechanism is significantly greater than that for diverse groups. Therefore, both the disclosure and selection mechanisms significantly enhance voluntary public goods contributions among culturally homogeneous groups.

The regression results in columns (3) and (6) of Table 6 explore how the disclosure and selection mechanisms influence the cooperative behavior of individuals from different cultural backgrounds. Column (3) shows that the coefficient of the disclosure mechanism dummy variable is significantly positive, indicating that, compared to the baseline experiment, the disclosure mechanism significantly increased voluntary public goods contributions among southern participants. The dummy variable for southern participants is not significant. The interaction term between the disclosure mechanism and the northern participant dummy variable is significantly positive, suggesting that the difference in the effect of the disclosure mechanism on facilitating cooperation between the baseline and disclosure experiments is greater for northern participants than for southern ones.

In the selection mechanism condition, the coefficient for the selection mechanism is significantly negative, indicating that northern participants exhibited significant differences in public goods contributions between the disclosure and selection mechanisms. The coefficient for the southern participant dummy is significantly negative, suggesting that in the baseline experiment, the contribution level of northern participants was significantly lower than that of southern participants. The interaction term is significantly negative, meaning that the increase in cooperation among northern participants under the selection mechanism was significantly greater than that of southern participants. This implies that the selection mechanism had a more pronounced effect in promoting cooperation among northern participants.

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Thus, Conclusion 3 can be drawn: both the disclosure and selection mechanisms effectively enhance public cooperation. The disclosure mechanism significantly improved cooperative behavior among southern participants, whereas the selection mechanism had a significantly stronger impact on promoting cooperative behavior among northern participants. Moreover, the contribution differential between culturally homogeneous groups under the disclosure and selection mechanisms is significantly greater than that of culturally diverse groups under the same mechanisms.

Table 6. Regression results of cooperative behavior and cooperative belief in the disclosure or selection experiments

	(1) Full Sample (Baseline–Disclosure)	(2) Full Sample	(3) Full Sample	(4) Full Sample (Disclosure–Selection)	(5) Full Sample	(6) Full Samp
Disclosure/Selection Mechanism	1.425***	0.893***	1.302***	0.785***	0.042	-0.465***
	0.21	0.295	0.278	0.272	0.44	0.368
Southern	-0.678***		0.725*	0.825***		-0.887**
	0.206		0.32	0.3		0.38
Cultural Homogeneity	0.735***	0.148		2.018***	1.255***	
	0.218	0.305		0.315	-0.395	
Disclosure/Selection Mechanism × Cultural Homogeneity		1.098**			1.425**	
		0.46			0.585	
Disclosure/Selection Mechanism × Southern			1.26***			-1.052**
			0.41			0.52
Control Variables Included	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	1200	1200	1200	1200	1200	1200
Pseudo R^2	0.0591	0.0563	0.0542	0.0261	0.0246	0.022
Left/Right Censoring Counts	480/35	480/35	480/35	460/62	460/62	460/62

4.3. Differences in cooperative partner selection preferences between northern and southern groups

The Disclosure experiment and the Selection experiment differ significantly in focus. For participants, the Disclosure experiment only reveals their cultural identity and control variables, whereas, in the Selection experiment, participants must choose their preferred cooperative partner before making decisions, thus autonomously determining the cultural composition of their experimental group. This study further investigates, under the condition that Southern and Northern participants are given the right to choose, whether Northern participants tend to select Southern partners who exhibit higher cooperation levels, and whether Southern participants are more inclined to form in-group alliances.

Using data from the Selection experiment to address these questions, we find that out of 1,200 selections made by Southern participants, 738 were choices to cooperate with other Southern

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participants—accounting for 61.50%, which is significantly higher than the 50% expected under random selection, with significance at the 1% level. Conversely, Northern participants exhibited the opposite pattern: they showed a stronger preference for cooperating with culturally heterogeneous partners. The probability that Northern participants chose Southern partners was 52.08%, slightly higher than their choice of Northern partners, and this difference was also statistically significant at the 1% level. These findings indicate that Southern participants are generally more favored as cooperative partners in the selection process.

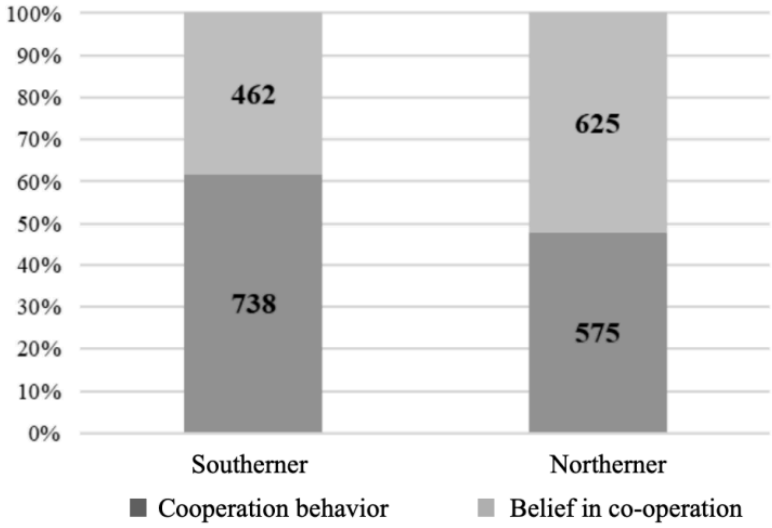

Figure 4. Frequency distribution of selected cooperative partners' cultural identities

The previous tables have already included evidence that the subjects consistently chose Southern individuals as their cooperation partners. First, data from Tables 4 and 5 show that the frequency proportion of Southern participants engaging in free-riding behavior in public goods provision (i.e., contribution amount equals zero, corresponding to the left-tail censored observations in Table 4) is 21.25% (255/1200), whereas the probability of Northern participants free-riding is 27.5% (330/1200), which is significantly higher than that of Southern participants. This indicates that Northerners exhibit a higher preference for cooperation.

However, in terms of marginal increments in contributions, the marginal increase made by Southerners is significantly higher than that of Northerners. The regression results in Table 4 indicate that for Southerners, every 0.385-unit increase in the previous round's cooperation partner's contribution raises cooperative belief by one unit. Furthermore, a one-unit increase in cooperative belief leads to a 1.189-unit increase in cooperative behavior. Therefore, a one-unit increase in the previous partner's contribution corresponds to a 0.456-unit increase in the Southern participants' cooperative behavior. Correspondingly, for Northerners, every 0.366-unit increase in the previous round partner's contribution increases cooperative belief by one unit. Each 0.862-unit increase in cooperative belief corresponds to a one-unit increase in cooperative behavior. Hence, a one-unit increase in the previous partner's contribution results in a 0.315-unit increase in the Northerners' cooperative behavior. Thus, when Southern and Northern participants freely select cooperation partners, both groups make rational decisions based on marginal contribution increments, with a preference to choose Southern individuals as cooperation partners.

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4.4. Exploring the impact of experimental mechanisms on the cooperative behavior of southern and northern participants

The study also investigates the impact of experimental mechanisms on the cooperative behavior of participants from the South and North. As shown in Figure 5, Southern and Northern participants exhibit varying degrees of difference in their public goods contributions under different experimental mechanisms.

For Southern participants, compared to the baseline experiment, the disclosure mechanism can significantly enhance their cooperative behavior. When Southern participants act as principals and their partners are Southern and Northern participants, the voluntary contribution to the public good in the baseline experiment is only 7.023 and 6.543, respectively. The increase in voluntary contributions from the baseline experiment to the disclosure experiment is 20.83% and 21.64%, respectively. For Southern participants, the increase in voluntary contributions from the disclosure experiment to the selection experiment is relatively small, rising only to 8.513 and 8.018.

For Northern participants, compared to the disclosure experiment, the selection experiment can significantly improve their cooperative behavior. When Northern participants act as principals and their partners are Northern and Southern participants, their voluntary contributions to the public good in the baseline experiment are 6.453 and 6.737, respectively. The increase in voluntary contributions from the baseline experiment to the disclosure experiment is only 8.91% and 3.25%, respectively. For Northern participants, the increase in voluntary contributions from the disclosure experiment to the selection experiment reaches 15.66% and 12.58%, respectively.

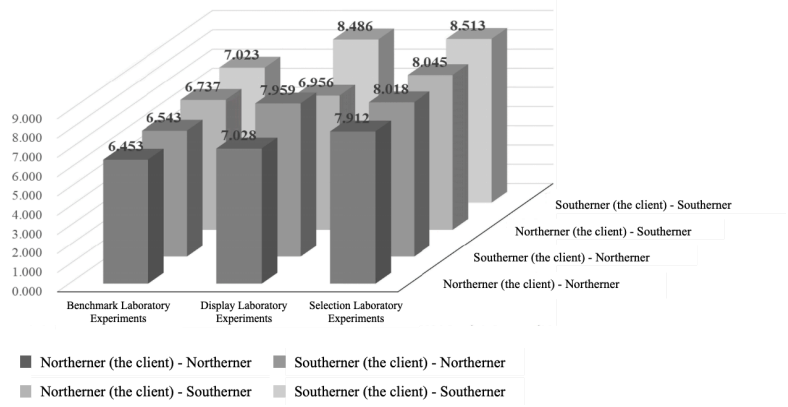

Figure 5. Illustration of voluntary contributions to public goods under different cooperative environments

Therefore, the disclosure mechanism can significantly enhance the cooperative behavior of Southern individuals because Southern culture emphasizes relationships and collectivism. Conversely, the selection mechanism can significantly improve the cooperative behavior of Northern individuals, as Northern culture places greater emphasis on individualism and independence.

5. Conclusion

This study reveals the systematic influence of cultural differences between Northern and Southern China on cooperative behavior through cross-cultural experiments, thereby expanding the theoretical framework concerning the relationship between culture and cooperation. Empirically, the study confirms that: (1) the collectivism–individualism cultural dimension has predictive validity—

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Southern groups significantly outperform Northern groups in both public goods contribution (mean 6.961 vs. 5.923, $p < 0.01$) and levels of trust; (2) Social identity theory is applicable in regional cultural contexts—cooperation efficiency among culturally homogeneous groups is significantly higher than that among heterogeneous groups; (3) The innovative "dynamic cultural identity" design reveals that individuals flexibly adjust their cooperation strategies based on contextual cultural information, supporting the core argument of cultural group selection theory that "culturally proximate groups are more likely to evolve high levels of cooperation."

Based on these findings, this paper offers the following policy implications for current economic and social development: In Northern regions, where individualistic culture predominates, priority should be given to promoting private economic development. The autonomous decision-making tendencies characteristic of this culture can be stimulated through market-oriented institutional designs, such as strengthening property rights protection and implementing tax incentives, thereby unleashing individual innovation potential. At the same time, fine-tuned reward and punishment mechanisms should be established to effectively constrain "free-riding" behaviors and compensate for deficiencies in collective action capacity. In contrast, Southern regions dominated by collectivist culture are more suited to implementing collaborative governance models between government and society. Leveraging the advantages of strong group identity (61.5% preference for cooperation within culturally similar groups) and higher public contribution levels, participatory governance can be promoted through grassroots entities such as community organizations and industry alliances, particularly in infrastructure development and ecological governance, thereby reducing public policy implementation costs. Regarding cross-regional economic integration, differentiated strategies should be implemented: the North should focus on enhancing institutional flexibility, such as promoting innovation in free trade zone policies, while the South should emphasize identity integration by advancing regional integrated co-governance mechanisms. Moreover, by designing cross-cultural reward and punishment systems—such as rewarding high-contributing enterprises and penalizing resource-wasting behaviors—the efficiency of resource allocation can be optimized, fostering dynamic integration and complementation between cultural characteristics and institutional environments.

References

[1] Quan, J. , Chu, Y. Q. , & Wang, X. J. (2020). Public goods game and cooperation evolution under voluntary participation mechanism. Journal of Systems Engineering, 35(2), 188–200.
[2] Qu, Y. (2018). The impact of cross-cultural differences on interpersonal trust and cooperative behavior [Master's thesis, Tianjin University].
[3] Macaulay, M. (2020). In search of a golden thread: Recent developments in public management across New Zealand and Australia. Public Management Review, July, 1–10.
[4] Chen, X. Y. , & Lian, H. Q. (2012). Experimental research on public goods provision and its future development. Economic Theory and Business Management, (12), 52–60.
[5] Wang, C. J. , Nie, Z. L. , & Yue, J. (2012). Individual heterogeneity, expectation, and voluntary provision of public goods: Experimental evidence from China. Finance & Trade Economics, (8), 36–45.
[6] Lian, H. Q. , & Sun, Y. F. (2023). Chaoshan and Hakka cultures from the perspective of public cooperation: Evidence from laboratory experiments. Academic Monthly, 55(3), 67–81.
[7] Lian, H. Q. , Zhou, Y. A. , Zuo, C. Y. , et al. (2013). Can punishment mechanisms truly solve the free-rider problem? Evidence from dynamic public goods experiments. Management World, (4), 69–81.