The Influence Mechanism of Narrative Information on Parochial Cooperative Behavior

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Abstract

Based on "universalism" and "parochialism," cooperative behavior can be categorized into universal cooperation (indiscriminate cooperation with both in-group and out-group members) and parochial cooperation (exhibiting higher cooperation levels with the in-group). In recent years, various anti-globalization phenomena such as "decoupling" and "grouping together" have exemplified the typical characteristics of parochial cooperation. How to abandon parochialism and promote mutually beneficial cooperation represents a crucial issue for humanity in addressing global challenges and securing long-term welfare. Accordingly, the present study employs the classic public goods game paradigm and investigates the impact of narrative information on parochial cooperation behavior and its underlying mechanisms through three experiments. The findings reveal that: (1) viewpoint-related narrative information is more effective than event-related narrative information in reducing parochial cooperation behavior; (2) perceived similarity fully mediates the relationship between narrative information and strong parochial cooperation behavior; (3) intergroup relations moderate the relationship between narrative information and both parochial and strong parochial cooperation behavior, with viewpoint-related narrative information paradoxically increasing levels of parochial and strong parochial cooperation under competitive intergroup relations. This study explores feasible pathways to promote intergroup cooperation from the perspective of daily social information exchange, offering implications for fostering the construction of a community with a shared future for mankind.

Full Text

The Mechanism of Narrative Information's Influence on Parochial Cooperative Behavior (Submission to the Prosocial Behavior Special Issue)

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Abstract

Based on the distinction between "universalism" and "parochialism," cooperative behavior can be categorized into universal cooperation (indiscriminate cooperation with both in-group and out-group members) and parochial cooperation (higher cooperation levels with in-group members). Recent anti-globalization events such as various forms of "decoupling" and "grouping together" exemplify the typical characteristics of parochial cooperation. How to abandon parochialism and promote win-win cooperation represents a crucial challenge for humanity in addressing global challenges and securing long-term welfare. Accordingly, this study employed the classic public goods game paradigm across three experiments to investigate how narrative information influences parochial cooperative behavior and its underlying mechanisms. The results revealed: (1) viewpoint-related narrative information was more effective than event-related narrative information in reducing parochial cooperative behavior; (2) perceived similarity fully mediated the relationship between narrative information and strong parochial cooperative behavior; and (3) intergroup relations moderated the association between narrative information and parochial (as well as strong parochial) cooperative behavior, with viewpoint-related narrative information actually increasing parochial and strong parochial cooperation levels under competitive intergroup relations. This study explores feasible pathways to promote intergroup cooperation from the perspective of daily social information exchange, offering insights for fostering the construction of a global community of shared future.

Keywords: parochial cooperative behavior, narrative information, perceived similarity, intergroup relation

Parochial cooperative behavior refers to the pervasive phenomenon of in-group preference, wherein individuals exhibit greater cooperative behavior with in-group members compared to out-group members (Aaldering et al., 2018). In recent years, events such as "Brexit" and the "U.S. withdrawal from international groups" have fueled the rise of parochialism, protectionism, and unilateralism, making international cooperation increasingly characterized by small cliques and regional blocs, with parochial cooperative behavior becoming more pronounced across nations and regions. However, excessive pursuit of in-group interests undermines efforts to address major problems requiring multi-group collaboration. Therefore, exploring the influencing factors and psychological

mechanisms of parochial cooperation holds important theoretical and practical value for enhancing intergroup cooperation and achieving mutual benefit.

Extensive research demonstrates that intergroup contact can reduce intergroup bias, improve intergroup relations (Crisp & Turner, 2009; Ng et al., 2015), and promote intergroup cooperation (Turner & West, 2012). However, constrained by practical factors such as time and space, opportunities for real, face-to-face contact with out-group members are limited. Instead, receiving narrative information through newspapers, television, radio, the internet, and other media has become the primary means and important channel for understanding out-groups. Previous studies have found that reading narrative information can effectively enhance individuals' understanding of out-groups (Dodell-Feder & Tamir, 2018; Kidd & Castano, 2013; Mar et al., 2011; Oatley, 1999a, 1999b), reduce parochial empathy (Bruneau et al., 2015; Gaesser et al., 2020; Vollberg et al., 2021), and improve intergroup prejudice (Johnson et al., 2013). Building on this foundation, the present study investigates whether and how different types of narrative information can reduce parochialism and promote intergroup cooperation.

1.1 Parochial Cooperative Behavior

Parochial cooperation, as a form of "biased" cooperation based on in-group versus out-group identity that lies between universal cooperation and refusal to cooperate, possesses two key characteristics: first, boundedness, meaning limited cooperation directed toward specific targets; and second, in-group orientation, meaning cooperation always targets in-group members, reflecting humans' evolved instinct to protect their in-group (Henrich & Muthukrishna, 2021). Numerous studies indicate that parochial cooperation is primarily driven by two motivations: in-group love and out-group hate (De Dreu et al., 2014). This distinction allows for further classification into weak parochial cooperative behavior and strong parochial cooperative behavior. Weak parochial cooperation refers to behavior driven by in-group love that benefits the in-group without affecting out-group interests (Aaldering et al., 2018; Bernhard et al., 2006)—essentially "sweeping one's own doorstep." Strong parochial cooperation, by contrast, is driven by out-group hate and involves behavior that harms out-group interests while benefiting the in-group (Böhm, 2016; Mifune et al., 2017)—essentially "benefiting oneself at others' expense." Thus, the underlying logic of parochial cooperation represents a multilevel social dilemma, involving simultaneous dilemmas both within and between groups (Dawes, 1980; Van Lange et al., 2013; De Dreu et al., 2014).

1.2 Narrative Information

Narrative information refers to information that records a series of related events or experiences through storytelling, including factual narratives that document real events or experiences (such as biographies and news reports) and fictional

narratives that describe imagined events or experiences (such as fairy tales and fables) (Labov & Waletzky, 1997; Bowes & Katz, 2015). In daily life, novels we read and films we watch are typical carriers of narrative information. Extended intergroup contact theory proposes that browsing news, books, videos, and other media about out-groups can serve as a form of intergroup contact (Liebkind & McAlister, 1999; Johnson et al., 2013). Narrative information provides more diverse and convenient pathways for intergroup contact.

Research shows that presenting individuals with others' narrative information can enhance the identifiability of those individuals and promote helping behavior directed toward them (Genevsky et al., 2013). This phenomenon, known as the "Identifiable Victim Effect" (IVE), occurs because narrative information can evoke positive emotions in individuals (Genevsky et al., 2013). Similarly, Bruneau et al.'s (2015) research on the "dilution effect" confirmed that presenting narrative information about out-group members can weaken their out-group identity and highlight their individual characteristics, thereby reducing parochial empathy. Further research found that compared to narrative information describing target objects' physical characteristics, narrative information describing their mental states made participants' empathy levels toward in-group and out-group members more consistent. In other words, compared to narrative information describing objective facts such as appearance features and life experiences, narrative information describing subjective activities such as beliefs, personality, and attitudes can significantly reduce parochial empathy. A recent study confirmed that when participants were presented with individuating information about out-group members (e.g., "his favorite animal is a monkey") rather than stereotypes about that out-group, participants' perception of out-group members shifted from the group level to the individual level, thereby reducing empathy differences between in-group and out-group members (Sharifian et al., 2021) and enhancing trust and prosocial behavior toward out-groups (Lee et al., 2021).

In summary, previous research has primarily focused on the impact of narrative information at the individual level on helping behavior and parochial empathy, without examining the prosocial effects of narrative information at the intergroup relationship level or clarifying the differential effects of different types of narrative information. Therefore, this study further distinguishes narrative information into "event-related" (describing the objective process of event occurrence) and "viewpoint-related" (describing the mental state of the story protagonist) categories, aiming to explore the effects of different types of narrative information on intergroup parochial cooperative behavior and its mechanisms. We propose Hypothesis 1: Compared to event-related narrative information, viewpoint-related narrative information can more effectively reduce parochial cooperative behavior.

1.3 Perceived Similarity, Narrative Information, and Parochial Cooperative Behavior

The reason why viewpoint-related narrative information can reduce parochial cooperative behavior may be that it elicits perceived similarity toward the target object. Perceived similarity refers to the degree of similarity that individuals perceive between themselves and others (Montoya et al., 2008). Research shows that compared to out-groups with simple thinking, individuals are more likely to perceive themselves as similar to out-groups with complex minds and tend to perceive their members as "unique individuals" rather than "group members" (Almaraz et al., 2017). Viewpoint-related narrative information precisely presents the complex mental activities of out-group members and is therefore more likely to enhance individuals' perceived similarity, highlight the perceived object's individual characteristics, and consequently reduce individuals' parochial tendencies.

Furthermore, in intergroup interactions, people often develop a sense that "those who are not of our race must have different hearts." Perceived similarity implies potential kinship (Park & Schaller, 2005), the possibility of group formation (Hehman et al., 2019), and higher out-group credibility (Koch et al., 2020). Therefore, high perceived similarity can promote trust (Singh et al., 2016), reduce dehumanization tendencies, thereby decreasing out-group prejudice and promoting intergroup cooperation (Costello & Hodson, 2010; McDonald et al., 2016). Koch et al. (2020) also confirmed that when individuals perceive similarity in beliefs with others, they exhibit more out-group cooperative behavior.

Thus, perceived similarity may be an important factor in building good intergroup relations, and different types of narrative information may affect parochial cooperative behavior by influencing perceived similarity. Based on this, while distinguishing between weak and strong parochial cooperation, this study proposes Hypothesis 2: Perceived similarity mediates the relationship between narrative information type (event-related/viewpoint-related) and parochial cooperative behavior (strong/weak).

1.4 The Moderating Role of Intergroup Relations

In real life, groups do not exist in isolation but are nested within complex intergroup relational networks. Intergroup relations refer to various connections—including cognitive, emotional, and behavioral aspects—that occur with other groups due to group membership (Zuo & Zhao, 2008). The most fundamental intergroup relations are manifested as cooperation and competition (Fu, 2005). Research shows that intergroup relations significantly influence subsequent intergroup interactions. In competitive situations, two groups easily fall into a zero-sum social dilemma, where individuals prioritize behavior decisions that benefit the in-group. However, because resources in social dilemmas are extremely limited, gains for the in-group typically accompany losses for the out-group, leading to negative attitudes and stereotypes from out-groups toward the

in-group (Dovidio et al., 2003). In contrast, cooperative experiences between groups create win-win situations that help reduce intergroup cognitive bias, increase intergroup attraction and trust, often leading to a virtuous cycle of "more cooperation, more trust; more trust, more cooperation" (Beekman et al., 2017; Gaertner et al., 1999). In other words, previous competitive experiences hinder subsequent cooperation, while previous cooperative experiences increase the probability of subsequent cooperation (Beekman et al., 2017).

In summary, this study manipulates intergroup cooperative or competitive relations based on the minimal group paradigm to observe the effects of narrative information on parochial cooperative behavior and exploratorily proposes Hypothesis 3: The effect of narrative information on parochial cooperative behavior differs under different intergroup relations (competition/cooperation). The relationships among variables across studies are illustrated in Figure 1 [Figure 1: see original paper].

2.1 Participants

Using G*Power 3.1 for sample size estimation (Faul et al., 2007), with a significance level of $\alpha = 0.05$, medium effect size ($d = 0.5$), and predicted statistical power of 80%, a minimum of 34 participants was required for a paired-samples t-test. Thirty-seven university students (15 males) were recruited, with a mean age of 18.6 ± 1.34. All participants had normal or corrected-to-normal vision, were right-handed, and had not participated in similar experiments recently. A sensitivity analysis using G*Power 3.1 with significance level $\alpha = 0.05$ and statistical power $1 - \beta = 0.8$ revealed that with a sample size of 37, the effect size was 0.42.

2.2.1 Narrative Information Materials

We translated and adapted eight narrative information materials used by Bruneau et al. (2017) and Gaesser et al. (2020), informing participants that the protagonist in each narrative was their game opponent. Each narrative consisted of either an event-related description (describing the environment or the event itself) or a viewpoint-related description (describing the individual's thoughts and attitudes about the event), with approximately equal word counts for each narrative. Specific examples are as follows:

(1) Event-related narrative material:
"In the early evening, only a few overtime workers hurried toward the bus stop on the streets of the Gongchuangxin District. Wang Jun, who had just finished his internship overtime, rushed straight to the stop. As he approached, the last bus had already arrived, but Xie Junhui had not yet reached the station. Fortunately, the driver saw Wang Jun sprinting in the mirror and waited a moment. Wang Jun ran all the way and finally caught the bus at the last second."

(2) Viewpoint-related narrative material:
"Wang Yingying's computer suddenly crashed with a blue screen, but she had set up automatic timed saving. She was stunned by the sudden blue screen, thinking about the nearly 2000-word document she had just written without saving. Fortunately, she had previously set up automatic timed saving that backed up every ten minutes; otherwise, she would have wasted more than two hours and had to rewrite it—she couldn't imagine how devastating that would be. She was truly grateful for the tutorial she had watched before; indeed, sharpening the axe won't delay the cutting of firewood."

2.2.2 Cooperation Task

Based on Bowen's (1943) public goods game paradigm, each participant represented their assigned group in a game. The game opponents were virtual participants, though participants were told they were real experimental subjects. The experiment consisted of eight game rounds, with a different opponent in each round. Opponents could be representatives from either the same group or a different group, and narrative information about the opponent was randomly presented before each round. Both the participant and the opponent initially possessed 50 tokens in each round and could voluntarily invest any number from 0 to 50 tokens into a public account. Tokens invested in the public account were multiplied by 1.5 and then distributed equally between both parties. The participant's final earnings consisted of the sum of their remaining tokens and their share from the public account. Additionally, the participant's group received corresponding points based on their final investment earnings, and when their group's total points were highest, each group member received additional token rewards.

2.3 Experimental Procedure

Before the experiment, the experimenter introduced the experimental procedure to participants, explaining that it was an investment decision-making game. Participants were then assigned to red or blue groups using the minimal group paradigm and informed that they would participate as group representatives and that their performance would affect their group's final rewards. After reading the instructions and completing a comprehension check to ensure understanding, participants proceeded to the formal experiment. Upon completion of all tasks, participants were asked to guess the experimental purpose and received compensation.

The public goods game paradigm task was programmed using E-Prime 2.0 software.

2.4 Results

Study 1 examined the effect of narrative information type on parochial cooperation and whether this effect was achieved by reducing in-group cooperation or increasing out-group cooperation. Since the number of tokens participants invested in the public account was distributed equally to both parties, the investment amount could be regarded as the cooperation level with the game opponent.

First, with narrative information type as a control variable, we compared cooperation levels with in-group versus out-group members, finding that participants' cooperation with in-group members (M = 123.03, SD = 38.46) was significantly higher than with out-group members (M = 109.03, SD = 35.82), demonstrating clear parochial cooperation tendencies (t(36) = 2.38, p = 0.02, Cohen's d = 0.39, medium effect size). Second, examining the effect of narrative information type on cooperation levels with in-group and out-group members revealed that under event-related narrative conditions, participants' cooperation with in-group members (M = 65.41, SD = 20.12) was significantly higher than with out-group members (M = 51.84, SD = 20.82, t(36) = 4.55, p < 0.001, Cohen's d = 0.75, large effect size), indicating that parochial cooperation persisted under event-related narrative conditions. However, under viewpoint-related narrative conditions, no significant difference existed between cooperation with in-group and out-group members (t(36) = −0.11, p = 0.91), confirming that parochial cooperation was suppressed.

Further comparisons of cooperation level changes with in-group and out-group members across different narrative information types showed that under viewpoint-related narrative conditions, participants' out-group cooperation level (M = 57.19, SD = 18.10) was significantly higher than under event-related narrative conditions (M = 51.84, SD = 20.82, t(36) = −2.11, p = 0.042, Cohen's d = 0.35, medium effect size), confirming that viewpoint-related narrative information suppressed parochial cooperative behavior by enhancing cooperation with out-groups (rather than reducing cooperation with in-groups).

3.1 Participants

Using G*Power 3.1 for sample size estimation (Faul et al., 2007), with a significance level of $\alpha = 0.05$, medium effect size ($d = 0.5$), and predicted statistical power of 80%, a minimum of 34 participants was required for a paired-samples t-test. Forty university students (17 males) were recruited, with a mean age of 18.8 ± 1.22. All participants had normal or corrected-to-normal vision, were right-handed, and had not participated in similar experiments recently. A sensitivity analysis using *G*Power 3.1 with significance level $\alpha = 0.05$ and statistical power $1 - \beta = 0.8$ revealed that with a sample size of 40, the effect size was 0.40.

3.2.1 Narrative Information Materials

Same as Study 1.

3.2.2 Perceived Similarity Measurement

Two items were used to measure participants' perceived similarity with game opponents: (1) Batson et al.'s (2005) self-report question, "To what extent would you use 'we' to describe your relationship with the other party?" and (2) Aron et al.'s (1992) Inclusion of Other in the Self scale (IOS). Both items used a seven-point scoring system.

3.2.3 Cooperation Task

We employed Aaldering and Böhm's (2019) Intergroup Parochial and Universal Cooperation game (IPUC game), which simultaneously measures weak parochial cooperation, strong parochial cooperation, and universal cooperation, allowing for differentiation among various cooperative behaviors and facilitating further investigation into the mechanism through which viewpoint-related narrative information affects parochial cooperation.

In the IPUC task, all game opponents were representatives from different groups, and three public accounts were established. At the beginning of each round, both parties possessed 10 tokens and could allocate any number of tokens to the three public accounts. Specifically, each token invested in Public Account A yielded 0.5 tokens for each member of the participant's own group, with no gain or loss for the opponent's group—thus, more tokens invested in Account A indicated higher weak parochial cooperation. Each token invested in Public Account B yielded 0.5 tokens for each member of the participant's group while causing the opponent's group members to lose 0.25 tokens—thus, more tokens invested in Account B indicated higher strong parochial cooperation. Each token invested in Public Account C yielded 0.4 tokens for everyone, including members of other groups—thus representing universal cooperation tendencies.

In summary, participants' final asset earnings = remaining tokens + public account returns − losses caused by other groups' investments. When the participant's group achieved the highest total tokens, each group member received additional token rewards.

3.3 Experimental Procedure

Same as Study 1.

3.4.1 Effects of Narrative Information on Parochial Cooperative Behavior

A paired-samples t-test was conducted on the total number of tokens participants invested in Public Accounts A and B. Results showed a significant differ-

ence between the viewpoint-related narrative information condition (M = 20.82, SD = 4.68) and the event-related narrative information condition (M = 22.82, SD = 4.68; t(39) = 2.73, p = 0.01, Cohen's d = 0.43), indicating that the two types of narrative information differentially affected parochial cooperative behaviors.

Separate analyses examined the effects of narrative information on weak parochial, strong parochial, and universal cooperation. Results revealed no significant difference in weak parochial cooperation between the two narrative information conditions (t(39) = −0.73, p = 0.47), which was therefore excluded from subsequent mediation model analysis. A paired-samples t-test on strong parochial cooperation showed that tokens invested in Public Account B under viewpoint-related narrative information (M = 4.63, SD = 4.43) were significantly lower than under event-related narrative information (M = 7.13, SD = 5.59), indicating lower strong parochial cooperation levels under viewpoint-related conditions (t(39) = 3.22, p = 0.003, Cohen's d = 0.51). A paired-samples t-test on universal cooperation revealed no significant difference in total tokens invested between the two narrative information conditions (t(39) = −1.78, p = 0.08), indicating that narrative information type did not affect universal cooperation levels, which was also excluded from subsequent mediation analysis.

3.4.2 Mediating Role of Perceived Similarity

Following Hayes's (2009) bootstrap method, we used Process 4.0 to conduct a bias-corrected bootstrapping test with 5,000 resamples to examine the mediating role of perceived similarity in the relationships between narrative information and parochial cooperative behavior, as well as between narrative information and strong parochial cooperative behavior.

Mediation analysis results showed that the indirect effect of narrative information on parochial cooperation through perceived similarity was −0.54, with a 95% bootstrap confidence interval of [−1.48, 0.32], which included zero, indicating a non-significant mediating effect.

Table 1 Regression Analysis of the Narrative Information Mediation Model

	Overall Fit Index	Strong Parochial Cooperation	Perceived Similarity	Strong Parochial Cooperation
		Narrative Information	Narrative Information	Perceived Similarity
Regression Coefficient	8.72**	4.91*	8.72***	
Significance				
	−0.24	−2.22*	2.95**	
	−0.37	−0.13	3.44***	

	Overall Fit Index	Strong Parochial Cooperation	Perceived Similarity	Strong Parochial Cooperation
	−1.15			

Note: $p < 0.05$; ***p < 0.01;*** p < 0.001. The same applies below.

When narrative information (independent variable), perceived similarity (mediator), and strong parochial cooperation (dependent variable) were included in the model, narrative information type significantly positively predicted perceived similarity (event-related narrative information = 0, viewpoint-related narrative information = 1, $\beta = 0.32$, p = 0.003), and perceived similarity significantly negatively predicted strong parochial cooperation ($\beta = -0.37$, p < 0.001). Further analysis revealed that the indirect effect of narrative information type on strong parochial cooperation through perceived similarity was −1.21, with a 95% bootstrap confidence interval of [−2.39, −0.27], which did not include zero, indicating a significant mediating effect. After including the mediator, the direct effect was −1.29, with a 95% bootstrap confidence interval of [−3.52, −0.82], which included zero, indicating a non-significant direct effect and thus full mediation (see Table 2 and Figure 2 [Figure 2: see original paper]).

Table 2 Bootstrap Test of Narrative Information Mediating Effect

	Boot SE	Bootstrap 95% CI	Relative Effect Proportion
	−2.50	−4.64	
	−1.29	−3.52	100.00%
	−1.21	−2.39	51.60%
	−0.02	−0.38	48.40%
Perceived Similarity	0.32**	−0.37***	
Narrative Information	−0.13		

Figure 2 [Figure 2: see original paper] Path Diagram of Perceived Similarity's Mediating Effect on the Relationship Between Narrative Information and Parochial Cooperative Behavior

4.1 Participants

Using a within-subjects design and G*Power 3.1 for sample size estimation (Faul et al., 2007), with a significance level of $\alpha = 0.05$, medium effect size ($f = 0.25$), and predicted statistical power of 80%, a minimum of 68 participants was required for a two-way repeated measures ANOVA. Eighty university students (28 males) were recruited, with a mean age of 18.90 ± 1.23. All participants had normal or corrected-to-normal vision, were right-handed, and had not participated in similar experiments recently. A sensitivity analysis using G*Power 3.1

with significance level $\alpha = 0.05$ and statistical power $1 - \beta = 0.8$ revealed that with a sample size of 80, the effect size was 0.19.

4.2.1 Narrative Information Materials

Same as Study 1.

4.2.2 Cooperation Task

Same as Study 2.

4.3 Experimental Procedure

Based on the minimal group paradigm grouping, participants' intergroup relations were manipulated through a timed arithmetic task. In the cooperative intergroup relation condition, participants were told that "when the average accuracy rate of all participants (including other groups) exceeds 75%, everyone wins the challenge and receives additional rewards." In the competitive intergroup relation condition, participants were told that "only the group with the highest average accuracy rate receives additional rewards." Subsequently, participants read the instructions and completed a comprehension check. After confirming understanding, they proceeded to the formal experiment. Upon completion of all tasks, participants were asked to guess the experimental purpose and received compensation.

The public goods game paradigm task was programmed using E-Prime 2.0 software.

4.4.1 Manipulation Check

Participants were asked to rate "the importance of having a higher accuracy rate than other group members during the arithmetic task" on a seven-point scale. Results showed that ratings in the competitive intergroup relation group were significantly higher than in the cooperative intergroup relation group ($t(78) = -4.34$, $p < 0.001$), confirming the effectiveness of the intergroup relation manipulation.

4.4.2 Testing the Moderated Mediation Model: Intergroup Relations, Narrative Information, and Parochial Cooperative Behavior

First, using SPSS 26.0 macro Process 4.0 Model 4 (Hayes, 2013), we examined the mediating effect of perceived similarity in the relationship between narrative information type and parochial cooperative behavior. Results showed that narrative information significantly positively predicted perceived similarity ($\beta = 2.05$, $p = 0.009$), and perceived similarity significantly negatively predicted

parochial cooperative behavior ($\beta = -0.16$, p = 0.015). Further analysis revealed that the indirect effect of narrative information on parochial cooperative behavior through perceived similarity was −0.33, with a 95% bootstrap confidence interval of [−0.75, −0.02], indicating a significant mediating effect. After including the mediator, the direct effect was 0.79, with a 95% bootstrap confidence interval of [−0.48, 2.05], which included zero, indicating a non-significant direct effect and thus full mediation.

We analyzed the mediating effect of perceived similarity in the relationships between narrative information type and weak parochial cooperation, as well as between narrative information type and strong parochial cooperation. Results showed that the indirect effect of narrative information on weak parochial cooperative behavior through perceived similarity was 0.11, with a 95% bootstrap confidence interval of [−0.11, 0.42], indicating a non-significant mediating effect. For strong parochial cooperative behavior, narrative information significantly positively predicted perceived similarity ($\beta = 2.05$, p = 0.009), and perceived similarity significantly negatively predicted strong parochial cooperative behavior ($\beta = -0.21$, $p < 0.001$). Further analysis revealed that the indirect effect of narrative information on strong parochial cooperative behavior through perceived similarity was −0.44, with a 95% bootstrap confidence interval of [−0.81, −0.11], indicating a significant mediating effect. After including the mediator, the direct effect was 0.80, with a 95% bootstrap confidence interval of [−0.04, 1.64], which included zero, indicating a non-significant direct effect and thus full mediation. Therefore, the results of Studies 2 and 3 consistently demonstrated that narrative information affects parochial and strong parochial cooperative behavior through perceived similarity, confirming the stability of this mediation model.

We then analyzed the moderating effect of intergroup relations in this mediation model. Results showed that the interaction term between intergroup relations and narrative information did not significantly affect perceived similarity (interaction: B = −2.65, SE = 1.54, 95% CI [−5.69, 0.39]; narrative information: B = 3.38, SE = 1.09, 95% CI [1.22, 5.52]; intergroup relations: B = 1.68, SE = 1.09, 95% CI [−0.48, 3.82]). The interaction term between intergroup relations and perceived similarity did not significantly affect strong parochial cooperation levels (interaction: B = −0.11, SE = 0.08, 95% CI [−0.27, 0.05]; perceived similarity: B = −0.16, SE = 0.06, 95% CI [−0.27, −0.04]; intergroup relations: B = 1.07, SE = 0.56, 95% CI [−0.03, 2.17]). However, the interaction term between narrative information and intergroup relations significantly affected strong parochial cooperation levels (interaction: B = 1.59, SE = 0.80, 95% CI [0.01, 3.17]; narrative information: B = −0.07, SE = 0.58, 95% CI [−1.22, 1.07]; intergroup relations: B = 1.07, SE = 0.56, 95% CI [−0.03, 2.17]).

In summary, intergroup relations moderated the direct path of narrative information's effect on parochial and strong parochial cooperation, while the moderating effect on the mediating path through perceived similarity was not significant. Based on these findings, we further analyzed the effects of intergroup

relations and narrative information on the three types of parochial cooperative behavior.

4.4.3 Effects of Narrative Information and Intergroup Relations on Parochial Cooperative Behavior

A two-way repeated measures ANOVA was conducted with the total number of tokens participants invested in Public Accounts A and B as the dependent variable to examine the effects of narrative information and intergroup relations on parochial cooperative behavior. Results showed that the main effect of narrative information was not significant ($F(1, 78) = 0.98$, $p = 0.32$). The main effect of intergroup relations was significant ($F(1, 78) = 33.70$, $p < 0.001$, $^2 = 0.30$, large effect size), with parochial cooperation levels in the cooperation group significantly lower than in the competition group (cooperation context = 0, competition context = 1). The interaction between narrative information and intergroup relations was significant ($F(1, 78) = 8.53$, $p = 0.005$, $^2 = 0.10$, large effect size).

Simple effects analysis (see Figure 3 [Figure 3: see original paper]) showed that in the cooperation context, there was no significant difference in the total tokens invested in Public Accounts A and B between event-related and viewpoint-related narrative conditions ($F(1, 78) = 1.86$, $p = 0.18$). In the competition context, however, the total tokens invested in Public Accounts A and B under viewpoint-related narrative conditions ($M = 14.60$, $SD = 3.07$) were significantly higher than under event-related narrative conditions ($M = 12.78$, $SD = 3.66$, $F(1, 117) = 0.56$, $p = 0.007$).

Figure 3 [Figure 3: see original paper] Interaction Between Intergroup Relations and Narrative Information (Parochial Cooperation)
Note: Error bars represent SD. ns indicates $p > 0.05$, * indicates $p < 0.05$, ** indicates $p < 0.01$, *** indicates $p < 0.001$.

4.4.4 Effects of Narrative Information and Intergroup Relations on Weak Parochial Cooperative Behavior

A two-way repeated measures ANOVA was conducted with the number of tokens invested in Public Account A as the dependent variable to examine the effects of narrative information and intergroup relations on weak parochial cooperative behavior. Results showed that the main effect of narrative information was not significant ($F(1, 78) = 0.06$, $p = 0.81$). The main effect of intergroup relations was significant ($F(1, 78) = 10.76$, $p = 0.002$, $^2 = 0.12$, medium effect size), with weak parochial cooperation behavior in the cooperation group significantly lower than in the competition group. The interaction between narrative information and intergroup relations was not significant ($F(1, 78) = 0.97$, $p = 0.33$, $^2 = 0.01$, small effect size).

4.4.5 Effects of Narrative Information and Intergroup Relations on Strong Parochial Cooperative Behavior

A two-way repeated measures ANOVA was conducted with the number of tokens invested in Public Account B as the dependent variable to examine the effects of narrative information and intergroup relations on strong parochial cooperative behavior. Results showed that the main effect of narrative information was not significant ($F(1, 78) = 0.94$, $p = 0.34$). The main effect of intergroup relations was significant ($F(1, 78) = 15.13$, $p < 0.001$, $^2 = 0.16$), with strong parochial cooperation behavior in the cooperation group significantly lower than in the competition group. The interaction between narrative information and intergroup relations was significant ($F(1, 78) = 6.60$, $p = 0.012$, $^2 = 0.08$, medium effect size).

Simple effects analysis (see Figure 4 [Figure 4: see original paper]) showed that in the cooperation context, there was no significant difference in tokens invested in Public Account B between event-related and viewpoint-related narrative conditions ($F(1, 78) = 1.28$, $p = 0.261$). In the competition context, however, tokens invested in Public Account B under viewpoint-related narrative conditions ($M = 5.55$, $SD = 2.99$) were significantly higher than under event-related narrative conditions ($M = 4.22$, $SD = 3.02$, $F(1, 117) = 6.25$, $p = 0.015$). Viewpoint-related narrative information elicited more strong parochial cooperation than event-related narrative information, with the behavioral effect of narrative information on strong parochial cooperation reversing under different intergroup relations.

Figure 4 [Figure 4: see original paper] Interaction Between Intergroup Relations and Narrative Information (Strong Parochial Cooperation)
Note: Error bars represent SD. ns indicates $p > 0.05$, * indicates $p < 0.05$, ** indicates $p < 0.01$, *** indicates $p < 0.001$.

5.1 The Relationship Between Narrative Information and Parochial Cooperation

Study 1 replicated previous findings that viewpoint-related narrative information more effectively reduces parochial cooperative behavior compared to event-related narrative information (Bruneau et al., 2017; Koch et al., 2020). Theory of Mind (ToM) proposes that recognizing others' mental states is fundamental to attributing their behavior, and these attributions subsequently influence individuals' behavioral tendencies (Zhao et al., 2022; Chen & Xu, 2020). Research has found that when individuals gain deeper understanding of strangers, they feel that the strangers also understand them better, leading to reciprocal perceptions of being understood and consequently reducing self-interested behavior (Shah & LaForest, 2022). Compared to event-related narrative information that objectively describes contextual details such as time, place, and characters, viewpoint-related narrative information provides access to understanding others' thoughts, feelings, and attitudes during events, helping individuals recognize,

understand, and empathize with others' inner experiences, thereby promoting positive attributions about others' behavior, inhibiting self-interest tendencies, and enhancing cooperation willingness.

Studies 2 and 3 further distinguished between strong and weak parochial cooperation, finding that viewpoint-related narrative information only weakened strong parochial cooperation but could not reduce weak parochial cooperation. This suggests that viewpoint-related narrative information may be associated only with certain psychological components of strong parochial cooperation. Previous research indicates that the motivations underlying strong and weak parochial cooperation differ (Bornstein et al., 2004). Weak parochial cooperation is more closely related to in-group love, focusing primarily on the absolute benefits of the in-group rather than the out-group's gains or losses (Baron, 2001). Consequently, although viewpoint-related narrative information can move audiences, it struggles to shake their existing in-group identity, preventing its prosocial effects from manifesting in weak parochial cooperation driven by in-group love. In contrast, strong parochial cooperation is primarily driven by out-group hate (Böhm, 2016; Mifune et al., 2017). If weak parochial cooperation represents factionalism based on identity boundaries, strong parochial cooperation implies a "those who are not of our race must have different hearts" perspective. Out-group hate-driven strong parochial cooperation elevates the in-group while simultaneously intensifying derogation and suppression of out-groups to maintain the in-group's absolute advantage.

Infra-humanization theory posits that individuals universally exhibit a psychological tendency to avoid attributing human-specific secondary emotions (such as anger, joy, and fear) to out-groups while readily attributing secondary emotions like hope, regret, and guilt to in-groups (Leyens et al., 2003; Yang et al., 2015). In strong parochial cooperation, out-group hate often strengthens this tendency, triggering dehumanizing cognitive processing that strips out-groups of human characteristics (Leyens et al., 2003; Yang et al., 2015). In other words, in strong parochial cooperation, individuals tend to strip out-group members of certain human qualities, ignore their advanced emotions and mental components, and easily perceive out-group members as uncivilized, malicious, inferior groups distinct from the in-group. Consequently, individuals reduce empathy toward out-group members, decrease guilt about harming them, and exhibit more aggressive and exploitative behavior toward out-groups (Sun & Liu, 2021). The U.S. mainstream media's use of "racial profiling" to vilify and denigrate Chinese Americans—simultaneously needing their political votes and economic vitality while excluding them from core industries to avoid competition for employment resources (Chen & Chao, 2021)—can be understood as achieving "benefiting oneself at others' expense" strong parochial cooperation by diminishing out-groups' human characteristics. Narrative information about out-group members, especially viewpoint-related narrative information, can enhance understanding of others' perspectives and emotions, thereby inhibiting dehumanization tendencies to some extent (Gray et al., 2007), weakening hostility and hatred toward out-groups, and reducing strong parochial cooperative behavior.

Additionally, the game paradigm itself may be a factor causing the divergent effects of narrative information on strong versus weak parochial cooperation. Wolf et al. (2008) found that different game paradigms influence social decision-making. Traditional game research paradigms (e.g., NSD) only establish "single-win" and "double-win" payoff matrices, generally discussing parochial and universal cooperation. In contrast, this study employed the IPUC task, which establishes three accounts (A, B, and C) to create payoff matrices for strong parochial cooperation, weak parochial cooperation, and universal cooperation, distinguishing among "in-group only benefits," "in-group benefits and out-group losses," and "both groups benefit" cooperation types. Therefore, this study can more clearly differentiate the inhibitory effects of different narrative information types on strong versus weak parochial cooperative behavior.

5.2 The Mediating Role of Perceived Similarity

Previous research has found that narrative information reduces perception of targets' group identity and highlights their individual characteristics, thereby reducing parochial empathy—the so-called "dilution effect" (Bruneau et al., 2015). Building on this, this study proposed and verified the pathway through which narrative information reduces parochial cooperation: the role of perceived similarity.

The results of Studies 2 and 3 consistently demonstrated that viewpoint-related narrative information reduces strong parochial cooperation levels by eliciting perceived similarity. Koch et al. (2020) conducted sequential prisoner's dilemma games with members of different groups and found that perceived similarity indeed promotes intergroup cooperation. Compared to universal cooperation, parochial cooperation stems from distrust and fear of out-groups, leading individuals to perceive out-group members as strange, frightening, and mysterious others, and exhibiting dehumanization tendencies that perceive out-groups as more animal-like (Leyens et al., 2003) and lacking humanity (Haslam & Loughnan, 2014). Therefore, enhancing humanized cognition of out-groups and recognizing mutual similarities may be an effective path to reduce parochial cooperation and bridge intergroup distance. The key factor in being considered human is "having a mind," and narrative information describing out-group members' mental states can precisely reduce their "dehumanization" level (Gray et al., 2007). Extensive research shows that receiving viewpoint-related narrative information helps individuals understand others' spiritual worlds and mental activities, enhancing perceived similarity experienced through attitudinal, perspective, and value similarities, awakening perception of others' human characteristics, increasing interpersonal attraction, and establishing close interpersonal connections (Harrison et al., 1998; Harrison et al., 2002; Turban et al., 2002). In this study, high perceived similarity enabled participants to focus more on commonalities between themselves and others, effectively weakening boundary consciousness created by group identity and reducing strong parochial cooperative behavior.

5.3 The Moderating Role of Intergroup Relations

Study 3 found that the mediating effect of perceived similarity in the relationship between narrative information and parochial cooperation was not influenced by intergroup relations. However, cooperative versus competitive intergroup relations moderated the effect of narrative information on parochial cooperative behavior. Specifically, in cooperative contexts, narrative information showed no significant effect on parochial or strong parochial cooperation, whereas in competitive contexts, viewpoint-related narrative information conversely increased parochial and strong parochial cooperation levels.

Intergroup relations are important determinants of intergroup attitudes (Dovidio et al., 2003). Gaesser et al. (2020) argue that people do not live in a "vacuum"; real-life groups form complex relational networks through direct and indirect communication. For two groups, whether in a cooperative state or having cooperative experiences, shared interests provide important conditions for establishing positive relationships. Prior positive cooperative experiences can further strengthen mutual positive connections (Gaertner et al., 1999), reducing intergroup bias and improving intergroup attitudes (Gaertner et al., 1999). The groups may even form and establish a higher-level common in-group, significantly reducing intergroup differentiation and distinction (Dang et al., 2014). Consequently, cooperative intergroup relations mask the inhibitory effect of narrative information on parochial cooperation.

However, the finding that viewpoint-related narrative information enhanced parochial cooperative behavior under competitive conditions differs from our expectations. Possible explanations include: First, competitive conditions significantly enhance individuals' competitiveness and social comparison tendencies (Stapel & Koomen, 2005; Garcia et al., 2013), easily triggering relative deprivation and intergroup threat, which lead to negative out-group attitudes and parochial cooperation (Halevy et al., 2010). Second, this study's experiment did not separate the psychological processes of empathy and perspective-taking. Research has confirmed that when groups are in competition, individuals typically avoid empathy toward out-groups—that is, they stop attending to out-group members' emotional states and are more likely to engage in cognitive reappraisal of their perspectives and attitudes (Zaki, 2014). In this case, viewpoint-related narrative information may activate cognitive-level perspective-taking rather than affective-level empathic responses. However, perspective-taking does not always lead to prosocial intergroup relations (Zhao et al., 2012). When individuals infer that competitors may hold negative intentions or evaluations toward them, perspective-taking can trigger a self-centered intergroup interaction pattern, resulting in more parochial cooperation that advances in-group interests (Lammers et al., 2008). Under such circumstances, narrative information may evoke a competitive mindset of "know yourself and know your enemy, and you will never be defeated" rather than an emotional resonance of "putting oneself in others' shoes."

5.4 General Discussion

First, generally speaking, portraying the inner world of out-group members helps bridge intergroup distance and promote intergroup cooperation. Therefore, in cross-group contact involving different countries and ethnicities, we can not only enhance understanding through exchanging event-related information about historical changes and development status but also introduce emotional and attitudinal subjective elements to elicit deep resonance and cooperation. Second, the positive intergroup effects of viewpoint-related narrative information have boundary conditions. Especially when intergroup competition exists, subjective descriptions of another group's perspectives and feelings may instead trigger vigilance and aversion, thereby intensifying intergroup conflict. Thus, the prosocial intergroup effects of viewpoint-related narrative information are more applicable to two or more groups with limited prior interaction and relative unfamiliarity.

Currently, protectionism and unilateralism continue to surge, with countries vying for power in subtle ways. Against this backdrop, "telling China's story well" involves not only "telling" but also "telling skillfully." This can include introducing China's magnificent landscapes and glorious history as factual information, as well as describing the Chinese nation's love for peace and sense of responsibility as viewpoint-related information. Flexibly grasping the timing, level, and manner of dialogue with different groups allows for targeted promotion of intergroup exchange and cooperation. In complex international games, combining the "hardness" of objective narration with the "softness" of subjective narration to maximize the effectiveness of information communication in both content and form represents a beneficial attempt to promote civilizational dialogue and advance win-win cooperation.

5.5 Limitations and Future Directions

First, since no unified scale for perceived similarity currently exists, this study used two items to measure the construct; future research could optimize perceived similarity measurement. Second, this study presented narrative information only through brief text paragraphs; future studies could examine the relationship between different types of narrative information and parochial cooperative behavior through various modalities such as audio and video. Third, factors such as age, personality, and culture influence individuals' understanding of narrative information, making individual and group differences important directions for future exploration. Finally, this study focused only on direct participants in intergroup games, whereas bystanders are often key factors influencing the direction of real-world games. Therefore, it is necessary to examine the intergroup cooperation effects of narrative information from a bystander perspective.

- Compared to event-related statements about out-groups, viewpoint-related descriptions of their inner worlds can more effectively reduce

individuals' in-group love and thereby promote intergroup cooperation.
- Viewpoint-related information descriptions can lead individuals to perceive greater similarity with out-group members, thereby inhibiting behavior that harms out-groups for in-group benefit.
- Deep descriptions of inner worlds do not always facilitate intergroup cooperation; under competitive relations, they can instead strengthen individuals' parochial cooperation tendencies.

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