

Awe and Common Ingroup Identity: The Moderating Role of Perceived Resource Scarcity

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Abstract

Common ingroup identity refers to the assignment of a superordinate identity to two originally independent groups, which transforms group members' cognitive representation from two subgroups into a common ingroup and extends positive emotions toward ingroup members to former outgroup members, thereby facilitating improved intergroup relations and enhanced cohesion. In the face of a complex international environment, unity serves as a crucial force for national development; consequently, enhancing common ingroup identity is of vital importance to national development. The present research investigates the influence of awe on common ingroup identity and its underlying mechanisms through questionnaire surveys (Study 1) and by manipulating awe and perceived resource scarcity (Studies 2-4). The results reveal that high perceived resource scarcity weakens the effect of trait awe on common ingroup identity (Study 1) and moderates the relationship between threat-based awe and common ingroup identity (Studies 2-4), such that high perceived resource scarcity inhibits the facilitative effect of threat-based awe on common ingroup identity. These findings suggest that group cohesion can be enhanced by strengthening awe, particularly positive awe.

Full Text

Awe and Common Ingroup Identity: The Moderating Role of Perceived Resource Scarcity

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Abstract

Common ingroup identity refers to the process of assigning a superordinate identity to two originally independent groups, transforming members' cognitive representation from two subgroups into a single common ingroup and extending positive emotions from ingroup members to former outgroup members, thereby improving intergroup relations and enhancing cohesion. Facing a complex international environment, unity constitutes a vital force for national development, making it crucial to understand how to enhance common ingroup identity. This article examined the effect of awe on common ingroup identity and its underlying mechanisms through questionnaire surveys (Study 1) and experimental manipulations of awe and perceived resource scarcity (Studies 2-4). Results revealed that high perceived resource scarcity weakened the influence of trait awe on common ingroup identity (Study 1) and moderated the relationship between threat-based awe and common ingroup identity (Studies 2-4), such that high perceived resource scarcity inhibited the promoting effect of threat-based awe on common ingroup identity. These findings suggest that we can enhance common ingroup identity, particularly through positive awe, to strengthen group cohesion.

Keywords: positive awe, threat-based awe, perceived resource scarcity, common ingroup identity

Whether witnessing waterfalls cascading from the heavens, vast boundless grasslands, or devastating earthquakes, floods, and plagues, individuals may experience awe. Awe represents an emotional experience when the self confronts something more vast, grand, and beyond current comprehension (Keltner & Haidt, 2003) and can be divided into positive awe and threat-based awe (Gordon et al., 2017). Positive awe refers to a strong emotional experience of reverence and wonder triggered by non-threatening stimuli, such as magnificent nature, whereas threat-based awe describes a strong emotional experience of fear and wonder when facing threats, such as floods (Gordon et al., 2017; Li et al., 2024; Zhao et al., 2023). Previous research has found that awe can promote intergroup relations; for instance, awe reduces stigmatization of people with AIDS (Luo et al., 2022), possibly because awe enhances individuals' high-level connection with others or the world (Yaden et al., 2019), and this sense of connection helps reduce stigmatization (Brannon & Walton, 2013).

However, current research on awe promoting intergroup relations has not fundamentally changed group identity, whereas common ingroup identity can promote intergroup relations by altering group identity. Common ingroup identity refers to assigning a superordinate identity to two originally independent groups, transforming group members' cognitive representation from two subgroups into a common ingroup, and extending positive emotions from ingroup members to former outgroup members (Gaertner et al., 1993). For example, for people

from different ethnic groups, the superordinate identity is the Chinese nation; common ingroup identity thus represents identification with the Chinese nation. For students from different classes, the superordinate identity is students of the same school; common ingroup identity represents identification with being a student of that school. Compared with previous research showing that awe enhances connectedness to promote intergroup relations, common ingroup identity constructs a superordinate identity that directly transforms former outgroup members into ingroup members, thereby more effectively promoting intergroup relations. Previous studies have found that common ingroup identity not only reduces intergroup bias (Guan & Rong, 2020) and increases prosocial behavior (Levine et al., 2005) but also enhances intimacy among members of different races (Leung et al., 2022), promotes psychological integration (Liang et al., 2020), and boosts cohesion and sense of belonging (Ufkes et al., 2016).

According to the self-diminishment hypothesis (Jiang et al., 2024; Seo et al., 2023) and self-transcendence hypothesis of awe (Lin et al., 2025; Jiang et al., 2024; Jiang & Sedikides, 2022), on the one hand, awe may generate a “small self” that motivates individuals to integrate themselves into social collectives (Chen & Boucher, 2008) to satisfy belongingness needs. On the other hand, awe may expand self-boundaries to establish connections with the outside world. For example, Seo et al. (2023) found that awe can promote global identity identification, suggesting that awe may facilitate common ingroup identity.

Nevertheless, does awe always promote common ingroup identity? Previous research found that perceived resource scarcity moderated the relationship between common threat and intergroup cooperation, such that under high perceived resource scarcity, common threat did not promote and even hindered intergroup cooperation (Miao et al., 2023), while intergroup cooperation facilitates common ingroup identity formation (Adachi et al., 2016). Common threat here refers to threats facing humanity such as earthquakes, floods, and pandemics—events that also elicit awe. Does the effect of awe on common ingroup identity similarly depend on perceived resource scarcity?

According to scarcity theory (Mani et al., 2013), when individuals perceive resource scarcity, they focus attention on scarce resources, thereby reducing “cognitive bandwidth,” amplifying the self, and hindering the emergence of “small self” feelings. Simultaneously, outgroups may be viewed as competitors for limited resources (Gamez-Djokic & Waytz, 2020), which is not conducive to expanding self-other connections and thus undermines awe’s promotion of common ingroup identity. However, existing literature has not explained how perceived resource scarcity moderates the effect of awe on common ingroup identity. From an emotional perspective, this study aimed to explore the impact of awe on common ingroup identity and the moderating role of perceived resource scarcity, providing more direct and effective evidence for awe’s promotion of intergroup relations and summarizing experiences for responding to major crises such as pandemics and earthquakes to inform national crisis management.

1.1 The Relationship Between Awe and Common Ingroup Identity

Awe may promote common ingroup identity. Current research on awe includes the self-diminishment hypothesis and self-transcendence hypothesis. The self-diminishment hypothesis posits that awe can alter self-concept by contacting something grander than the self, reducing self-awareness, weakening the individual self-component in self-concept, generating feelings of smallness, and forming a “small self” (Jiang et al., 2024; Seo et al., 2023). When individuals feel small, they often crave belonging to alleviate inner loneliness and helplessness (Stellar et al., 2017), integrate themselves into social collectives (Chen & Boucher, 2008), enhance feelings of unity with others (Waugh & Fredrickson, 2006), and consequently form “common” category membership representations that include both ingroup and outgroup members in a superordinate group (Dovidio et al., 1995; Gaertner et al., 1993).

The self-transcendence hypothesis argues that awe prompts individuals to break self-imposed limitations, expand self-concept, transcend self-centeredness, shift attention from daily trivialities to greater spiritual needs, provide a broader self-perspective, promote self-insight and motivation to pursue authentic self, emphasize connections between self and environment, and view self and world from a more integrated perspective (Lin et al., 2025; Jiang et al., 2024; Jiang & Sedikides, 2022). Unlike the self-diminishment hypothesis’ s “small self” that promotes external connections by devaluing the self, the self-transcendence hypothesis emphasizes expanding self-boundaries to establish external connections. For instance, Seo et al. (2023) preliminarily validated the relationship between awe and common ingroup identity; through recall-writing tasks, images, and video manipulations of awe, they examined awe’ s effect on global citizenship identification and found that awe transcended “smallness feelings,” broadened self-concept, enhanced individuals’ connection with larger entities, and promoted global citizenship identification.

Additionally, awe may motivate individuals to reduce uncertainty by seeking order or coherence, encouraging bottom-up cognitive processing to adjust existing mental frameworks to accommodate new information or experiences, thereby expanding knowledge systems (Jiang et al., 2024), reducing outgroup stereotypes (Luo et al., 2022), and promoting connections with humanity and ingroup prosocial behavior (Luo et al., 2023). For example, Luo et al. (2023) found that during the COVID-19 pandemic, awe promoted prosocial behavior by enhancing connectedness with all humanity and the world and empathy for patients, supporting national pandemic response efforts. Therefore, this study hypothesized that awe promotes common ingroup identity (Hypothesis 1).

1.2 The Moderating Role of Perceived Resource Scarcity

Does awe always promote common ingroup identity? Perceived resource scarcity arises when individuals feel they have fewer resources than needed

(Mullainathan & Shafir, 2013). Perceived scarcity may stem not only from objective resource deficiency but also from subjective feelings of having too few resources (DeSousa & Rego, 2022). For example, economically well-off individuals may still feel resource scarcity when comparing themselves to wealthier people (Mullainathan & Shafir, 2013). This suggests that even when resources are objectively sufficient, scarcity-related cues can still make people perceive resource scarcity (Roux et al., 2015). During the COVID-19 pandemic, when people encountered false information about scarce medical resources, they perceived resource scarcity despite objectively adequate supplies (Miao et al., 2023).

According to scarcity theory (Mani et al., 2013), when perceiving resource scarcity, people focus on group interests related to scarcity rather than cross-group common fate. Perceived resource scarcity concentrates attention on scarcity-salient domains, reduces “cognitive bandwidth,” and focuses on immediate interests (Mani et al., 2013; Shah et al., 2012). Therefore, compared with low perceived resource scarcity, under high perceived resource scarcity, individuals may focus more on resource acquisition and survival needs, reduce resource allocation to others (Cui et al., 2022), and become more selfish (Roux et al., 2015). This inadvertently amplifies the self, prevents small self feelings, and views other group members as competitors for limited resources, leading to group competition (Gamez-Djokic & Waytz, 2020), reducing intergroup cooperation (Miao et al., 2023) and common ingroup identity.

Conversely, under low perceived resource scarcity, when individuals experience awe, it induces small self feelings that connect them with others (Stellar et al., 2017), may break self-imposed limitations, transcend self-boundaries, expand self-concept, and consequently enhance “common” category membership representation in self-concept, transforming group representation from “us” and “them” to a superordinate “us” and recategorizing separate groups into an inclusive superordinate group (Gaertner et al., 1993).

Therefore, compared with low perceived resource scarcity, high perceived resource scarcity weakens awe’s promoting effect on common ingroup identity (Hypothesis 2). This article verified hypotheses through four studies. Study 1 used questionnaires to explore relationships among trait awe, common ingroup identity, and perceived resource scarcity. Studies 2 and 3 manipulated awe through videos and perceived resource scarcity to further examine awe’s promoting effect on common ingroup identity. Study 4, building on Study 3, used a recall-writing paradigm to manipulate awe and measured common ingroup identity with the Chinese National Identity Scale to further investigate the effects of awe and perceived resource scarcity on common ingroup identity.

2 Study 1: Relationships Among Trait Awe, Common Ingroup Identity, and Perceived Resource Scarcity

Study 1 aimed to examine relationships among trait awe, common ingroup identity, and perceived resource scarcity through questionnaire surveys.

2.1 Participants

This study used G*Power 3.1 (Faul et al., 2009) to estimate sample size. Referencing Preston and Shin's (2017) awe-related research, with significance level $\alpha = 0.05$ and medium effect size ($f = 0.25$), at least 120 participants were needed to achieve 80% statistical power. The actual sample comprised 408 university students. After excluding invalid data from incomplete responses, overly short completion times, and patterned responses, 376 valid responses remained (101 males, 275 females; 329 Han ethnicity, 47 ethnic minorities), achieving an actual statistical power of 99.88%. Participants' mean age was 20.72 ± 2.05 years. To verify data validity from the actual sample size, sensitivity analysis revealed that this sample provided 85% power to detect an effect size of $f = 0.15$ or larger at a 5% false positive rate.

2.2 Measures

Trait Awe Scale. Following Xin et al. (2021), we adopted the awe subscale from Shiota et al.'s (2006) Dispositional Positive Emotion Scales (DPES). The scale contains 6 items including awe-related descriptions such as "I often feel awe" and "I am surrounded by beauty." Using a 7-point scale (1 = "strongly disagree," 7 = "strongly agree"), higher scores indicated higher trait awe. The internal consistency coefficient in this study was 0.75.

Common Ingroup Identity Scale. Following Zhou et al. (2018), we used an adapted common ingroup identity scale (Cakal et al., 2016; Ufkes et al., 2015), modifying original item wording according to research content. The common ingroup was described as "students of this university," with sample items including: "In our school, regardless of ethnicity, all students are students of this university, and as a student of this school, I feel very happy," and "In our school, regardless of ethnicity, all students are students of this university, and this identity is very important to me." The scale contained 2 items using a 7-point scale (1 = "strongly disagree," 7 = "strongly agree"). The correlation between the two items in this study was 0.63.

Perceived Resource Scarcity. Following Pitesa and Thau (2018), we measured perceived resource scarcity with 5 items such as "Basic resources are scarce." Using a 7-point scale (1 = "strongly disagree," 7 = "strongly agree"), higher scores indicated higher perceived resource scarcity. The questionnaire's internal consistency coefficient was 0.93.

2.3 Results

Common Method Bias Test. Exploratory factor analysis was used to test for potential common method bias. Integrating all questionnaire items for exploratory factor analysis, the first extracted common factor explained 34.59% of variance, less than 40%. Therefore, no serious common method bias existed among the variables in this study.

Descriptive Statistics and Correlation Analysis. As shown in Table 1, descriptive statistics and correlation analysis results for all variables are presented below.

Table 1 Correlations among gender, age, awe, common ingroup identity, and perceived resource scarcity

1. Gender
2. Age
3. Awe
4. Common ingroup identity
5. Perceived resource scarcity

Note: ** $p < 0.001$, $p < 0.05$; Gender: male = 0, female = 1

Moderating Effect of Perceived Resource Scarcity. Using PROCESS macro Model 1 for moderation effect testing, all predictor variables were standardized. Awe was set as the independent variable, common ingroup identity as the dependent variable, and perceived resource scarcity as the moderator. The moderating effect of perceived resource scarcity on the relationship between awe and common ingroup identity was examined, with results shown in Table 2.

Table 2 Moderating effect test of perceived resource scarcity

95% confidence interval

6.49*** [0.27, 0.50]

Common ingroup identity

Perceived resource scarcity [-0.18, 0.02]

Awe \times Perceived resource scarcity -2.37* [-0.22, -0.02]

Note: ** $p < 0.001$, $p < 0.05$, all two-tailed tests.

Awe positively predicted common ingroup identity. The moderating effect of perceived resource scarcity on the relationship between awe and common ingroup identity was significant, $\beta = -0.12$, $t = -2.37$, $p = 0.019$, 95% CI = [-0.22, -0.02]. Further simple slope analysis (see Figure 1 [FIGURE:1]) showed that in the low perceived resource scarcity group (M -1SD), awe positively predicted common ingroup identity, $\beta = 0.51$, $t = 6.15$, $p < 0.001$, 95% CI = [0.35,

0.67]; while in the high perceived resource scarcity group ($M + 1SD$), although awe also positively predicted common ingroup identity, $\beta = 0.25$, $t = 3.33$, $p = 0.001$, 95% CI = [0.10, 0.40], the relationship strength weakened. This indicates that high perceived resource scarcity weakened the positive predictive effect of awe on common ingroup identity.

Figure 1 Moderating effect of perceived resource scarcity on the relationship between awe and common ingroup identity

2.4 Discussion

Study 1 examined relationships among trait awe, perceived resource scarcity, and common ingroup identity. Results revealed that trait awe positively predicted common ingroup identity, with perceived resource scarcity playing a moderating role—high perceived resource scarcity buffered the positive predictive effect of trait awe on common ingroup identity compared with low perceived resource scarcity. However, Study 1 only examined relationships among the three variables through questionnaires and could not address the causal effect of awe on common ingroup identity. Study 2 further examined awe's promoting effect on common ingroup identity and the moderating role of perceived resource scarcity through experimental manipulation of awe and perceived resource scarcity.

3 Study 2: The Effect of State Awe on Common Ingroup Identity: The Moderating Role of Perceived Resource Scarcity

Study 2 manipulated awe and perceived resource scarcity by having participants watch videos and read articles about medical resource scarcity in a pandemic context to further examine awe's effect on common ingroup identity.

3.1 Participants and Design

This study used a two-factor between-subjects design: 3 (positive awe vs. threat-based awe vs. control) \times 2 (high perceived resource scarcity vs. low perceived resource scarcity). The dependent variable was scores on the common ingroup identity scale.

Using G*Power 3.1 (Faul et al., 2009) to estimate sample size and referencing Preston and Shin's (2017) awe-related research, with significance level $\alpha = 0.05$ and medium effect size ($f = 0.25$), at least 158 participants were needed to achieve 80% statistical power. The actual sample comprised 240 university students. After excluding invalid data from incomplete responses, overly short completion times, and patterned responses, 216 valid responses remained (152 males, 64 females; 196 Han ethnicity, 20 ethnic minorities), achieving an actual statistical power of 91.47%. Participants' mean age was 18.47 ± 0.80 years. Sensitivity analysis indicated that this sample provided 85% power to detect an

effect size of $f = 0.23$ or larger at a 5% false positive rate. Specifically, the positive awe-high perceived resource scarcity group had 35 participants, positive awe-low perceived resource scarcity group had 36; threat-based awe-high perceived resource scarcity group had 36, threat-based awe-low perceived resource scarcity group had 35; control-high perceived resource scarcity group had 35, and control-low perceived resource scarcity group had 39. All participants volunteered, had normal or corrected-to-normal vision, and no cognitive impairments. They provided informed consent before the experiment and received compensation afterward.

3.2 Materials and Procedure

Awe manipulation. Following Piff et al. (2015), we manipulated awe through video viewing tasks. The positive awe group watched a clip from the BBC documentary *Earth: One Amazing Day* featuring beautiful natural landscapes. The threat-based awe group watched a clip from *Born for Destruction* featuring earthquakes, floods, and hurricanes. The control group watched a clip of wooden wardrobe assembly (Liu et al., 2022). Each video lasted approximately 2-3 minutes. After viewing, participants completed an emotion self-report scale adapted from Gross and Levenson (1995) for manipulation checks, rating their experience of six emotions (awe, wonder, happiness, joy, fear, anxiety) on a 7-point scale (1 = “does not describe my feelings at all,” 7 = “describes my feelings completely”). Awe level was represented by the average of awe and wonder ratings ($r = 0.54$), positive emotion by the average of happiness and joy ($r = 0.85$), and negative emotion by the average of fear and anxiety ($r = 0.64$; Wang et al., 2024).

Perceived resource scarcity manipulation. We manipulated perceived resource scarcity by having participants read fake articles (Pereira et al., 2022). Participants were randomly assigned to high or low perceived resource scarcity groups. The high scarcity group read: “In 2026, each country has scarce pandemic medical resources on average. The average pandemic medical resources of all countries globally can meet the needs of 19.60% of citizens, so medical resources for pandemic response are very scarce.” The low scarcity group read: “In 2026, each country has abundant pandemic medical resources on average. The average pandemic medical resources of all countries globally can meet the needs of 112.80% of citizens, so medical resources for pandemic response are very abundant.” After manipulation, we conducted manipulation checks using the perceived resource scarcity items from Study 1 (internal consistency coefficient = 0.88).

Finally, participants completed the common ingroup identity scale (same as Study 1, $r = 0.56$) and provided demographic information including age and gender.

3.3 Results

Manipulation Checks. A one-way ANOVA with emotion induction as the independent variable and participants' awe, positive emotion, and negative emotion as dependent variables revealed significant differences among positive awe, threat-based awe, and control groups in awe, $F(2, 213) = 18.22, p < 0.001, \eta^2 = 0.146$. Post-hoc comparisons showed that positive awe group awe scores ($M = 4.77, SD = 1.33$) were higher than control group ($M = 3.51, SD = 1.59, p_{\text{Bonferroni}} < 0.001, \text{Cohen's } d = 0.85$), and threat-based awe group scores ($M = 4.75, SD = 1.37$) were also higher than control group ($p_{\text{Bonferroni}} < 0.001, \text{Cohen's } d = 0.83$), but no significant difference existed between positive and threat-based awe groups ($p_{\text{Bonferroni}} = 0.999$). Significant differences emerged among groups in positive emotion, $F(2, 213) = 11.47, p < 0.001, \eta^2 = 0.097$. Positive awe group positive emotion scores ($M = 4.20, SD = 1.48$) were significantly higher than threat-based awe group ($M = 2.83, SD = 2.05, p_{\text{Tamhane's } T2} < 0.001, \text{Cohen's } d = 0.77$) and control group ($M = 3.52, SD = 1.53, p_{\text{Tamhane's } T2} = 0.021, \text{Cohen's } d = 0.45$). Significant differences also emerged in negative emotion, $F(2, 213) = 48.97, p < 0.001, \eta^2 = 0.315$. Threat-based awe group negative emotion scores ($M = 4.30, SD = 1.55$) were significantly higher than positive awe group ($M = 2.22, SD = 1.28, p_{\text{Bonferroni}} < 0.001, \text{Cohen's } d = 1.47$) and control group ($M = 2.35, SD = 1.38, p_{\text{Bonferroni}} < 0.001, \text{Cohen's } d = 1.33$). These results indicated successful manipulation of positive and threat-based awe.

A 3 (positive awe vs. threat-based awe vs. control) $\times 2$ (high vs. low perceived resource scarcity) between-subjects ANOVA on perceived resource scarcity manipulation check scores revealed no significant main effect of awe, $F(2, 210) = 0.77, p = 0.464$; a significant main effect of perceived resource scarcity, $F(1, 210) = 39.43, p < 0.001, \eta^2 = 0.158$, with the high scarcity group perceiving resources as scarcer ($M = 3.20, SD = 0.87$) than the low scarcity group ($M = 2.47, SD = 0.86, \Delta M = 0.73, \Delta M_{95\% \text{ CI}} = [0.51, 0.97]$); and no significant interaction between awe and perceived resource scarcity, $F(2, 210) = 2.25, p = 0.108$. These results indicated successful manipulation of perceived resource scarcity.

Differential Emotion Induction Across Awe Conditions. A one-way ANOVA with awe condition as the independent variable and happiness, joy, fear, and anxiety as dependent variables revealed significant differences among positive awe, threat-based awe, and control groups in these emotions (see Table 3). Therefore, happiness, joy, fear, and anxiety were controlled in subsequent analyses.

Table 3 Differential emotion induction across awe conditions in Study 2

	Positive awe vs. threat-based awe	Positive awe vs. control	Threat-based vs. control	M ± SD
Happiness	5.03	< 0.001	< 0.001	4.32 ± 1.47
Joy	< 0.001	4.09 ± 1.62	2.90 ± 2.20	3.53 ± 1.73
Fear	52.55	< 0.001	< 0.001	2.03 ± 1.29
Anxiety	25.34	< 0.001	< 0.001	2.41 ± 1.67

Note: F-tests, $df = (2, 213)$

Interaction Between Awe and Perceived Resource Scarcity. A 3 (positive awe vs. threat-based awe vs. control) × 2 (high vs. low perceived resource scarcity) between-subjects ANOVA was conducted with awe and perceived resource scarcity as independent variables, common ingroup identity as the dependent variable, and happiness, joy, fear, and anxiety as covariates. Results revealed a significant main effect of awe, $F(2, 206) = 13.48, p < 0.001, \eta^2 = 0.116$. Both positive awe and threat-based awe groups scored significantly higher on common ingroup identity than the control group ($M_{\text{control}} = 5.44, SD = 1.27, M_{\text{positive awe}} = 6.30, SD = 0.69, p < 0.001, \Delta M = 0.86, \Delta M_{95\% CI} = [0.51, 1.15]$; $M_{\text{threat-based awe}} = 5.94, SD = 0.87, p = 0.009, \Delta M = 0.50, \Delta M_{95\% CI} = [0.12, 0.85]$), with no significant difference between positive and threat-based awe groups ($p = 0.083$). The main effect of perceived resource scarcity was significant, $F(1, 206) = 8.30, p = 0.004, \eta^2 = 0.039$, with the high scarcity group scoring lower on common ingroup identity than the low scarcity group ($M_{\text{high scarcity}} = 5.69, SD = 1.08; M_{\text{low scarcity}} = 6.07, SD = 0.96, \Delta M = 0.38, \Delta M_{95\% CI} = [0.12, 0.64]$).

Importantly, the interaction between awe and perceived resource scarcity was significant, $F(2, 206) = 4.91, p = 0.008, \eta^2 = 0.045$. Simple effects analysis showed that in the positive awe group, perceived resource scarcity did not significantly affect common ingroup identity ($M_{\text{high scarcity}} = 6.20, SD = 0.80; M_{\text{low scarcity}} = 6.40, SD = 0.57$), $F(1, 206) = 0.50, p = 0.479$. In the control group, the difference remained non-significant ($M_{\text{high scarcity}} = 5.41, SD = 1.42; M_{\text{low scarcity}} = 5.46, SD = 1.14$), $F(1, 206) = 0.020, p = 0.889$. However, in the threat-based awe group, the high scarcity group scored significantly lower on common ingroup identity than the low scarcity group ($M_{\text{high scarcity}} = 5.47, SD = 0.74; M_{\text{low scarcity}} = 6.41, SD = 0.72$), $F(1, 206) = 17.48, p < 0.001, \Delta M = 0.94, \Delta M_{95\% CI} = [0.51, 1.41], \eta^2 = 0.078$. See Figure 2

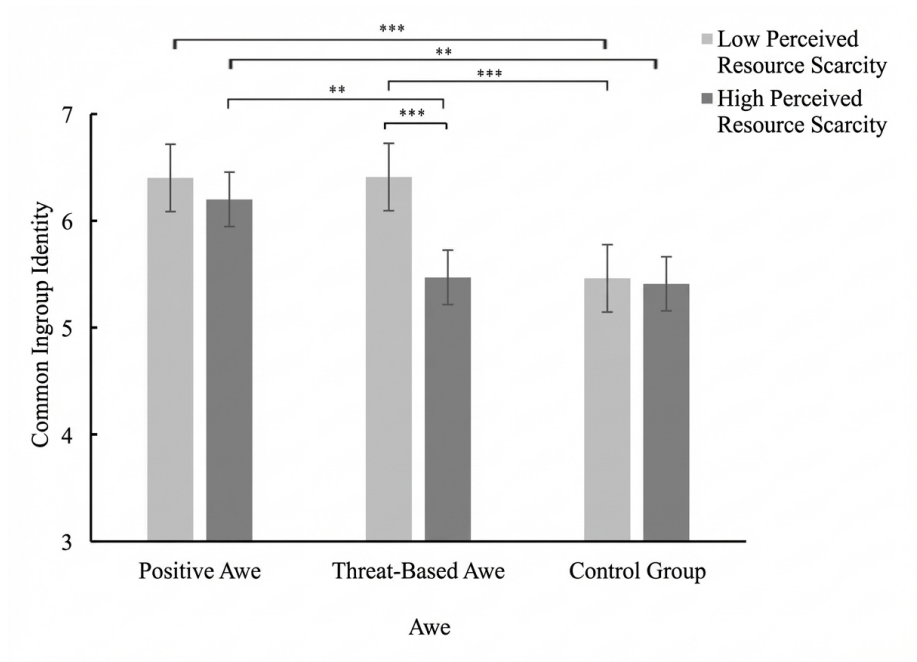


Figure 1: Figure 2

Figure 2 Effects of threat-based awe and perceived resource scarcity on common ingroup identity

Since previous research suggests threat-based awe is not a negative variant of awe but a composite emotion containing both fear and awe (Chaudhury et al., 2022), how does awe affect common ingroup identity if threat-based awe is treated as a composite emotion? A 3 (positive awe vs. threat-based awe vs. control) \times 2 (high vs. low perceived resource scarcity) between-subjects ANOVA was conducted with awe and perceived resource scarcity as independent variables, common ingroup identity as the dependent variable, and happiness, joy, and anxiety as covariates. Results revealed a significant main effect of awe, $F(2, 207) = 13.57$, $p < 0.001$, $\eta^2 = 0.116$. Both positive awe and threat-based awe groups scored significantly higher than the control group ($M_{\text{control}} = 5.44$, $SD = 1.27$, $M_{\text{positive awe}} = 6.30$, $SD = 0.69$, $p < 0.001$, $\Delta M = 0.86$, $\Delta M_{95\% \text{ CI}} = [0.51, 1.15]$; $M_{\text{threat-based awe}} = 5.94$, $SD = 0.87$, $p = 0.005$, $\Delta M = 0.50$, $\Delta M_{95\% \text{ CI}} = [0.15, 0.83]$), with no significant difference between positive and threat-based awe groups ($p = 0.062$). The main effect of perceived resource scarcity was significant, $F(1, 207) = 8.66$, $p = 0.004$, $\eta^2 = 0.040$, with the high scarcity group scoring lower than the low scarcity group ($M_{\text{high scarcity}} = 5.69$, $SD = 1.08$; $M_{\text{low scarcity}} = 6.07$, $SD = 0.96$, $\Delta M = 0.38$, $\Delta M_{95\% \text{ CI}} = [0.13,$

0.64]).

Importantly, the interaction between awe and perceived resource scarcity was significant, $F(2, 207) = 4.94$, $p = 0.008$, $\eta^2 = 0.046$. Simple effects analysis showed that in the positive awe group, perceived resource scarcity did not significantly affect common ingroup identity (Mhigh scarcity = 6.20, SD = 0.80; Mlow scarcity = 6.40, SD = 0.57), $F(1, 207) = 0.51$, $p = 0.476$. In the control group, the difference remained non-significant (Mhigh scarcity = 5.41, SD = 1.42; Mlow scarcity = 5.46, SD = 1.14), $F(1, 207) = 0.011$, $p = 0.915$. However, in the threat-based awe group, the high scarcity group scored significantly lower than the low scarcity group (Mhigh scarcity = 5.47, SD = 0.74; Mlow scarcity = 6.41, SD = 0.72), $F(1, 207) = 17.93$, $p < 0.001$, $\Delta M = 0.94$, $\Delta M_{95\% CI} = [0.51, 1.41]$, $\eta^2 = 0.080$. See Figure 3 [FIGURE:3].

Figure 3 Effects of awe as a composite emotion and perceived resource scarcity on common ingroup identity

3.4 Discussion

Study 2 results showed that whether threat-based awe is treated as a variant of awe or a composite emotion, both positive and threat-based awe promoted common ingroup identity, and high perceived resource scarcity inhibited threat-based awe's promoting effect on common ingroup identity, supporting Hypotheses 1 and 2. However, Studies 1 and 2 measured common ingroup identity using only the student identity, which was overly simplistic and confounded ethnic and student identities. Therefore, Study 3 revised measurement items to examine common ingroup identity by separately measuring student and Chinese national identities.

4 Study 3: The Effect of State Awe on Common Ingroup Identity: Based on Student and Chinese National Member Identities

Study 3 used student identity and Chinese national member identity as indicators of common ingroup identity to further verify the moderating effect of perceived resource scarcity on the relationship between awe and common ingroup identity, aiming to increase result reliability.

4.1 Participants and Design

This study used a two-factor between-subjects design: 3 (positive awe vs. threat-based awe vs. control) \times 2 (high vs. low perceived resource scarcity). The dependent variable was scores on the common ingroup identity scale.

Using G*Power 3.1 (Faul et al., 2009) to estimate sample size and referencing Preston and Shin's (2017) awe-related research, with significance level $\alpha = 0.05$ and medium effect size ($f = 0.25$), at least 158 participants were needed to

achieve 80% statistical power. The actual sample comprised 250 university students. After excluding invalid data, 220 valid responses remained (97 males, 123 females; 203 Han ethnicity, 17 ethnic minorities), achieving an actual statistical power of 91.97%. Participants' mean age was 20.65 ± 3.04 years. Sensitivity analysis indicated that this sample provided 80% power to detect an effect size of $f = 0.22$ or larger at a 5% false positive rate. Specifically, the positive awe-high scarcity group had 36 participants, positive awe-low scarcity group had 36; threat-based awe-high scarcity group had 39 participants, threat-based awe-low scarcity group had 37; control-high scarcity group had 36 participants, and control-low scarcity group had 36. All participants volunteered, had normal or corrected-to-normal vision, and no cognitive impairments. They provided informed consent and received compensation.

4.2 Materials and Procedure

First, awe was manipulated (same as Study 2). After viewing videos, participants completed the emotion self-report scale (same as Study 2), with correlation coefficients of 0.64, 0.88, and 0.68 respectively. Second, perceived resource scarcity was manipulated (same as Study 2), followed by manipulation checks (same as Study 2), with internal consistency coefficient of 0.86. Third, participants completed the common ingroup identity scale (Zhou et al., 2018), with the common ingroup described as “school” or “member of the Chinese nation.” Sample items included: “In our school, whether from this class or other classes, all are students of this university, and as a student of this university, I feel very happy,” “In our school, whether from this class or other classes, all are students of this university, and this identity is very important to me,” “Regardless of ethnicity, all are members of the Chinese nation, and as a member of the Chinese nation, I feel very happy,” and “Regardless of ethnicity, all are members of the Chinese nation, and this identity is very important to me.” The scale contained 4 items using a 7-point scale (1 = “strongly disagree,” 7 = “strongly agree”). The correlation coefficient for student identity-based common ingroup identity was 0.66, and for Chinese national member identity-based common ingroup identity was 0.78. Finally, participants provided demographic information.

4.3 Results

Manipulation Checks. A one-way ANOVA with emotion induction as the independent variable and participants' awe, positive emotion, and negative emotion as dependent variables revealed significant differences among positive awe, threat-based awe, and control groups in awe, $F(2, 217) = 25.69$, $p < 0.001$, $\eta^2 = 0.191$. Post-hoc comparisons showed that positive awe group awe scores ($M = 4.69$, $SD = 1.35$) were significantly higher than control group ($M = 3.14$, $SD = 1.59$, $p_{\text{Bonferroni}} < 0.001$, $\text{Cohen's } d = 1.05$), and threat-based awe group scores ($M = 4.62$, $SD = 1.46$) were also significantly higher than control group ($p_{\text{Bonferroni}} < 0.001$, $\text{Cohen's } d = 0.97$), with no significant difference between positive and threat-based awe groups ($p_{\text{Bonferroni}} = 0.999$). Significant dif-

ferences emerged among groups in positive emotion, $F(2, 217) = 27.23$, $p < 0.001$, $\eta^2 = 0.201$. Positive awe group positive emotion scores ($M = 4.03$, $SD = 1.52$) were significantly higher than threat-based awe group ($M = 2.14$, $SD = 1.68$, $p_{\text{Bonferroni}} < 0.001$, Cohen's $d = 1.18$) and control group ($M = 3.27$, $SD = 1.50$, $p_{\text{Bonferroni}} = 0.012$, Cohen's $d = 0.51$). Significant differences also emerged in negative emotion, $F(2, 217) = 71.54$, $p < 0.001$, $\eta^2 = 0.397$. Threat-based awe group negative emotion scores ($M = 4.35$, $SD = 1.53$) were significantly higher than positive awe group ($M = 2.08$, $SD = 1.09$, $p_{\text{Tamhane's T2}} < 0.001$, Cohen's $d = 1.69$) and control group ($M = 2.10$, $SD = 1.32$, $p_{\text{Tamhane's T2}} < 0.001$, Cohen's $d = 1.57$). These results indicated successful manipulation of positive and threat-based awe.

A 3×2 between-subjects ANOVA on perceived resource scarcity manipulation check scores revealed no significant main effect of awe, $F(2, 214) = 1.84$, $p = 0.162$; a significant main effect of perceived resource scarcity, $F(1, 214) = 45.35$, $p < 0.001$, $\eta^2 = 0.175$, with the high scarcity group perceiving resources as scarcer ($M = 3.19$, $SD = 0.81$) than the low scarcity group ($M = 2.49$, $SD = 0.73$, $\Delta M = 0.70$, $\Delta M_{95\% \text{ CI}} = [0.49, 0.90]$); and no significant interaction between awe and perceived resource scarcity, $F(2, 214) = 1.83$, $p = 0.162$. These results indicated successful manipulation of perceived resource scarcity.

Differential Emotion Induction Across Awe Conditions. A one-way ANOVA with awe condition as the independent variable and happiness, joy, fear, and anxiety as dependent variables revealed significant differences among positive awe, threat-based awe, and control groups (see Table 4). Therefore, happiness, joy, fear, and anxiety were controlled in subsequent analyses.

Table 4 Differential emotion induction across awe conditions in Study 3

	Positive awe Emotion vs. threat-based awe	Positive awe vs. control	Threat-based vs. control	M \pm SD
Happiness	32.71	< 0.001	< 0.001	4.17 \pm 1.55
Joy	19.06	< 0.001	< 0.001	3.90 \pm 1.60
Fear	88.75	< 0.001	< 0.001	1.99 \pm 1.14
Anxiety	31.81	< 0.001	< 0.001	2.18 \pm 1.39

Note: F-tests, $df = (2, 217)$

Interaction Between Awe and Perceived Resource Scarcity on Student Identity. A 3×2 between-subjects ANOVA was conducted with awe and perceived resource scarcity as independent variables, student identity as the dependent variable, and happiness, joy, fear, and anxiety as covariates. Results revealed a significant main effect of awe, $F(2, 210) = 17.73$, $p < 0.001$, $\eta^2 = 0.144$. Both positive awe and threat-based awe groups scored significantly higher than the control group ($M_{\text{positive awe}} = 6.27$, $SD = 0.69$, $M_{\text{control}} = 5.36$, $SD = 1.05$, $p < 0.001$, $\Delta M = 0.91$, $\Delta M95\% \text{ CI} = [0.57, 1.15]$; $M_{\text{threat-based awe}} = 5.79$, $SD = 0.90$, $p = 0.003$, $\Delta M = 0.43$, $\Delta M95\% \text{ CI} = [0.18, 0.91]$), with no significant difference between positive and threat-based awe groups ($p = 0.099$). The main effect of perceived resource scarcity was significant, $F(1, 210) = 10.13$, $p = 0.002$, $\eta^2 = 0.046$, with the high scarcity group scoring lower than the low scarcity group ($M_{\text{high scarcity}} = 5.60$, $SD = 1.01$; $M_{\text{low scarcity}} = 6.01$, $SD = 0.86$, $\Delta M = 0.41$, $\Delta M95\% \text{ CI} = [0.14, 0.61]$).

Importantly, the interaction between awe and perceived resource scarcity was significant, $F(2, 210) = 3.68$, $p = 0.027$, $\eta^2 = 0.034$. Simple effects analysis showed that in the positive awe group, perceived resource scarcity did not significantly affect student identity ($M_{\text{high scarcity}} = 6.19$, $SD = 0.76$; $M_{\text{low scarcity}} = 6.35$, $SD = 0.61$), $F(1, 210) = 0.26$, $p = 0.608$. In the control group, the difference remained non-significant ($M_{\text{high scarcity}} = 5.25$, $SD = 1.07$; $M_{\text{low scarcity}} = 5.47$, $SD = 1.03$), $F(1, 210) = 0.97$, $p = 0.327$. However, in the threat-based awe group, the high scarcity group scored significantly lower than the low scarcity group ($M_{\text{high scarcity}} = 5.38$, $SD = 0.93$; $M_{\text{low scarcity}} = 6.22$, $SD = 0.63$), $F(1, 210) = 16.80$, $p < 0.001$, $\Delta M = 0.84$, $\Delta M95\% \text{ CI} = [0.43, 1.21]$, $\eta^2 = 0.074$. See Figure 4 [FIGURE:4].

Figure 4 Effects of awe and perceived resource scarcity on student identity

Interaction Between Awe and Perceived Resource Scarcity on Chinese National Member Identity. A 3×2 between-subjects ANOVA was conducted with awe and perceived resource scarcity as independent variables, Chinese national member identity as the dependent variable, and happiness, joy, fear, and anxiety as covariates. Results revealed a significant main effect of awe, $F(2, 210) = 18.36$, $p < 0.001$, $\eta^2 = 0.149$. Both positive awe and threat-based awe groups scored significantly higher than the control group ($M_{\text{positive awe}} = 6.57$, $SD = 0.57$, $M_{\text{control}} = 5.74$, $SD = 0.91$, $p < 0.001$, $\Delta M = 0.83$, $\Delta M95\% \text{ CI} = [0.56, 1.11]$; $M_{\text{threat-based awe}} = 6.22$, $SD = 0.97$, $p = 0.039$, $\Delta M = 0.48$, $\Delta M95\% \text{ CI} = [0.02, 0.70]$), and positive awe group scored significantly higher than threat-based awe group ($p = 0.008$, $\Delta M = 0.35$, $\Delta M95\% \text{ CI} = [0.12, 0.83]$). The main effect of perceived resource scarcity was significant, $F(1, 210) = 6.87$, $p = 0.009$, $\eta^2 = 0.032$, with the high scarcity group scoring lower than the low scarcity group ($M_{\text{high scarcity}} = 6.02$, $SD = 0.97$; $M_{\text{low scarcity}} = 6.33$, $SD = 0.79$, $\Delta M = 0.31$, $\Delta M95\% \text{ CI} = [0.07, 0.51]$).

Importantly, the interaction between awe and perceived resource scarcity was significant, $F(2, 210) = 5.33$, $p = 0.006$, $\eta^2 = 0.048$. Simple effects analysis showed that in the positive awe group, perceived resource scarcity did not sig-

nificantly affect Chinese national member identity (Mhigh scarcity = 6.54, SD = 0.63; Mlow scarcity = 6.60, SD = 0.52), $F(1, 210) = 0.04$, $p = 0.839$. In the control group, the difference was also non-significant (Mhigh scarcity = 5.72, SD = 0.87; Mlow scarcity = 5.76, SD = 0.96), $F(1, 210) = 0.03$, $p = 0.854$. However, in the threat-based awe group, the high scarcity group scored significantly lower than the low scarcity group (Mhigh scarcity = 5.82, SD = 1.13; Mlow scarcity = 6.64, SD = 0.50), $F(1, 210) = 17.97$, $p < 0.001$, $\Delta M = 0.82$, $\Delta M95\% CI = [0.42, 1.17]$, $\eta^2 = 0.079$. See Figure 5 [FIGURE:5].

Figure 5 Effects of awe and perceived resource scarcity on Chinese national member identity

4.4 Discussion

Study 3 results were consistent with Study 2, showing that awe promotes common ingroup identity and that, compared with low perceived resource scarcity, individuals under high perceived resource scarcity showed lower identity with both student and Chinese national identities when experiencing threat-based awe. That is, high perceived resource scarcity inhibited threat-based awe's promoting effect on common ingroup identity, further supporting Hypotheses 1 and 2. However, Studies 2 and 3 used similar awe manipulation methods and common ingroup identity measures, so the stable results might be due to method consistency. To further verify result reliability, Study 4 changed the awe manipulation method and used Chinese National Identity Scale scores as the common ingroup identity measure to further examine awe's effect on common ingroup identity.

5 Study 4: The Effect of State Awe on Common Ingroup Identity: Based on Chinese National Identity

Study 4 used a recall-writing task to manipulate awe and measured common ingroup identity through the Chinese National Identity Scale to again verify the moderating effect of perceived resource scarcity on the relationship between awe and common ingroup identity.

5.1 Participants and Design

This study used a two-factor between-subjects design: 3 (positive awe vs. threat-based awe vs. control) \times 2 (high vs. low perceived resource scarcity). The dependent variable was scores on the Chinese National Identity Scale.

Using G*Power 3.1 (Faul et al., 2009) to estimate sample size and referencing Preston and Shin's (2017) awe-related research, with significance level $\alpha = 0.05$ and medium effect size ($f = 0.25$), at least 158 participants were needed to achieve 80% statistical power. The actual sample comprised 255 university students. After excluding invalid data, 220 valid responses remained (72 males, 148 females; 175 Han ethnicity, 45 ethnic minorities), achieving an actual statistical

power of 91.97%. Participants' mean age was 19.46 ± 4.75 years. Sensitivity analysis indicated that this sample provided 80% power to detect an effect size of $f = 0.21$ or larger at a 5% false positive rate. Specifically, the positive awe-high scarcity group had 39 participants, positive awe-low scarcity group had 36; threat-based awe-high scarcity group had 36, threat-based awe-low scarcity group had 35; control-high scarcity group had 36, and control-low scarcity group had 38. All participants volunteered, had normal or corrected-to-normal vision, and no cognitive impairments. They provided informed consent and received compensation.

5.2 Materials and Procedure

First, we manipulated awe using a recall-writing paradigm (Gordon et al., 2017). Participants were assigned to positive awe, threat-based awe, or control groups and read the following instructions. Positive awe manipulation materials: "Awe is an intense feeling of respect and fear. Typically, we feel awe toward vast beautiful scenery and natural wonders, such as towering mountains, vast landscapes, or magnificent waterfalls. We also feel awe toward people who bring about major changes, such as Nelson Mandela and his role in ending racial division in South Africa." Threat-based awe manipulation materials: "Awe is an intense feeling of respect and fear. Typically, we feel awe toward natural disasters such as earthquakes, hurricanes, or volcanic eruptions. We also feel awe toward people who cause massive destruction, such as Hitler and his enormous terrifying role in World War II." Control group participants read materials related to daily life. After reading, positive awe and threat-based awe groups were asked to recall similar awe experiences from their past, while the control group recalled events from that day from morning to night, describing them in at least 5 sentences. After the recall-writing task, participants completed the emotion self-report scale (same as Study 2), with correlation coefficients of 0.57, 0.67, and 0.50 respectively.

Second, perceived resource scarcity was manipulated and checked (same as Study 2), with internal consistency coefficient of 0.81.

Third, participants completed the Chinese National Identity Scale (Phinney & Ong, 2007), with "ethnic group" wording changed to "Chinese nation," such as "I have a strong sense of belonging to the Chinese nation." The scale contains 6 items across exploration and commitment dimensions using a 6-point scale (1 = "strongly disagree," 6 = "strongly agree"), with higher scores indicating stronger Chinese national identity. Internal consistency coefficient was 0.73. Finally, participants provided demographic information.

5.3 Results

Manipulation Checks. A one-way ANOVA with emotion induction as the independent variable and participants' awe, positive emotion, and negative emotion as dependent variables revealed significant differences among positive awe,

threat-based awe, and control groups in awe, $F(2, 217) = 18.27, p < 0.001, \eta^2 = 0.144$. Post-hoc comparisons showed that positive awe group awe scores ($M = 4.09, SD = 1.33$) were significantly higher than control group ($M = 3.11, SD = 1.10, p_{\text{Bonferroni}} < 0.001, \text{Cohen's } d = 0.80$), and threat-based awe group scores ($M = 4.22, SD = 1.21$) were also significantly higher than control group ($p_{\text{Bonferroni}} < 0.001, \text{Cohen's } d = 0.96$), with no significant difference between positive and threat-based awe groups ($p_{\text{Bonferroni}} = 0.999$). Significant differences emerged among groups in positive emotion, $F(2, 217) = 7.38, p < 0.001, \eta^2 = 0.064$. Positive awe group positive emotion scores ($M = 4.39, SD = 1.34$) were significantly higher than threat-based awe group ($M = 3.61, SD = 1.58, p_{\text{Tamhane's } T2} = 0.005, \text{Cohen's } d = 0.56$) and control group ($M = 3.68, SD = 1.16, p_{\text{Tamhane's } T2} = 0.002, \text{Cohen's } d = 0.57$). Significant differences also emerged in negative emotion, $F(2, 217) = 16.82, p < 0.001, \eta^2 = 0.134$. Threat-based awe group negative emotion scores ($M = 4.02, SD = 1.11$) were significantly higher than positive awe group ($M = 3.21, SD = 1.22, p_{\text{Bonferroni}} < 0.001, \text{Cohen's } d = 0.69$) and control group ($M = 2.97, SD = 1.09, p_{\text{Bonferroni}} < 0.001, \text{Cohen's } d = 0.95$). These results indicated successful manipulation of positive and threat-based awe.

A 3×2 between-subjects ANOVA on perceived resource scarcity manipulation check scores revealed no significant main effect of awe, $F(2, 214) = 0.72, p = 0.488$; a significant main effect of perceived resource scarcity, $F(1, 214) = 42.39, p < 0.001, \eta^2 = 0.165$, with the high scarcity group perceiving resources as scarcer ($M = 3.33, SD = 0.71$) than the low scarcity group ($M = 2.71, SD = 0.72, \Delta M = 0.62, \Delta M_{95\% \text{ CI}} = [0.44, 0.82]$); and no significant interaction between awe and perceived resource scarcity, $F(2, 214) = 2.09, p = 0.127$. These results indicated successful manipulation of perceived resource scarcity.

Differential Emotion Induction Across Awe Conditions. A one-way ANOVA with awe condition as the independent variable and happiness, joy, fear, and anxiety as dependent variables revealed significant differences among positive awe, threat-based awe, and control groups (see Table 5). Therefore, happiness, joy, fear, and anxiety were controlled in subsequent analyses.

Table 5 Differential emotion induction across awe conditions in Study 4

	Positive awe Emotion vs. threat-based awe	Positive awe vs. control	Threat-based vs. control	M \pm SD
Happiness	0.001	4.41 \pm 1.38	3.55 \pm 1.80	3.62 \pm 1.26
Joy	4.74	< 0.001	< 0.001	4.36 \pm 1.51
Fear	23.25	< 0.001	< 0.001	2.89 \pm 1.21

Positive awe Emotion vs. threat-based awe	Positive awe vs. control	Threat-based vs. control	M ± SD
Anxiety < 0.001	< 0.001	< 0.001	3.52 ± 1.56

Note: F-tests, $df = (2, 217)$

Interaction Between Awe and Perceived Resource Scarcity. A 3×2 between-subjects ANOVA was conducted with awe and perceived resource scarcity as independent variables, Chinese national identity as the dependent variable, and happiness, joy, fear, and anxiety as covariates. Results revealed a significant main effect of awe, $F(2, 210) = 5.76$, $p = 0.004$, $\eta^2 = 0.052$. Positive awe and threat-based awe groups scored significantly higher than the control group ($M_{\text{positive awe}} = 4.79$, $SD = 0.58$, $M_{\text{control}} = 4.46$, $SD = 0.45$, $p < 0.001$, $\Delta M = 0.33$, $\Delta M_{95\% \text{ CI}} = [0.12, 0.47]$). Threat-based awe group Chinese national identity scores did not differ significantly from the control group, $M_{\text{threat-based awe}} = 4.56$, $SD = 0.65$, $p = 0.243$, and positive awe group scores were marginally significantly higher than threat-based awe group ($p = 0.051$). The main effect of perceived resource scarcity was significant, $F(1, 210) = 20.97$, $p < 0.001$, $\eta^2 = 0.091$, with the high scarcity group scoring lower than the low scarcity group ($M_{\text{high scarcity}} = 4.46$, $SD = 0.55$; $M_{\text{low scarcity}} = 4.75$, $SD = 0.57$, $\Delta M = 0.29$, $\Delta M_{95\% \text{ CI}} = [0.19, 0.47]$).

Importantly, the interaction between awe and perceived resource scarcity was significant, $F(2, 210) = 10.30$, $p < 0.001$, $\eta^2 = 0.089$. Simple effects analysis showed that in the positive awe group, perceived resource scarcity did not significantly affect Chinese national identity ($M_{\text{high scarcity}} = 4.71$, $SD = 0.55$; $M_{\text{low scarcity}} = 4.88$, $SD = 0.61$), $F(1, 210) = 1.78$, $p = 0.183$. In the control group, the difference remained non-significant ($M_{\text{high scarcity}} = 4.45$, $SD = 0.36$; $M_{\text{low scarcity}} = 4.47$, $SD = 0.52$), $F(1, 210) = 0.08$, $p = 0.780$. However, in the threat-based awe group, the high scarcity group scored significantly lower than the low scarcity group ($M_{\text{high scarcity}} = 4.20$, $SD = 0.60$; $M_{\text{low scarcity}} = 4.93$, $SD = 0.48$), $F(1, 210) = 37.10$, $p < 0.001$, $\Delta M = 0.73$, $\Delta M_{95\% \text{ CI}} = [0.53, 1.04]$, $\eta^2 = 0.150$. See Figure 6 [FIGURE:6].

Figure 6 Effects of awe and perceived resource scarcity on Chinese national identity

5.4 Discussion

Study 4 changed the awe manipulation method and used the Chinese National Identity Scale to measure common ingroup identity, with results consistent with Studies 2 and 3.

6 General Discussion

This article revealed the effects of awe and perceived resource scarcity on common ingroup identity through four studies. Study 1 used questionnaires to examine relationships among trait awe, perceived resource scarcity, and common ingroup identity. Studies 2–4 manipulated awe and perceived resource scarcity, using different common ingroup identity measures to further examine the effects of state awe and perceived resource scarcity on common ingroup identity. For trait awe, results showed that awe positively predicted common ingroup identity, with perceived resource scarcity playing a moderating role—high perceived resource scarcity weakened the promoting effect of trait awe on common ingroup identity. For state awe, under high perceived resource scarcity, only positive awe promoted common ingroup identity, whereas under low perceived resource scarcity, both positive and threat-based awe promoted common ingroup identity.

6.1 Theoretical and Practical Implications

First, this study reveals awe's promoting effect on common ingroup identity, supporting the Common Ingroup Identity Model. The model suggests that intergroup interdependence, group distinctiveness, context, and pre-contact experiences affect individuals' cognitive representation of membership (Gaertner et al., 1993). Among pre-contact experiences, emotional priming influences recategorization (Gaertner et al., 1993). For example, similar emotional responses to common events enhance categorization of self as a group member (van Kleef & Fischer, 2016). This result is also supported by previous research (Seo et al., 2023).

Study 3 found that both positive and threat-based awe promoted common ingroup identity in both Chinese national and student identities, supporting Hypothesis 1. Additionally, positive and threat-based awe showed inconsistent patterns between Chinese national and student identities: positive awe produced higher Chinese national identity than threat-based awe, while no significant difference emerged for student identity. This may be because when facing threat-based awe such as floods, earthquakes, and hurricanes, individuals seek belonging and security by connecting with more powerful groups.

Second, the finding that awe facilitates common ingroup identity provides more direct and effective evidence for awe's promotion of intergroup relations. Previous research on awe's effect on intergroup relations focused primarily on reducing stereotypes (Luo et al., 2022) or increasing prosocial behavior (Vingerhoets et al., 2016) through enhanced connectedness, with few studies examining promotion of intergroup relations through changed group identity representation. This study explored awe's promoting effect on common ingroup identity, which constructs a superordinate identity that transforms former outgroup members into ingroup members, not only reducing outgroup bias but also enhancing ingroup favoritism, thereby more directly and effectively promoting intergroup

relations.

Third, this study addresses when awe is more conducive to common ingroup identity, helping better understand awe' s promoting effect on intergroup relations while accumulating experience for crisis response. Study 1 found that high perceived resource scarcity buffered the effect of trait awe on common ingroup identity. Studies 2-4 further revealed that under positive awe, common ingroup identity did not differ between high and low perceived resource scarcity, whereas high perceived resource scarcity inhibited threat-based awe' s promoting effect on common ingroup identity. This is supported by previous research (Miao et al., 2023). For instance, Miao et al. (2023) found that under low common threat, high and low perceived resource scarcity groups did not differ in intergroup cooperation, while high perceived resource scarcity weakened common threat' s promoting effect on intergroup cooperation. According to the Common Ingroup Identity Model, intergroup cooperation promotes common ingroup identity (Gaertner et al., 1993). This also aligns with empirical observations from the pandemic: in the early stages, people cooperated with home isolation policies, but after prolonged isolation, perceived inconvenience and resource scarcity led to more negative attitudes toward isolation.

Perceived resource scarcity only moderated the relationship between threat-based awe and common ingroup identity, possibly because the scarcity manipulation materials were unrelated to positive awe induction materials. In Studies 2-4, perceived resource scarcity was manipulated through perceived scarcity of survival resources in a pandemic context, while positive awe was induced through viewing magnificent natural landscapes (Studies 2-3) or recalling vast natural scenery (Study 4), which are unrelated to perceived survival resource scarcity. Therefore, under positive awe, high perceived resource scarcity group common ingroup identity scores were lower than but not significantly different from the low scarcity group. However, perceived survival resource scarcity is related to threats from earthquakes, floods, and hurricanes, so under high perceived resource scarcity, especially following the COVID-19 pandemic, threat-based awe induction made participants' experiences more vivid, focusing attention on scarce resources and personal interests, thereby reducing awe-induced small self feelings and self-transcendence and hindering awe' s promoting effect on common ingroup identity.

Fourth, although some scenarios that induce perceived resource scarcity, such as pandemics, may also induce threat-based awe, perceived resource scarcity and threat-based awe are fundamentally distinct concepts. Threat-based awe emphasizes an intense emotional experience of fear and wonder when facing threats (Gordon et al., 2017; Li et al., 2024; Zhao et al., 2023), whereas perceived resource scarcity emphasizes subjective feelings that available resources cannot meet needs (Mullainathan & Shafir, 2013). Watching videos of floods, earthquakes, and hurricanes may induce threat perception and fear/awe emotions without necessarily creating feelings of resource insufficiency, thus not necessarily inducing perceived resource scarcity. Previous research showing

that perceived resource scarcity moderates the relationship between earthquake-based common threat and intergroup cooperation (Miao et al., 2023) indirectly demonstrates that perceived resource scarcity and threat-based awe are independent concepts. Furthermore, in Studies 2–4 manipulation checks, ANOVAs on perceived resource scarcity with awe as the independent variable showed no significant main effect of awe and no significant interaction between awe and perceived resource scarcity, further indicating that threat-based awe did not cause perceived resource scarcity in this study.

Fifth, regarding the concept of threat-based awe, it includes both a variant of awe and a composite emotion (Chaudhury et al., 2022; Gordon et al., 2017; Keltner & Haidt, 2003). Keltner and Haidt (2003) proposed that characteristics of awe-eliciting objects may lead to different awe variants. For example, awe toward individuals demonstrating exceptional abilities includes admiration and belongs to positive awe, whereas awe induced by hurricanes, earthquakes, and floods includes fear and belongs to negative awe. Recent research suggests threat-based awe is a composite emotion containing both positive and negative components (Chaudhury et al., 2022). Chaudhury et al. (2022) found that threat-based awe is perceived as a combination of awe and fear. This study found that whether threat-based awe is treated as a negative variant or composite emotion, it can promote common ingroup identity, with perceived resource scarcity playing a moderating role.

This may be because fear can induce a sense of grandeur that makes the self feel smaller (Vasey et al., 2012), consistent with the self-diminishment hypothesis of awe (Jiang et al., 2024; Seo et al., 2023). “Small self” feelings motivate individuals to integrate into social collectives (Chen & Boucher, 2008), enhance unity with others to satisfy belongingness (Waugh & Fredrickson, 2006), and alleviate inner loneliness and helplessness (Stellar et al., 2017). Additionally, under high perceived resource scarcity, fear motivates individuals to develop self-preservation behaviors to cope with threats (Öhman, 2008), focusing more on self-needs and thereby reducing common ingroup identity.

Sixth, this study’s finding that awe promotes common ingroup identity has implications for educational practice. Educators should inspire students’ awe toward Chinese national culture, natural wonders, historical events, and national spirit, allowing students to fully experience the nation’s vast territory, inclusive and reserved culture, world-embracing spirit, and resilient national character, thereby enhancing cultural confidence and identification with the common ingroup—the Chinese nation. Simultaneously, educators should present vast natural landscapes and cultures of different countries and ethnic groups to inspire identification with a human community with a shared future, enhancing students’ sense of global responsibility and prosocial behavior, strengthening cooperation, and improving risk response capabilities.

Furthermore, the finding that high perceived resource scarcity inhibits awe’s promoting effect on common ingroup identity, particularly for threat-based awe, suggests that organizational managers should pay attention to resource distri-

bution fairness in resource-scarce social environments, especially when facing floods, tsunamis, and pandemics, to avoid group competition and low common ingroup identity caused by unequal resource possession.

6.2 Limitations and Future Directions

First, this study only measured explicit common ingroup identity using “student” and “Chinese national identity,” which is relatively simplistic and makes it difficult to examine common ingroup identity at the behavioral level. Additionally, the examined “student” identity was weakly associated with awe induction, and explicit Chinese national identity measurement may be subject to social desirability effects. Future research should adopt more diverse methods to measure common ingroup identity, such as social distance, relational intimacy, and feeling thermometers (Zhu et al., 2024), and examine different common ingroup identities such as citizen identity, national identity, and provincial/city identity. Additionally, implicit common ingroup identity could be measured through IAT or GNAT tests, and behavioral measures such as resource allocation could be used to examine common ingroup identity at the behavioral level.

Second, this study’s sample comprised university students, without examining the relationship between awe and common ingroup identity among adolescents. Li et al. (2024) suggest that adolescents have higher self-centeredness, focusing more on themselves than the outside world. Does awe also benefit common ingroup identity among adolescents? Future research could use adolescent samples to further examine the relationship between awe and common ingroup identity.

Third, the relationship between awe and common ingroup identity may be moderated by variables other than perceived resource scarcity, such as culture. Collectivist cultures emphasize group harmony, whereas individualist cultures focus on individual experience, which may affect the relationship between awe and common ingroup identity. Future research could further explore moderating effects to more comprehensively understand awe’s influence on common ingroup identity.

Fourth, this study manipulated perceived resource scarcity through perceived scarcity of survival resources in a pandemic context and positive awe through natural landscape videos. However, the connection between pandemic-related medical resource scarcity and natural landscapes is not close, which may explain why perceived resource scarcity did not moderate the effect of positive awe. Additionally, manipulating perceived scarcity of medical resources in a pandemic context might induce threat-based awe. Future research could manipulate perceived resource scarcity using natural resource scarcity, such as natural landscape disappearance due to global warming, to further explore the moderating effect of perceived resource scarcity.

This study reached the following conclusions: First, awe promotes common ingroup identity. Second, perceived resource scarcity moderates awe’s promoting effect on common ingroup identity—high perceived resource scarcity weakens

trait awe' s promoting effect on common ingroup identity and inhibits threat-based awe' s promoting effect on common ingroup identity.

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