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Hiding Uncertain Me in the Crowd: Avoidance-Oriented Affiliation Defense to Self-Uncertainty

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Purpose: This study explored how individuals cope with self-uncertainty by subconsciously affiliating with groups. Specifically, we investigated whether this affiliation is driven by avoiding isolation rather than pursuing group identity or entitativity.

Methods: In Study 1, we recruited 50 undergraduate students and employed the Affect Misattribution Procedure (AMP) to measure implicit attitudes toward affiliation and isolation after inducing self-uncertainty. In Study 2, 70 participants were presented with images of abstract human avatars representing different group sizes to assess their preference for group affiliation under conditions of induced self-uncertainty.

Results: Study 1 revealed that individuals experiencing self-uncertainty exhibited a significantly more negative implicit attitude towards isolation than affiliation, with no significant positive shift towards group affiliation. Study 2 further supported these findings by demonstrating a pronounced tendency for self-uncertain individuals to prefer larger, cohesive groups (affiliation) and to report greater feelings of safety within such groups, indicating avoidance of isolation as a critical driver.

Conclusion: The findings suggest that individuals experiencing self-uncertainty instinctively seek refuge in groups as a defense mechanism against isolation rather than for identity validation. This avoidance-oriented affiliation underscores a fundamental psychological process for managing self-uncertainty, highlighting the importance of social proximity in alleviating feelings of insecurity.

Keywords: self-uncertainty, affiliation, avoidance-oriented, fundamental defense

Introduction

It is a universal human experience to go through periods of uncertainty in one's own life. Uncertainty diminishes the ability to make accurate predictions, undermines the fundamental principles of existence, and particularly causes discomfort regarding the self.[1–3] Self-uncertainty refers to the subjective ambiguity or confusion about one's thoughts, feelings, values, or behaviors.[4,5] It arises when individuals are unsure about their self-concept or are experiencing conflicting internal cues, leading to discomfort and a desire for clarity.[6] The experience of self-uncertainty is aversive and triggers stress reactions while also driving actions aimed at reducing self-uncertainty,[7,8] often driving them to seek stability and affirmation from external sources.[9] One of the most effective ways is joining a group.[9,10]

Uncertainty-Identity Theory posits that individuals are motivated to reduce feelings of uncertainty, particularly about the self, by identifying with clearly defined and highly entitative groups.[9] High entitativity groups are seen as having clear boundaries, interdependence among members, and a shared identity, providing a solid sense of identity and a worldview that enhances predictability and control over the social environment,[8] making them more attractive to self-uncertain individuals seeking clarity and stability.[11] The theory has been supported by numerous studies that people who

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feel self-uncertain seek membership in a group or identify more strongly with an existing self-inclusive group,[12] and widely applied to understand behaviors in contexts of social uncertainty, such as group polarization and conformity.[10]

Uncertainty-Identity Theory suggests a first route people travel to reduce self-uncertainty: They identify with the group to validate their self-concept and restore their sense of predictability of the world.[13] This cognitive pathway has been proven to be a powerful device for managing self-uncertainty.[14] Especially in collectivist cultures, where the self is often defined in relation to others, individuals are more likely to affiliate with groups to maintain self-identity.[15] However, beyond providing a shared identity or worldview, groups may also offer a fundamental level of protection, particularly under conditions of self-uncertainty.[12] While previous research has extensively explored identification with high-entitativity groups, there is limited understanding of whether physical proximity to a general group—regardless of its entitativity—can also serve as a coping mechanism for self-uncertainty. In addition to using higher cognitive processes to cope with uncertainty, we propose that individuals may also employ a more fundamental route by seeking physical proximity to a group for a sense of safety and comfort when faced with self-uncertainty.

Threats and Groups

Like most primates, humans tend to live in groups. Groups offer psychological security and provide the essential resources for survival. Affiliation to groups serves crucial evolutionary purposes, with the primary benefit being enhanced defense against environmental dangers.[16,17] From an evolutionary perspective, humans have evolved some powerful psychological mechanisms to ensure that individuals "maximize the association between themselves and their social group and minimize the danger of becoming isolated or expelled from the group".[18] Especially in life-threatening situations, self-protecting individuals desire to "bind together" as there is "safety in numbers".[3,19] Presently, individuals seek proximity to others when they perceive a sense of danger, even without any observable physical harm.[18,20]

Given the potential threat and anxiety caused by self-uncertainty,[1] which leads to increased physiological arousal and stress reaction,[7] we are interested in exploring whether individuals cope with the danger of self-uncertainty affiliation with a group (independent of any pre-existing group attributes). Affiliation refers to the tendency of individuals to seek closeness, association, or membership with others, particularly in times of stress or uncertainty. It is a fundamental social behavior motivated by the desire for social support, security, and validation.[17] Affiliation serves as a coping mechanism, providing individuals with a sense of belonging and reducing stress.[21]

Affiliation and Security

Multiple studies have demonstrated that affiliation with a group provides individuals with a sense of security and defense, leading them to seek shelter in crowds when confronted with threats.[22–24] For example, existential concerns caused a heightened inclination to seek closer proximity to others,[22] even if others entail a simultaneous risk to their worldview.[23] Similarly, the presence of large and cohesive groups makes people buffer death anxiety and feel safer outside a specific cultural context.[20] Moreover, neuroendocrine evidence suggests that a bio-behavioral mechanism involving oxytocin is responsible for this tend-and-befriend pattern observed in reaction to psychological stress.[24] In turn, affiliation reduces anxiety through the neuroendocrine process.[7]

Some studies further suggest that the link between affiliation and security may be driven by unconscious mechanisms that are not reliant on socially shared symbolic interpretations. For instance, research has demonstrated that interpersonal contact can provide a sense of security. Specifically, when individuals were reminded of their deaths, they had reduced anxiety after receiving interpersonal touch.[25] In addition, after an incidental pat on the back from an experimenter they had just met, participants felt more secure and made riskier financial decisions.[26] Finally, experiments indicate that people could manage self-uncertainty through physiological processes by holding something soft.[27] Such observations suggest, albeit indirectly, that the uncertain management effects of affiliation derive, at least in part, from sub-cognitive and even physiological processes,[27] which operate independently of symbolic meanings.[20] Thus, the intriguing possibility arises that in addition to getting a shared identity or worldview from the group, people may also cope with uncertainty by obtaining refuge from affiliation with crowds. These are the two somewhat different ways individuals protect themselves against uncertainty.

Based on this research, we explore an additional route that, although unexplored by scientific investigation, may constitute an equally helpful tool for uncertainty reduction. Specifically, we propose that when people are confronted with their self-uncertainty, in addition to using the identity or worldview from a group to cope with uncertainty, they may resort to the shelter of a group to alleviate the discomfort caused by uncertainty and obtain feelings of safety. This process of seeking affiliation can serve as a fundamental mechanism for dealing with self-uncertainty, operating subconsciously without the involvement of higher cognitive processes.

Furthermore, the well-studied identity or worldview-based affiliation is approach-oriented, where individuals join groups to obtain positive outcomes like social support and validation. Beyond group affiliation, other psychological defense mechanisms, such as self-enhancement and self-verification, are also employed to manage self-uncertainty by inflating their positive qualities to counteract self-doubt.[5] In contrast to these mechanisms, this study focuses on a distinct pathway in which individuals seek group affiliation not for self-enhancement or validation but to avoid the psychological discomfort associated with being alone or unprotected.[28] Unlike approach-oriented affiliation, which seeks positive social connections, we propose that avoidance-oriented affiliation is a basic safety-seeking behavior driven by a desire to escape self-uncertainty discomforts, such as social isolation and anxiety.[29] This distinction is crucial, as it expands our understanding of group affiliation beyond pursuing positive social identity benefits by introducing a defensive, safety-driven dimension.[1] We hypothesized that avoidance-oriented affiliation to a group lacking inherent group attributes could offer refuge, a sense of protection, and alleviation of self-uncertainty.

The Present Research and Hypotheses

Our current studies extend beyond the commonly studied social identity and worldview hypothesis by demonstrating that group affiliation is a fundamental mechanism for managing self-uncertainty. This mechanism operates subconsciously and extends beyond the group's identity and worldview, aligning with broader theories of uncertainty management that emphasize the role of cognitive and non-cognitive processes.[6,9] Previous research has consistently shown that self-uncertainty drives individuals to seek clarity and stability, often through group membership and social identity.[5,12] However, our studies suggest that individuals also engage in a more basic, sub-cognitive form of affiliation driven by the desire to avoid the discomfort of isolation.[17,23] This aligns with the dual-process model of social behavior, which posits that both automatic and deliberate processes guide human actions.[30,31]

The objective of Study 1 was to investigate how this subconscious and automatic mechanism of dealing with self-uncertainty leads to affiliation. Explicit self-report measures require a deliberative process and may fail to capture these automatic evaluations that drive downstream behaviors.[32] Therefore, we utilized the Affect Misattribution Procedure (AMP), a widely used indirect measure that assesses implicit attitudes by examining the misattribution of effect.[33–35] The AMP has been employed in numerous experiments to measure the subconscious activation of motives and attitudes.[35] Study 1 used the AMP to measure the implicit motive for affiliation following self-uncertainty induction.

Previous research has yet to determine the motivation behind affiliation defense due to their reliance on result-oriented paradigms. For instance, during a threat situation, the level of affiliation with a group was assessed by seeing individuals sitting together in a seating arrangement[23] or showing favoritism towards their in-group.[36] Considering that affiliation may be driven by both approach-oriented (seeking positive outcomes from group inclusion) and avoidance-oriented motivations (evading the negative consequences of isolation),[23,31] we measured both implicit motives in this study. AMP was chosen for this study because it allows for assessing participants' implicit attitudes towards affiliation and isolation without requiring deliberate and conscious reflection. Given that our research aims to investigate the automatic, instinctive responses to self-uncertainty, the AMP is particularly suited to capture the spontaneous, non-deliberative evaluations critical to understanding avoidance-oriented affiliation. By capturing these subtle, automatic reactions, the AMP provides insights into whether individuals are motivated by an approach-oriented desire for group inclusion or an avoidance-oriented need to escape isolation. This aligns with our research objective of understanding whether individuals, when faced with self-uncertainty, automatically gravitate towards groups to avoid isolation rather than actively seek social approval or acceptance. We predicted that induced self-uncertainty would lead to more positive implicit evaluations of affiliation and negative isolation assessments (H1) because avoidance-oriented affiliation is characterized by a defensive motivation to evade negative experiences, such as anxiety caused by self-uncertainty.[17,37]

To further explore the effects of implicit attitudes of affiliation and isolation triggered by self-uncertainty, Study 2 examined whether these attitudes would increase individuals' tendency to seek group affiliation and whether such affiliation could mitigate the uncertainty. Given the goal of this study to demonstrate that individuals, when faced with self-uncertainty, instinctively seek group affiliation not for identity or acceptance but to avoid isolation and find safety, abstract human avatars were used to represent groups. By presenting participants with abstract representations of groups, this study tests whether the preference for larger, more cohesive groups under self-uncertainty reflects an avoidance-oriented motivation to evade isolation rather than a mere approach-oriented desire for social inclusion. These avatars do not convey any specific identity, making them ideal for testing the hypothesis that individuals will still gravitate towards more extensive, more cohesive groups as a defensive mechanism, even without evident group characteristics. This aligns with previous research, which showed that abstract representations can evoke feelings of safety when emphasizing group size and cohesiveness.[20] We hypothesized that self-uncertainty would enhance the preference for affiliating with a group, even if it is represented abstractly. Using these abstract figures allowed us to control for identity-related influences and focus purely on avoiding isolation as a motive. We predicted that individuals would perceive larger and more cohesive groups as safer and more inclined to affiliate with them when confronted with self-uncertainty (H2).

Study 1

Materials and Methods

Participants

We recruited 50 participants from a university in Beijing between March 2023 (24 males, 26 females, all Chinese native speakers, M_{age} = 19.68 years, SD = 0.99). The participants were enrolled in a mental health course, a requirement for every undergraduate student. Participants were recruited during the course sessions and were informed about the study's purpose. Exclusion criteria involved any prior diagnosis of severe mental illness, participation in similar psychological studies within the past six months, or a lack of consent to participate in the study. All subjects signed informed consent for this investigation, and each participant received 30 RMB as compensation for their time and effort. Using G*Power 3.1,[38] we determined that the current sample size was sufficient to obtain adequate power ($1 - \beta > 0.85$) to detect a medium-sized effect ($f = 0.25$).

Procedure and Design

The participants were assigned to a 2 (Condition: Self-uncertainty versus Self-Certainty) × 2 (Prime Type: Affiliation versus Isolation) two-factor mixed design. The prime type was the between-subjects factor, and the condition was the within-subjects factor. The dependent variable was the implicit attitude, operationalized as the pleasantness score of the target pictograph. This study and the following study were conducted following the ethical standards of the institutional research committee and the Helsinki Declaration. Both studies were reviewed and approved by the Medical Ethics Committee of Northwest University (approval No. 221111001).

Participants were randomly assigned to either the uncertainty or certainty condition. Upon entering the laboratory, participants were instructed to complete a booklet with two ostensibly unrelated studies. The self-uncertainty/certainty manipulation followed a widely-used paradigm in uncertainty research, wherein participants were given five minutes to recall, re-experience, and describe in writing a previous situation in which they felt either uncertain (uncertainty-prime condition) or certain (certainty-prime condition).[37,39] This manipulation was pretested among 55 participants, who were then asked to rate their current feelings on three seven-point scales anchored at "unsure/sure", "do not feel confident/feel confident", and "hesitant/determined".[40] The pretest results indicated that participants primed with self-uncertainty reported significantly lower certainty and confidence (M = 4.51, SD = 0.61) than those primed with self-certainty (M = 5.41, SD = 0.43; t (53) = −6.23, $p < 0.001$), confirming the effectiveness of the manipulation. Additionally, participants rated their emotions on two five-point scales anchored at "relax/nervous" and "easy/anxiety" ($\alpha = 0.90$). This step aimed to verify that the observed effects were due to the manipulations themselves and not the emotional states they induce.

Following the (un)certainty recall task, participants completed the Affect Misattribution Procedure (AMP), framed as a concentration test. Participants were informed that this was an attention test. After the fixation point disappeared, a "noise word" (a priming word) would briefly flash. Following the "noise word", a Sanskrit pictograph would appear,

Table 1 Priming Words and Targets in the Two Blocks (64 Trials)

Block	Priming Words	Target
Affiliation	affiliate, herding, conformity, crowd, follow, group, along, join	64 Sanskrit pictographs
Isolation	independent, alone, self, loner, individual, single, personal, isolate	64 Sanskrit pictographs

Notes: The presenting order of the trials was random both within and between blocks.

and participants were instructed to do their best to avoid being influenced by the "noise word" and to evaluate the feeling the Sanskrit pictograph evoked on the screen.

The main procedure was adopted from Payne and Lundberg;[41] in each trial of the AMP, participants were first presented with a fixation cross for 500 ms, followed by one of the prime words (representing Affiliation/Isolation) for 100 ms. In this study, the AMP was chosen to compare participants' implicit preferences or aversions toward affiliation or isolation, so each participant was presented with two sets of priming words representing affiliation and isolation separately (see Table 1). After a 100 ms blank screen, a Sanskrit pictograph appeared for 100 ms (examples are shown in Supplementary Figure 1). Prior studies have reported no noticeable difference in valence among these Sanskrit pictographs.[42] A black-and-white pattern mask then replaced the Sanskrit pictograph, and participants were asked to make their responses. Participants' task was to indicate how they considered the Sanskrit pictograph visually pleasant. Participants were asked to press the number keys to report how they thought the Sanskrit pictograph on a 7-point scale that ranges from 1 (very unpleasant) to 7 (very pleasant). The pattern mask remained on the screen until participants gave their responses. The subsequent trial started after an intertrial interval of 500 ms (The procedure is shown in Figure 1).

After participants had completed the AMP, they were asked whether they intentionally rated the prime words instead of the Sanskrit pictograph when they completed the task on a 7-point scale that ranges from 1(not at all, I rated the ideograph) to 7(yes, I rated the words).[43] These procedures ensured that any observed effects genuinely reflected implicit attitudes rather than conscious, controlled responses.

Before the formal trials, all participants engaged in 8 practice trials to reduce any practice effects during the experimental trials. The formal task included eight presentations of the eight prime words, summing up to 64 trials. The computer randomized the order of trials for each participant. Table 1 shows the priming words and the targets in the two blocks. The pilot study evaluated the two priming word sets' representativeness and word frequency (commonness). The results showed no significant differences in representativeness and word frequency between the priming words representing affiliation and isolation, which can be found in Supplementary Table 1.

Results

Demographic Information

All participants are Chinese undergraduate students from a variety of academic disciplines, encompassing majors in the humanities and social sciences (26%), natural sciences (30%), engineering (36%), and the arts (8%). Table 2 presents the other demographic characteristics of the participants in the Self-Uncertainty Group and the Self-Certainty Group. Table 2 shows no significant differences in demographic characteristics between the Self-Uncertainty and Self-Certainty groups, indicating successful randomization.

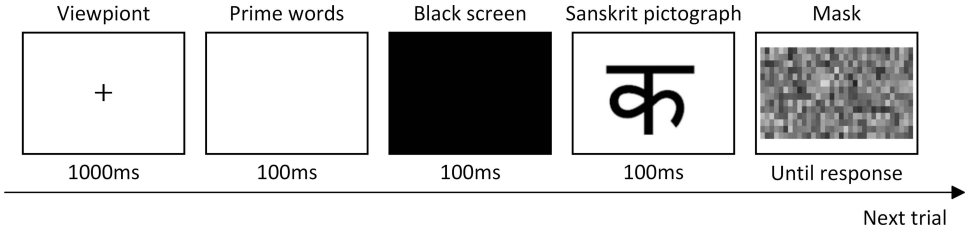

Figure 1 One trial of the Affect Misattribution Procedure (AMP) paradigm. Participants were informed that this was an attention test. After the fixation point disappeared, a "distractor word" (prime word) would briefly flash. Following the distractor word, a Sanskrit pictograph would appear, and participants were instructed to do their best to avoid being influenced by the distractor word and to evaluate the feeling the Sanskrit pictograph evoked on the screen.

Table 2 Demographic Characteristics of Participants by Condition in Study 1

Characteristic	Self-Uncertainty N = 25	Self-Certainty N = 25	t/χ2	P
Age (*Mean* ± *SD*)	19.69(0.98)	19.64(1.08)	0.14	0.89
Gender (Male/Female)	10/15	14/11	1.28	0.40

Manipulation Check

The results of emotions reported after self-uncertainty/certainty was manipulated suggested that no significant difference was found in self-uncertainty ($M_{\text{nervous}} = 2.28$, $SD = 0.81$, $M_{\text{anxiety}} = 1.18$, $SD = 0.39$) and self-certainty ($M_{\text{nervous}} = 1.96$, $SD = 0.71$, $M_{\text{anxiety}} = 1.07$, $SD = 0.27$; t_{nervous} (53) = 1.57, $p = 0.12$, t_{anxiety} (53) = 1.16, $p = 0.25$) conditions. Before conducting the *t*-tests, the data were subjected to a Shapiro–Wilk test to assess normality. The results indicated that the data were approximately normally distributed (*P*s > 0.05 for all conditions), allowing the use of parametric tests. Such findings were consistent with previous research showing that primed self-uncertainty does not alter participants' moods.[37]

To exclude the relation between priming effects in the AMP and self-reported intentionality, we conducted an ANOVA using self-reported intentionality as the dependent variable and the condition and prime type as the independent variables. Before conducting the ANOVA, Shapiro–Wilk tests were performed to confirm that the data did not significantly deviate from normality (*P*s > 0.05 for all conditions). Levene's test for equality of variances indicated that the assumption of homogeneity of variances was met for self-reported intentionality (*P*s > 0.05). We found mean levels of self-reported intentionality did not significantly differ across the two conditions, $F(1, 48) = 1.05$, $p = 0.310$.

AMP Results and Implicit Attitudes

Reaction Times (RTs) less than 300 ms were considered premature responses (0.83% of all responses), and these responses were excluded from the analysis. To test our hypothesis 1, we conducted an analysis of variance using the pleasantness score of the Sanskrit pictograph as the dependent variable and the condition and prime type as the independent variables. Before the ANOVA, Shapiro–Wilk tests were performed to confirm that the pleasantness scores did not significantly deviate from normality (*P*s > 0.05). Levene's test for equality of variances indicated that the assumption of homogeneity of variances was met for the pleasantness scores (*P*s > 0.05). We found a significant interaction between self-uncertain condition and prime type ($F(1, 48) = 12.28$, $p = 0.001$, $\eta^2 = 0.204$).

A simple effects analysis suggests that the participants who were induced self-uncertainty were more likely to judge a pictograph as unpleasant when the pictograph was preceded by isolation prime words (words representing Isolation) ($M = 3.69$, $SD = 0.61$) than when it was preceded by affiliation prime words ($M = 3.99$, $SD = 0.74$), and this difference was highly significant ($F(1, 48) = 16.24$, $p < 0.001$, $\eta^2 = 0.253$). However, for the participants who were induced self-certainty, there was no significant difference between the pleasantness score of the pictograph after the affiliation prime ($M = 3.91$, $SD = 0.73$) and the isolation prime ($M = 3.97$, $SD = 0.82$) ($F(1, 48) = 0.86$, $p = 0.36$). In addition, the pleasantness score of the pictographs presented after the affiliation prime that was rated by the self-uncertainty participants ($M = 3.99$, $SD = 0.74$) was not significantly different from those rated by the self-certainty participants ($M = 3.91$, $SD = 0.73$) ($F(1, 48) = 1.85$, $p = 0.180$) (see Figure 2).

Discussion

Although no significant demographic differences were found between the Self-Uncertainty and Self-Certainty groups, it is essential to consider how demographic factors, such as gender or academic background, might influence responses to self-uncertainty. Previous research has shown that individuals from different disciplines or genders may experience and respond to social isolation or affiliation differently.[44] However, in the current study, demographic variables did not appear to influence the overall findings, suggesting that the effects of self-uncertainty on avoidance-oriented affiliation are so basic that it is consistent across various backgrounds.

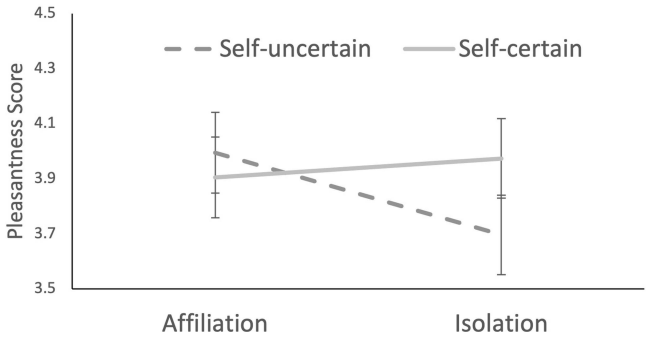

Figure 2 Results of Study 1: The pleasantness scores of the pictographs presented after affiliation/isolation prime words in self-uncertain/certain conditions. Error Bars Represent±1 SEM.

The findings partially confirm our hypothesis that participants experiencing induced self-uncertainty have more negative implicit attitudes towards isolation from a group than participants experiencing induced self-certainty. However, induced self-uncertainty did not result in a more positive implicit attitude towards affiliation with a group, contrasting with our hypothesis that induced self-uncertainty leads to a more positive evaluation of affiliation. This result implies that, in the presence of self-uncertainty, affiliation is more likely to be avoidance-oriented and arises from a desire to avoid social isolation rather than a desire for group acceptance. Previous research has not determined the motivation behind affiliation defense due to their reliance on result-oriented paradigms. For instance, during a threat situation, the level of affiliation with a group was assessed by seeing individuals sitting together in a seating arrangement[23] or showing favoritism towards their in-group.[36]

While the AMP method is highly effective in capturing implicit attitudes, it also has inherent limitations. One notable limitation of using the AMP to assess implicit attitudes is the potential disconnect between implicit attitudes and explicit behaviors or preferences. This disconnect may be due to various factors, including the influence of social desirability, cognitive control, and situational variables that can override or mask implicit tendencies. Therefore, we further explored the explicit attitudes in Study 2.

Study 2

In Study 2, we further infer that the negative implicit attitudes of isolation elicited by self-uncertainty will increase people's tendency to affiliation with a group. In turn, affiliation with a group could make self-uncertain people reduce uncertainty. Study 2 had participants selecting two figures, each comprising a collection of male and female avatars, to represent their preferred group and sense of safety. The figures exhibited variations in avatars' quantity and proximity to one another (refer to Figure 3). Based on our hypothesis, we predict that inducing self-uncertainty will cause participants to prefer being in a larger and more cohesive group (signal affiliation) and feel safer. Conversely, self-uncertain individuals will have less preference for being in a group with fewer avatars placed far apart (signal isolation) and feel less secure in it (H2).

Materials and Methods

Participants

We recruited 70 participants from a university in Beijing in March 2023 and April 2023. The sample consisted of 40 males and 30 females, all Chinese native speakers, who had no prior participation in similar psychological studies within the last half year (M_{age} = 22.63 years, SD = 3.06). Participants were recruited through campus announcements and informed about the study's purpose. Exclusion criteria included a history of severe mental illness, current use of psychoactive medication, and refusal or inability to provide informed consent. Participation was voluntary, and all participants received 30 RMB as compensation for their time. Using G*Power 3.1, we determined that the current sample size was sufficient to obtain adequate power ($1 - \beta > 0.85$) to detect a medium-sized effect ($f = 0.25$).

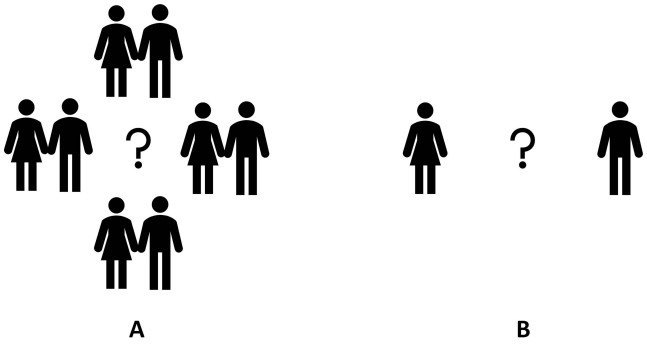

Figure 3 Figures consisting of human avatars (Study 2). The participants were presented with an image depicting a group with eight close, cohesive avatars (signifying affiliation) (**A**) and another image depicting a group with two distant, less cohesive avatars (signifying isolation) (**B**). A question mark was placed in the center of both (**A** and **B**), indicating the position where the participant would be located. For each figure, participants were asked to rate on a 7-point scale, ranging from 1 (not at all) to 7 (very much), how safe they would feel at that specific location.

Procedure and Design

The participants were assigned to a two-factor mixed design of 2 (Condition: Self-uncertainty versus Self-certainty) × 2 (Figure: Affiliation versus Isolation). Condition is the between-subjects factor, and Picture is the within-subjects factor. The dependent variable was the tendency to assign participants to the uncertainty or certainty condition randomly. Upon entering the laboratory, participants completed a booklet with two ostensibly unrelated studies. The self-uncertainty/certainty manipulation replicated the procedure used in Study 1, where participants were primed with self-uncertainty or self-certainty through a writing task designed to recall and describe past experiences of uncertainty or certainty.

Following the manipulation task, participants were introduced to the second study, which was described as an impression-formation task. This task was adapted from Renkema et al and involved presenting participants with images of abstract human avatars symbolizing groups.[20] The photos depicted two different types of groups: one with eight close, cohesive avatars (signifying affiliation) (Figure 3A) and another with two distant, less cohesive avatars (signifying isolation) (Figure 3B). A question mark was placed in the middle of each image, indicating where the participants could hypothetically place themselves within the group. Using abstract avatars allowed us to isolate the effects of perceived group cohesion and size on participants' affiliation tendencies, removing the influence of specific group identities or social contexts. This method directly tests the hypothesis that self-uncertainty leads to a preference for larger, more cohesive groups to avoid isolation and seek safety rather than actively seeking social inclusion for its own sake. For each figure, the participants had to indicate on a 7-point scale, which ranged from 1 (not at all) to 7 (very much), to what extent they wanted to stay in and to what extent they thought they would feel safe in that particular spot.

After completing the experiment, 10 participants were randomly selected and carefully debriefed to assess whether they suspected the study's true purpose or the connection between the two tasks. None of the participants expressed any suspicion regarding the study's purpose or the relationship between the functions.

Results

Demographic Information

All participants are Chinese graduate and undergraduate students from a variety of academic disciplines, encompassing majors in the humanities and social sciences (20%), natural sciences (30%), engineering (44%), and the arts (6%). Table 3 presents the other demographic characteristics of the participants in the Self-Uncertainty Group and the Self-Certainty Group. Table 3 shows no significant differences in demographic characteristics between the Self-Uncertainty and Self-Certainty groups, indicating successful randomization.

Affiliation Tendency

To test our hypothesis, we conducted an analysis of variance with the rating of the tendency to stay in the two figures. Before conducting the ANOVA, Shapiro–Wilk tests were performed to confirm that the tendency scores did not significantly deviate from normality (Ps > 0.05 for all conditions). Levene's test for equality of variances indicated that the assumption of homogeneity of variances was met for the pleasantness scores (Ps > 0.05). The results show that

Table 3 Demographic Characteristics of Participants by Condition in Study 2

Characteristic	Self-Uncertainty *N* = 38	Self-Certainty *N* = 32	*t*/*χ2*	*P*
Age (*Mean* ± *SD*)	22.58(2.59)	22.69(3.58)	0.15	0.07
Gender(Male/Female)	20/18	21/11	1.21	0.33

the interaction between the figure and condition was significant ($F(1, 68) = 17.69$, $p < 0.001$, $\eta^2 = 0.206$). The main effect of the figure is substantial, $F(1, 68)=26.04$, $p < 0.001$, $\eta^2 = 0.277$. In addition, the tests of simple effects indicate that the tendency to isolation was significantly lower in the self-uncertainty condition ($M = 3.58$, $SD = 1.39$) than in the self-certainty condition ($M = 4.03$, $SD = 1.50$) ($F(1, 68) = 47.39$, $p < 0.001$, $\eta^2 = 0.411$). However, the tendency to affiliation in the self-uncertainty condition ($M = 4.55$, $SD = 1.39$) had no difference with the self-certainty condition ($M = 4.12$, $SD = 1.28$), ($F(1, 68) = 0.37$, $p = 0.545$) (see Figure 4).

In addition, we conducted an analysis of variance using the safe feelings as the dependent variable and the condition and figure as the independent variables. Before conducting the ANOVA, Shapiro–Wilk tests were performed to confirm that the tendency scores did not significantly deviate from normality (*P*s > 0.05 for all conditions). Levene's test for equality of variances indicated that the assumption of homogeneity of variances was met for the pleasantness scores (*P*s > 0.05). We found a significant interaction between condition and figure ($F(1, 68) = 24.22$, $p < 0.001$, $\eta^2 = 0.263$). The main effects of condition ($F(1, 68) = 19.12$, $p < 0.001$, $\eta^2 = 0.219$) and figure ($F(1, 68)=22.08$, $p < 0.001$, $\eta^2 = 0.245$) were both significant. The tests of simple effects indicate that the safe feelings when isolation was significantly lower in the self-uncertain condition ($M = 3.50$, $SD = 1.10$) than in the self-certain condition ($M = 4.47$, $SD = 1.59$) ($F(1, 68) = 8.98$, $p = 0.004$, $\eta^2 = 0.117$). However, the safe feelings when affiliation in the self-uncertain condition ($M = 4.50$, $SD = 1.24$) had no difference with the self-certain condition ($M = 4.37$, $SD = 1.28$), ($F(1, 68) = 0.19$, $p = 0.666$) (see Figure 5).

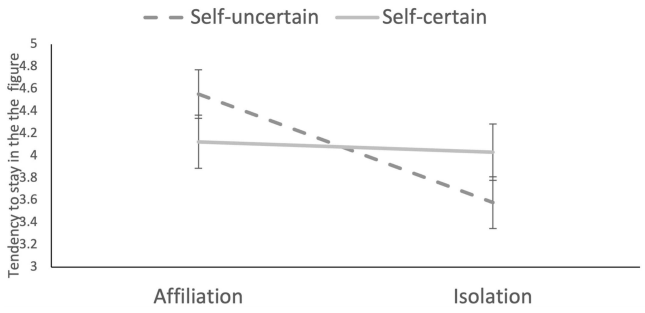

Figure 4 Results of Study 2: The tendency to affiliation and isolation in self-(un)certain condition. Error Bars Represent±1 SEM.

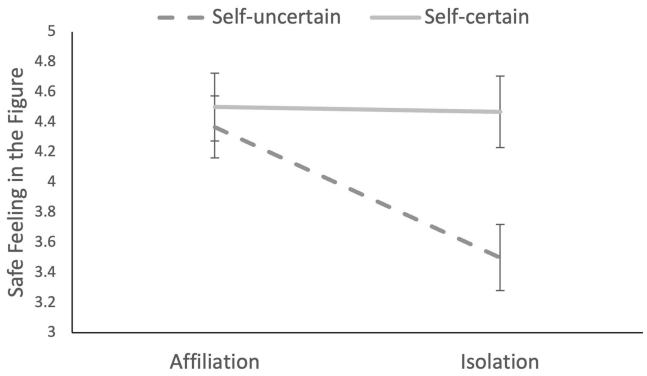

Figure 5 Results of Study 2: The safe feelings when affiliation and isolation in self-(un)certain condition. Error Bars Represent±1 SEM.

Discussion

In line with our expectations, these findings show that in the self-uncertainty condition, the participants showed a significantly lower preference to be located and feel safer in a larger and more cohesive group (affiliation) rather than the "group" of the fewest avatars placed further away from each other (isolation), which would make self-uncertain people have less preference to be located and feel less safe in it. However, in the self-certainty condition, the participants' tendency to affiliation or isolation and their safe feelings when affiliation or isolation have no apparent differences. These findings suggest that self-uncertainty will make people avoid isolation, and being isolated makes self-uncertain people feel unsafe. Combined with the results of Study 1, we further show that self-uncertainty enhances individuals' inclination towards group affiliation, driven by a desire to evade isolation rather than actively seeking membership. These results align with research in psychobiology, suggesting that self-uncertainty can trigger physiological stress responses, resulting in elevated cortisol levels, and cortisol has been linked to implicit avoidance-oriented rather than approach-oriented affiliation arousal.[45,46]

We differentiated between two distinct motives behind affiliation, demonstrating that induced self-uncertainty triggers avoidance-oriented affiliation. However, the "impression-formation task" utilized in Study 2 has limitations, particularly its ability to reflect real-world group affiliation behaviors. Future studies could explore more ecologically valid designs to enhance the generalizability of these findings.

General Discussion

Our study advances the current understanding of self-uncertainty management by demonstrating that, beyond higher cognitive functions, individuals engage in a subconscious, avoidance-oriented affiliation mechanism when faced with self-uncertainty. Unlike prior work emphasizing deliberate identity-driven behaviors,[9,12] our findings reveal a non-cognitive, defensive strategy to escape isolation. In the studies discussed, we proposed that individuals seek refuge in a group while experiencing self-uncertainty to escape isolation, even if the group lacks any specific identity and entitativity.

Two studies' findings corroborate this notion. In Study 1, we initially utilized the AMP to measure the subconscious activation of the implicit motive for affiliation following self-uncertainty induction. Participants who experienced self-uncertainty showed more negative implicit attitudes towards isolation from a group than those who experienced self-certainty. However, self-uncertainty did not lead to a more positive implicit attitude towards group affiliation. In Study 2, we investigated the hypothesis that a negative implicit attitude can lead individuals to avoid isolation and seek affiliation. As anticipated, Study 2 demonstrated that individuals with self-uncertainty had a notable inclination to stay and feel safer in a larger and more cohesive group (affiliation) rather than in the group with the fewest avatars located farthest apart (isolation).

These results indicate that affiliation is a fundamental defense mechanism against self-uncertainty by preventing isolation, making it avoidance-oriented. Our findings expand the understanding of self-uncertainty management by revealing that the motivation to avoid isolation can operate even without a strong group identity or entitativity. This contributes to a growing body of literature that explores non-cognitive mechanisms in social behavior and challenges the traditional emphasis on cognitive processes in group affiliation.

Although this study does not explore why self-uncertainty causes individuals to unconsciously and automatically avoid isolation, we make assumptions based on existing research. Self-uncertainty fundamentally threatens essential aspects of the self—one's perceptions, attitudes, values, and goals, and causes insecurity about the behaviors and decisions made by the self.[9] For individuals with self-uncertainty, being isolated or expelled from the group is challenging from an evolutionary standpoint.[17,18] So isolation may be taken as a threat signal in situations of self-uncertainty. The general model of threat and defense[1] suggests that individuals respond with immediate responses such as heightened alertness and avoiding the threat when faced with danger. Further investigation is required to explore this defense process in future research.

The results challenge the traditional emphasis on cognitive processes behind group affiliation and call for a broader understanding of the motivations behind group affiliation. Conventional models of group affiliation, such as Social Identity Theory[47] and Terror Management Theory,[3] emphasize the cognitive processes involved in affiliating with a group for self-identity enhancement; our study introduces a complementary, subconscious mechanism—where

affiliation serves as a defense against social isolation and uncertainty. This non-cognitive process, driven by an instinct for safety, challenges the assumption that all group affiliations stem from a need for positive social identity.[48]

Our findings extend beyond traditional cognitive processes by introducing a more fundamental, non-cognitive mechanism driving group affiliation. This mechanism is primarily motivated by an essential safety need rather than identity validation. Specifically, we propose that individuals may seek physical proximity to groups as a basic safety-seeking behavior when faced with self-uncertainty. This form of affiliation does not necessarily involve a strong identification with the group's values or beliefs. Instead, it serves to mitigate the psychological discomfort associated with feelings of isolation and vulnerability.

This finding aligns with research in evolutionary psychology, which suggests that the need for safety and security can drive individuals to seek out others even without a strong group identity.[15] Consistent with this, some psychobiological work suggests that affiliation can reduce self-uncertainty through neuroendocrine processes.[7] Affiliation defenses are thus qualitatively different from rational and symbolic defenses, which are forms of defense that rely mainly on subconscious, fundamental defense systems that operate in humans and other animal species. As such, the results suggest a previously unrecognized role for the group in coping with uncertainty: the anxiety-buffering role of affiliation may operate, to a large extent, through sub-cognitive mechanisms that are independent of socially shared symbolic meanings.

Conversely, unlike traditional theories, which often emphasize the pursuit of positive social identities, our findings reveal a fundamental defensive strategy where the primary goal is to avoid negative experiences. This distinction enriches the theoretical landscape of social psychology by contrasting with the prevailing emphasis on positive identity outcomes as the primary driver of group affiliation. While existing literature focuses heavily on approach-oriented motives, our research introduces a complementary perspective highlighting avoidance-oriented affiliation as a fundamentally defensive strategy. It suggests that in some contexts, the primary motive for seeking group affiliation may be more about avoiding negative experiences, such as isolation and anxiety, rather than achieving positive social identity benefits.[3]

The distinction between these two forms of affiliation highlights the multifaceted nature of human social behavior and suggests that the mechanisms underlying group membership are more complex than previously understood. While approach-oriented affiliation emphasizes active engagement and the pursuit of social rewards, avoidance-oriented affiliation underscores a more fundamental, defensive strategy to mitigate potential social and psychological threats. This dual perspective expands our understanding of group dynamics and challenges existing psychological models that predominantly focus on the positive aspects of group membership.

Moreover, our findings suggest that non-cognitive factors, such as the innate need for safety and security, play a crucial role in driving individuals toward groups. Understanding avoidance-oriented affiliation has practical implications for therapeutic and organizational interventions. For example, in clinical settings, therapists could leverage group-based therapy to provide support and tap into the automatic need for safety that our findings reveal. In organizational contexts, leaders could structure teams to foster a sense of group safety during periods of change, where uncertainty is high, by promoting inclusive, cohesive group environments to reduce feelings of isolation and anxiety. Given that avoidance-oriented affiliation can help mitigate feelings of self-uncertainty and prevent isolation, interventions that foster social connectedness may be effective in reducing risks associated with isolation, such as depression and anxiety. These results highlight the importance of creating inclusive environments, particularly in educational and organizational settings, where individuals can find group support to buffer the effects of self-insecurity.

Before concluding, we will outline the present study's limitations and future research challenges. First, the relatively small and homogeneous sample, consisting of undergraduate students, may limit the generalizability of the results to broader populations. Future research should consider replicating these findings with more diverse samples and using longitudinal designs to examine how avoidance-oriented affiliation may evolve—exploring the role of different cultural contexts, stress levels, or social environments in shaping avoidance-oriented affiliation. In the current research, uncertainty is the inability to judge the impact of unpredictable societal or personal events. Future studies should continue examining the described outcomes' applicability using additional uncertainty manipulation. Provide valuable insights into the universality of this mechanism. Addressing these limitations would strengthen the empirical basis of this research and offer deeper insights into the psychological mechanisms underpinning avoidance-oriented affiliation. Finally, while

ANOVA was employed as a suitable statistical method, alternative analytical approaches, such as multilevel modeling, may capture more complex data structures.

Conclusions

Uncertainty is an inevitable aspect of human existence. Various data indicate that individuals cope with self-uncertainty by adhering to a shared social identity that dictates and collectively approves how one should think, feel, and behave. Our study demonstrates that individuals engage in group affiliation, not for social identity validation but as an automatic and subconscious defense mechanism to avoid the discomfort of isolation. The discovery of this avoidance-oriented affiliation expands our understanding of group dynamics by shifting focus from identity-driven behaviors to primary defensive responses. Moreover, understanding avoidance-oriented affiliation offers practical applications for interventions addressing social isolation and anxiety in therapeutic environments or during organizational transitions. For instance, this finding can be used to design support structures in work or educational contexts that foster group cohesion as a buffer against stress or uncertainty. While our study demonstrates the subconscious mechanism of avoidance-oriented affiliation, further research could explore how avoidance-oriented affiliation works in various contexts, such as work environments or social stress. It could also involve longitudinal studies to assess its persistence over time. Additionally, these findings should be replicated across more extensive and diverse samples. Alternative methods, such as multilevel modeling, could be employed to handle the complexity of the data.

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Author Contributions

All authors made a significant contribution to the work: Yang Gao was responsible for study design, data analysis, manuscript writing, and revisions; Weijia Peng made significant contributions to the modification and language polishing of the manuscript; Xinjia Xi and Yaqing Gan managed the execution of the experiment and data collection; Yang Shen contributed to the study design and oversaw the management and coordination of the research process. All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Disclosure

The authors report no conflicts of interest in this work.

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