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**Beyond First Impressions: Understanding the Relationship between Cognitive Load, Cognitive Reflection and False Consensus Effect**

IN6208 Research Methods & Data Analysis

for Information Professionals

Research Report

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**Abstract**

This study investigates the relationship between cognitive load and the false consensus effect (FCE), examining how cognitive reflection moderates this relationship. While previous research has established that cognitive load influences various cognitive biases, its impact on FCE remains unexplored. In today’s information-rich environment, where cognitive demands are increasingly high, this research is relevant in helping individuals recognize how cognitive load may influence their judgments about the extent of agreement with others. Using a sample of 18 graduate students from NTU, this study measures cognitive load through self-reported assessments, FCE through the discrepancy between estimated and actual consensus, and cognitive reflection using the Cognitive Reflection Test (CRT). While results did not reveal a significant relationship among cognitive load, FCE, and cognitive reflection due to sample limitations, this study expands the scope of FCE research and highlights the challenges inherent in examining this bias. Additionally, observed differences in FCE between majority and minority groups suggest promising avenues for future research.

**Introduction**

Tversky and Kahneman (1974) first proposed the concept of cognitive load in their publication "Judgment under Uncertainty: Heuristics and Biases." They demonstrated how humans typically use a small set of heuristic concepts to compress difficult jobs into more manageable judgment operations when determining the likelihood of uncertain events or the value of unknown quantities. The representativeness heuristic, availability heuristic, and anchoring and adjustment heuristic are the three main cognitive heuristics that they methodically introduced. They also discussed how these heuristics contribute to systemic biases in decision-making.

One of the systemic biases that individuals often experience, influenced by these cognitive heuristics, is the false consensus effect (FCE). When Ross (1977) originally investigated FCE, he discovered that "social observers tend to perceive a 'false consensus' regarding the relative commonness of their own responses." Later studies have indicated a connection between the availability heuristic and FCE, even though Lee did not explicitly mention it in his study. Notably, Marks and Miller (1987) concluded that four theoretical perspectives—selective exposure and cognitive availability, salience and attentional focus, logical information processing, and motivational processes—can be used to analyze a large portion of the research on FCE and related biases in social perception (such as assumed similarity and overestimation of consensus). They admitted that these viewpoints might not operate separately but rather overlap, indicating that cognitive availability—which is strongly linked to the availability heuristic—may be a component in the false-consensus bias. For this reason, FCE is frequently thought of as an example of cognitive bias.

Salience and attentional focus, on the other hand, show that people have limited attentional resources and can usually only focus on the most salient information when their cognitive load is high. Because of this restriction, people may become swayed by their own opinions and overestimate the possibility that others share them.

Paas and Van Merriënboer (1994) went on to discuss cognitive load as "a multidimensional construct that represents the load that performing a particular task imposes on the cognitive system of a learner." According to Chandler and Sweller (1991), cognitive load can take the form of "the complexity of the knowledge being acquired" or "the manner in which information is presented." Numerous social biases, such as the central tendency bias (Allred et al., 2016) and the social desirability bias (Stodel, 2015), have been shown to be impacted by cognitive load.

Studies specifically looking at the connection between cognitive load and FCE, however, seem to be lacking. People usually suffer from increased cognitive load in today's fast-paced, information-rich environment. Continuous decision-making and prioritization are required due to the tremendous demands placed on cognitive resources by the quick development of technology and the steady stream of information from news sources, social media, and digital communication. Reduced cognitive efficiency and mental exhaustion may result from the abundance of information available.

Frederick (2005) defined "cognitive reflection" as "the ability or disposition to resist reporting the response that first comes to mind." As a framework for cognitive reflection, he also suggested "The Cognitive Reflection Test (CRT)" to evaluate an individual's capacity to think more deeply and control automatic responses when confronted with options and difficulties. By analyzing CRT scores, researchers can examine reflective ability in cognitive decision-making and its relationship to choice biases. Given that FCE primarily involves heuristic thinking, and that cognitive reflection reflects an individual's inclination to use either intuitive responses or deeper reasoning, cognitive reflection may play a role in the relationship between cognitive load and FCE.

Therefore, this paper's goal is to examine how cognitive load affects the level of FCE and whether individual differences in cognitive reflection moderate this relationship.

FCE has a substantial impact on how people project their preferences and beliefs onto other people, which affects communication, perceptions, and decision-making in a variety of domains. For instance, political elites frequently display egocentric biases, whereby their assessments of public opinion reflect their own opinions rather than those of the broader public, according to Broockman and Skovron (2023). Because leaders may exaggerate the degree to which voters share their political preferences, these biases can result in poor policy judgments. Similar to this, marketing experts frequently project their preferences onto consumers, which results in erroneous market assessments and unsuccessful strategies, according to Meyer and Markman (2022). According to Prelec and Bodapati (2020), people usually exaggerate how popular celebrities they admire are, which affects voting patterns, fan interaction, and marketing tactics used by the entertainment sector. These past studies highlight the FCE’s pervasive influence on judgment accuracy across a range of domains, influencing interactions and interpersonal impressions. Consequently, studying how cognitive load affects the level of FCE is crucial, especially in the fast-paced, information-rich world of today.

**Literature Review**

*Cognitive Load*

Past research has demonstrated that cognitive load influences various cognitive biases, but its effects are not uniform. For instance, Allred et al. (2016) found that increased cognitive load heightens the central tendency bias, where individuals’ judgments tend to gravitate toward the average of available options. In contrast, Stodel (2015) concluded that cognitive load reduces the influence of social desirability bias, as the added mental strain makes it more difficult for individuals to present themselves in a socially favorable manner. Despite these findings, there is little research specifically addressing the impact of cognitive load on the false consensus effect (FCE). This gap in the literature leaves the cognitive mechanisms underlying agreement-based biases, such as FCE, largely unexplored.

*False Consensus Effect (FCE)*

Past research on the FCE mainly focuses on four main areas: the nature of false consensus, influencing factors, mitigation strategies, and specific scenarios where FCE is observed.

First, regarding the nature of false consensus, Ross et al. (1977) demonstrated that FCE has been observed in both hypothetical situations and real conflict scenarios, indicating the widespread impact on social perception and inference processes. While the illusion of consensus is widespread, Desai et al. (2022) shows that individuals do have the capacity to differentiate between true and false consensus.

Second, several influencing factors affecting the magnitude of FCE were discovered and discussed. Squillante & Ventre (2010) shows that the description of the choice option and the form of the judgment task have an impact on the magnitude of the agreement in the case of the presence of the FCE. Coleman (2018) investigated the impact of emotions on the FCE by manipulating emotions into three states: happiness, neutrality, and sadness through an emotion induction method. Additionally, Bunker & Varnum (2021) found that heavier use of social media was associated with stronger FCE.

Third, research has also explored factors that moderate the relationship between independent variables and FCE, offering insights into how to mitigate this effect. Wojcieszak & Price (2009) found that encountering disagreement can attenuate the association between individual opinions and FCE. Selart et al. (2020) studied FCE in management and found that team mindfulness, when combined with team processes such as open-mindedness, participation, empowerment, conflict management, and value and ambiguity tolerance, can help reduce false consensus, although team mindfulness alone may not guarantee effective decision-making.

Lastly, FCE has been observed in several specific scenarios. Collisson et al. (2021) found that when estimating celebrity popularity, people tend to overestimate the popularity of celebrities they favor. In marketing, Herzog et al. (2022) discovered that professionals often project their preferences onto customers, but this tendency can be reduced by advising them to suppress personal biases, particularly when preferences are certain. Matsuo et al. (2023) conducted studies in Japan that indicate the existence of false consensus in the ranking of moral foundations, with participants estimating others' values similarly to their own.

However, the role of cognitive load has not been fully explored, and we believe it is an important factor with potential impact on FCE.

*Cognitive Reflection*

Frederick (2005) defines the Cognitive Reflection Test (CRT) as a kind of measurement of cognitive reflection, which is "the ability or disposition to resist reporting the response that first comes to mind". Toplak et al. (2011) showed that "the CRT is a more potent predictor of performance on a wide sample of tasks from the heuristics-and-biases literature than measures of cognitive ability, thinking dispositions, and executive functioning." In summary, cognitive reflection captures the peoples' ability to override intuitive responses, and CRT test is prevalently used in cognitive reflection related research.

Baldi et al. (2013) showed that "cognitive reflection is associated with a reduction of decision-making bias associated with social status". Coutinho et al. (2021) studied the role of cognitive reflection in the Dunning-Kruger effect. Participants with low cognitive reflection ability are most likely to overestimate their performance, while participants with high cognitive reflection ability tend to slightly underestimate their performance. Ferreira et al. (2023) proposed that people often exhibit the base rate fallacy in judgment tasks by relying on stereotypes and ignoring prior probabilities, whereas those with higher cognitive reflection ability are better at avoiding this fallacy, showing smaller deviations and being closer to the Bayesian solution. However, no studies have looked at the relationship between cognitive reflection, cognitive load and FCE, which provides a unique perspective for our study to explore this potential relationship.

**Research Goal**

*Research Objective*

The objective of this study is to examine the relationship between cognitive load and false consensus effect, and how individuals' cognitive reflection may moderate this relationship.

*Hypotheses*

Herlan, Triana, and Suhardi (2020) suggest that under conditions of high cognitive load, individuals are more prone to making heuristic judgments, using mental shortcuts rather than engaging in more deliberate, analytical thinking. This reliance on heuristics can increase judgment errors, particularly in situations where individuals need to estimate others’ preferences or beliefs. Dale (2015) further argues that "relying on existing heuristics can make it difficult to see alternative solutions," which means that individuals under cognitive strain are more likely to stick with their initial assumptions and overestimate how much others agree with them. In the context of FCE, this could manifest as individuals projecting their own opinions onto others without considering diverse viewpoints, especially when cognitive load limits their ability to process information thoroughly. Consequently, we hypothesize that higher cognitive load will exacerbate FCE, as individuals fall back on their own perspectives to simplify decision-making under pressure.

**H1**: There exists a positive relationship between the level of cognitive load and individuals' false consensus effect.

As proposed by Frederick (2005), people with high cognitive reflection, have better abilities to resist intuitive responses. According to Jalbert & Pillai (2024), people with higher CRT scores (which reflects higher cognitive reflection) may be better able to use their cognitive resources to mitigate the effects of fluency when making judgments about consensus. Fluency here refers to the familiarity and efficiency of information processing. When people are faced with new information, their fluency is low and they usually need to spend more energy to process it; but after repeated encounters with the information, fluency becomes high, and people may intuitively use the previous processing methods of the information, thereby reducing thinking about the information and falling into heuristic thinking. Therefore, people with high cognitive reflection may be less likely to rely on heuristic shortcuts even under high cognitive load, which may reduce their likelihood of overestimating consensus, better resist bias, and reduce the strength of the false consensus effect. Therefore, we speculate that cognitive reflection (indicated by CRT scores) can moderate the impact of cognitive load on the false consensus effect.

**H2**: Individuals' cognitive reflection moderates the relationship between cognitive load and false consensus effect.

**Methodology**

*Operationalization of constructs*

The key constructs examined in this research—cognitive load, false consensus effect (FCE), and cognitive reflection—are operationalized based on established frameworks from past literature to ensure consistency and reliability. Firstly, in this study, cognitive load is operationalized based on the complexity of question descriptions, following the framework proposed by Chandler and Sweller (1991). As mentioned previously, cognitive load refers to the mental effort required to process information, and it can be influenced by factors such as the difficulty of the task and the clarity of the instructions. To capture this, respondents will first be provided with a clear definition of cognitive load, ensuring they understand its meaning in the context of this research. After completing each question, they will be asked to reflect on their cognitive experience and rate the level of cognitive load they encountered. This self-reported rating reflects the respondents' own assessment of the mental effort involved, allowing us to measure cognitive load based on their subjective experience rather than the presumed level of difficulty set by the research designers.

Secondly, FCE is measured by the discrepancy between respondents’ estimates of how many others share their opinion and the actual consensus. This method has been widely used in prior research, including studies by Ross, Greene, and House (1977), Kim and Sundar (2020), and Niiya and Kurisu (2020). To calculate FCE of each respondent, the following formula will be used:

FCE = (estimated percentage of people with same choice − actual percentage of people with same choice).

Lastly, the cognitive reflection will be measured using the Cognitive Reflection Test (CRT). CRT specifically measures an individual's ability to hold back instinctive, immediate responses, which can reveal their level of cognitive reflection (Frederick, 2005). CRT contains three questions, initially developed by Frederick (2005). Each question presents an intuitive yet misleading response, which participants must reflect on to recognize as incorrect. Despite the simplicity of the required mathematical operations, many individuals perform poorly on the CRT (Sirota et al., 2015). However, given that our respondents are graduate students from science and technology backgrounds, we will classify participants who score full marks as having high cognitive reflection, while those who answer at least one question incorrectly will be considered to exhibit a low cognitive reflection. Table 1 lists the 3 CRT questions introduced by Frederick (2005), with their misleading response and correct answers.

Table 1. CRT questions and answers

|  |  |  |
| --- | --- | --- |
| **CRT Question** | **Intuitive answer** | **Correct answer** |
| “A bat and a ball cost $1.10 in total. The bat costs $1.00 more than the ball. How much does the ball cost? \_\_\_\_\_ cents.” | 10 cents | 5 cents |
| “If it takes 5 machines 5 min to make 5 widgets, how long would it take 100 machines to make 100 widgets? \_\_\_\_\_ min.” | 100 min | 5 min |
| “In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake?” | 24 days | 47 days |

*Data Collection*

In the data collection phase, we designed the survey questions and established sampling criteria to reduce bias and strengthen the reliability of FCE measurement. Questions were chosen based on having a low actual consensus, since FCE is diminished when actual consensus of the question is high (Kałużna-Wielobób & Mudyń, 2017).​ A pilot study was conducted to assess whether the questions varied in their perceived cognitive load from respondents’ perspectives and to capture the level of actual consensus to avoid high actual consensus questions.

To mitigate potential biases from convenience sampling, we reviewed past research to understand the influence of common demographic factors on FCE. According to Kałużna-Wielobób and Mudyń (2017), gender does not significantly impact FCE levels. While their research suggests that FCE tends to weaken with age, this factor is unlikely to be relevant for our study, as our sample population is relatively homogeneous in terms of age. Therefore, we do not expect age to have a significant effect on our findings.

In this study, 22 graduate students from NTU were invited to participate, and we received 18 responses. Respondents were randomly assigned into two groups, and each group answered one version of the survey. As studies by Marks and Miller (1987), Ross et al. (1977), and Krueger and Clement (1994) have demonstrated that university students tend to overestimate the degree to which others share their opinions, the existence of FCE among our respondents is supported.

*Survey Design & Pilot Study*

To reduce potential biases and enhance the robustness of our findings, we included 3 question types that contains various decision-making contexts. These contexts include (1) extreme scenarios, which may be rare or hypothetical and provoke respondents to confront unusual outcomes, (2) realistic risk-based scenarios that are closer to everyday situations, requiring respondents to weigh costs and benefits in a manner familiar to their daily lives, and (3) neutral scenarios that lack explicit loss or gain, promoting balanced responses without overt emotional or cognitive triggers. By including this mix, we aim to reduce biases arising from personal inclinations or familiarity with specific decision types and have a broader assessment of cognitive load and FCE across varied contexts. In the survey, each respondent answered all 6 questions, and the question version will depend on their grouping. There are 2 versions of the survey, and questions in presumed high cognitive load version in survey version A are in presumed low cognitive load version in survey version B and vice versa. In addition, counterbalancing is applied by randomizing the question orders to control potential sequencing effects on participants cognitive load level.

Table 2. Example of original and revised version of a question

|  |  |  |  |
| --- | --- | --- | --- |
| **Original Question** | **Average Perceived Cognitive Load** | **Revised Question** | **Average Perceived Cognitive Load** |
| High cognitive load version: Suppose there is a button. If you choose to press it, you will change the fate of the entire human race forever in an unspeakable and extraordinary way under unexpected conditions: you will save everyone from a disaster that threatens the entire civilization. However, the moment you press the button, as a price, you will be completely erased from everyone's memory and historical traces, whether it is photos, records or memories, everything about you will be eliminated, and your relatives, friends and anyone who knows you will lose all knowledge of you, as if you have never set foot in this world. Will you choose to press this button? | 4 out of 7 | High cognitive load version: Envision yourself encountering an abstruse apparatus, a button ensconced within the confines of a fortified facility, laden with existential gravity that reverberates across the fabric of global continuity. The actuation of this enigmatic device harbors the potential to avert an imminent cataclysm threatening humanity’s very existence. However, the repercussions of your decision extend far beyond mere temporal implications, as the engagement with this device would result in the irrevocable dissolution of all vestiges of your existence—every fragment of your identity, from visual documentation to mnemonic remnants and historical chronicles tethered to your being, would be expunged entirely. Moreover, individuals with emotional affiliations to your essence may undergo a profound, ineffable sense of loss, perceiving your absence in an inexplicable manner that transcends conventional recollection. Confronted with these multifaceted ramifications and the intricate interplay of potential outcomes, would you still exercise the volition to engage the button, fully cognizant of the duality inherent in its consequences and the comprehensive obliteration of your identity from the annals of reality? | 6.1 out of 7 |
| Low cognitive load version: Suppose there is a button, if you press the button, you will save the world, but you will vanish from everyone's memory. Will you press the button? | 3.7 out of 7 | Low cognitive load version: Suppose there is a button, if you press the button, you will save the world, but you will vanish from everyone's memory. Will you press the button? | 3.4 out of 7 |

A pilot study was conducted using convenience sampling, with 7 responses for version B and 8 responses for version A. All participants were graduate students from similar academic backgrounds. The primary goal of the pilot study was to assess whether the questions varied in their perceived cognitive load from the respondents' perspectives. Participants were presented with questions in both high and low levels of cognitive load in random order. Their feedback allowed us to understand whether the intended complexity of the questions was effectively perceived. Additionally, the pilot study aimed to capture the level of actual consensus, meaning how much respondents agreed on their answers. By doing so, we could identify questions where the consensus was unexpectedly high, as this could undermine the investigation of the false consensus effect. Based on the pilot study results, we updated questions that either failed to show clear distinctions in cognitive load or had a high actual consensus. Table 2, for example, illustrates a question that initially failed to demonstrate significant differences in perceived cognitive load. To address this, we modified the high cognitive load version by increasing vocabulary complexity and lowering readability, aiming to raise the cognitive demands of the question with higher complexity in question description. This iterative process was crucial in refining the survey design, ensuring that the final set of questions would more accurately capture the relationship between cognitive load and FCE.

*Data Analysis Approach*

In this study, we employed Pearson’s correlation coefficient to assess the relationship between perceived cognitive load and respondents’ levels of FCE, which helped us to evaluate the strength and direction of any potential correlation. Additionally, an independent t-test was conducted to determine whether there is a statistically significant difference in the cognitive load-FCE relationship between individuals with high and low levels of cognitive reflection. This analysis allowed us to assess whether cognitive reflection moderates the relationship between cognitive load and FCE, thereby providing insights into individual differences in susceptibility to FCE under varying cognitive demands.

**Findings and Discussions**

According to our results, even in situations with a high cognitive load, individuals' False-Consensus Effect (FCE) was mild and showed little fluctuation. Both overestimation and underestimating of agreement are revealed by the FCE value distribution; however, FCE values were often low among our respondents (range: -0.06481 ~ 0.355556), with some negative values suggesting underestimation instead of expected overestimation. The low mean FCE 0.126132 in this case indicates that participants did not, on average, firmly assume that others would hold similar opinions.

Due to the low level of FCE among our respondents, the relationship between cognitive load and FCE is also hard to observe. Our research discovered generally weak connections between cognitive load and FCE in the correlation analysis between cognitive load and FCE. Most correlations are either faintly positive or negative, with only one question showing the greatest correlation (0.369), indicating a minor positive association. Across the entire dataset, none of these associations are significant enough to draw conclusions about the link between cognitive load and FCE.

Table 3: t-Test on FCE between Individuals with Low and High Cognitive Reflection

|  |  |  |
| --- | --- | --- |
|  | Low Cognitive Reflection | High Cognitive Reflection |
| Mean | 0.099735 | 0.073064 |
| Variance | 0.022686 | 0.010558 |
| Observations | 7 | 11 |
| Hypothesized Mean Difference | 0 |  |
| df | 10 |  |
| P(T<=t) one-tail | 0.41152 |  |
| t Critical one-tail | 0.344686 |  |
| P(T<=t) two-tail | 1.812461 |  |
| t Critical two-tail | 0.689373 |  |

Additionally, the FCE ratings of those with high and low cognitive reflection were compared using the t-test. In terms of mean FCE, there appears to be a little difference between high cognitive reflection individuals and low cognitive reflection individuals, with the former having a slightly higher average FCE score (0.0997), as shown in Tab. 3. At standard significance levels, such as 0.05, the t-statistic (0.4115) and p-values (one-tail = 0.3447, two-tail = 0.6894), however, show no statistically significant difference between the two groups. This suggests that cognitive reflection level has no discernible effect on FCE scores based on our survey results available.

The absence of substantial statistical significance across tests suggests that any association between cognitive load, cognitive reflection level, and the FCE may be modest or context-dependent, despite the fact that some trends are discernible. These correlations may become clearer with additional research using better controls and a larger sample size. The following are some potential explanations for these results:

1. Past knowledge & positive self-representation

In this research, our respondents had already encountered the research topic of FCE. The idea of FCE was explained in our proposal presentation, along with its workings and common applications. Participants' answers might have been unintentionally impacted by this prior knowledge because they were probably more conscious of the possible biases being examined. Moreover, with the knowledge about FCE, respondents may try to present themselves positively by not overestimating the agreement. Therefore, the manifestation of FCE in the survey findings may have been weakened as a result of individuals purposefully or unconsciously modifying their answers to avoid succumbing to prevalent cognitive biases.

1. Limited Sample Size

With only 18 participants, the study's sample size was very limited to detect statistically significant effects. The study's power is limited by the small sample size, which makes it challenging to extrapolate results or identify minute variations across circumstances with low and high cognitive load. We may anticipate more significant results and perhaps a better manifestation of the FCE with a larger and more varied sample.

1. Cultural Context

The majority of FCE research has been done in Western nations, where cultural norms might be very different from those in East Asia, including Singapore. Heine (1997) stated that "Research in cultural psychology has underscored the notion that many psychological processes are not universal, and that culture plays an important role in influencing the ways that people think about, feel about, and view themselves." According to the results of some cognitive bias tests, groups with members from different cultures differ greatly. For instance, Markus and Kitayama (1991A) discovered that although North Americans have continuously shown this effect (e.g., Campbell, 1986; Marks, 1984), Japanese do not exhibit a false-uniqueness bias (i.e., the tendency to see oneself as uniquely talented or better than most people on a given dimension). Furthermore, a study of Chinese students in Singapore by Hewstone and Ward (1985) found no evidence of group-serving biases at all, whereas Bond et al. (1985) found that American students showed a more pronounced group-serving bias for sex-typed activities than dis Chinese students. Different views on individuality (Western) and collectivism (Eastern) may result in varying degrees of the false-consensus bias test result, even though no evidence directly indicates that East Asian societies frequently exhibit lower levels of FCE compared to their Western counterparts. People may be less inclined to assume consensus in East Asian environments because they are more prone to suppose that others have different opinions. It's possible that cultural norms contributed to the poor FCE seen here, but more research on the impact of culture on FCE could help elucidate this effect.

Table 4. t-Test on Mean FCE between Minority and Majority Group

|  |  |  |
| --- | --- | --- |
|  | Minority | Majority |
| Mean FCE | 0.294745977 | 0.008767899 |
| Hypothesized Mean Difference | 0 |  |
| t Stat | 2.354217676 |  |
| P(T<=t) one-tail | 0.039077268 |  |

Although both our hypotheses are not supported, our study highlights a finding that could serve as valuable directions for future research. A paired two sample t-test was performed on two groups of data on FCE. Although there is no extremely high actual consensus for the survey questions, some questions have around 60-40 distribution of respondents choosing each choice. The “Minority” group refers to respondents who chose the less popular choice, and the “Majority” group refers to those who made the same choice with the majority. As shown in Tab. 4, the mean FCE of the “Minority” group is 0.2947, which is higher than 0.0088 of the “Majority” group. The p value of this t-test is 0.0391, which is less than 0.05, indicating that there is a significant difference between the two groups. The result revealed that participants who made choices aligned with the majority had lower FCE scores, whereas those who chose differently from the majority had higher FCE scores. Similar to what we find in our study, Dixon et al. (2024) found that minority Republicans who oppose climate action are more prone to incorrectly perceive their views as shared by other majority Republicans. The result of this research highlights the role of information environments in shaping individuals' willingness to express their beliefs and their perception of other people's opinions, which in turn may contribute to the FCE. However, it is important to note that Dixon et al. (2024) focuses on group-level false consensus, whereas our study examines false consensus at the individual level. False consensus may operate differently depending on the social context.

Besides, there are several limitations that should be acknowledged. One major limitation is the small sample size, which only consisted of 18 NTU graduate students. Additionally, all participants were from the same class with similar backgrounds. The range of participants limits the generalizability of our findings to broader populations with diverse educational and cultural backgrounds. Future studies should consider including a larger and more diverse participant pool to enhance the generalizability of the results. Another significant limitation is that participants were informed about FCE before completing the questionnaire. This prior knowledge may have influenced their responses, reducing the likelihood of displaying the bias, and thereby preventing us from finding a significant relationship between cognitive load and FCE or identifying a moderating effect of cognitive reflection.

**Conclusion**

This study aimed to investigate the relationship between cognitive load and the false consensus effect (FCE), and to explore how individuals' cognitive reflection moderates this relationship. However, a low level of FCE was observed in the study. As a result, despite our initial hypotheses, the results did not support a significant positive relationship between cognitive load and FCE, nor did cognitive reflection moderate this relationship. These outcomes may be influenced by the small sample size, participants' background and their prior knowledge of FCE. All these limitations likely prevented the demonstration of the effect. Therefore, it is necessary to conduct the experiment with a larger and more diverse participant pool to further verify and validate the hypotheses in future studies.

Despite the failure to confirm our hypotheses, an additional finding emerged: individuals with minority views exhibited higher levels of FCE. This aligns with previous research indicating that individuals in minority positions often overestimate the prevalence of their beliefs. Since our research focuses on individual-level FCE, future studies could investigate the influence of cognitive load and cognitive reflection on FCE in a group setting to determine whether social context leads to different results. Additionally, examining how individual-level FCE affects collective decision-making would provide a deeper understanding of its impact in different social contexts.

In conclusion, although the expected relationships were not found, the study highlights the importance of examining cognitive load and cognitive reflection in the context of false consensus judgment biases. It not only contributes to expanding the scope of FCE research, but also raises awareness of the limitations and complexities involved in studying FCE. Moreover, our findings suggest potential directions for future research based on the additional finding, with which the theoretical and practical boundaries of the paper can be extended into a broader social context.

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