Relationship Between Cognitive Biases and Reading Comprehension among College Students

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ABSTRACT

With reading comprehension skills continuing to decline globally and locally, understanding the cognitive factors that are associated with it has become increasingly important. This study explored the relationship between cognitive biases and reading comprehension among 62 second-year Bachelor of Secondary Education students at Partido State University-College of Education. Using a descriptive-correlational design, the research aimed to describe the relationship between students' susceptibility to six cognitive biases—anchoring bias, confirmation bias, cognitive overload bias, the Dunning-Kruger effect, the illusion of truth effect, and the recency effect—and their reading comprehension levels. Data were collected through an expert-validated 5-point Likert scale questionnaire and secondary data from the university's Reading Center. Statistical analysis revealed that while students demonstrated varying levels of susceptibility to specific cognitive biases, no statistically significant relationship was found between these biases and their reading comprehension levels. These findings suggest that while cognitive biases may influence how students engage with texts, they do not directly predict reading comprehension performance in this sample. The study underscores reading as a complex cognitive task and recommends continued research into other contributing factors, such as metacognitive awareness, language proficiency, and motivation, to better support student literacy. Future studies may consider alternative methods or mixed designs to explore this relationship more comprehensively.

Index terms - cognitive biases, reading comprehension, metacognition

INTRODUCTION

Human thought and information processing involve mental activities such as reasoning, remembering, imagining, problem-solving, and judgment. However, these processes are shaped by biases, emotions, and past experiences that can distort judgment. Such cognitive influences affect how individuals perceive the world, shaping their beliefs and behaviors. In reading comprehension, effective thought processing is essential, as Aggleton (2022) asserts that skilled readers visualize, analyze, and think critically to construct meaning from a text. Yet, when cognitive biases interfere, they may hinder accurate interpretation.

Reading comprehension has now assumed a global significance (Unigwe, 2018). The United Nations Children's Fund (UNICEF) reported in 2022 that only 10% of 10-year-olds worldwide could read and comprehend a basic story before the pandemic, promoting a call for governments to prioritize quality education ahead of the 2022 Transforming Education Summit. Similarly, the 2021 Program in International Reading Literacy Study (PIRLS) revealed declining reading achievement, underscoring the urgent need for educational intervention.

This problem is equally pressing in the local context. In 2018, the Philippines recorded the lowest reading comprehension score in the Program for International Student Assessment (PISA). Although slight improvements were observed in 2022, over 75% of Filipino students continued to perform poorly in reading, mathematics, science, and creative thinking (OECD, 2019). These assessments highlight reading comprehension as a pervasive and urgent challenge.

Multiple factors influence reading comprehension, including prior knowledge, oral language, vocabulary knowledge, gender, family background, and school type (Çiğdemir, 2022; Ibrahim et al., 2024; Manguilimotan

et al., 2024; Unigwe, 2018; Spencer et al., 2018). When students have higher levels of these factors, they correlate with stronger reading skills, while deficits contribute to comprehension difficulties. Self-perception also plays a role revealing a significant but generally weak relationship between self-perception and reading performance (e.g., Aktas, 2023, and Lestari, 2020). In the Philippines, college students' reading comprehension performance is at a moderate level (Bilbao et al., 2016). This indicated that they are capable of interpreting, evaluating, and understanding complex texts at a literal, interpretive, evaluative, and creative level with little assistance. Though this is good information, it is still important to note that there exist varied factors that contribute to their poor performance.

According to Tortola (2024), this includes the five factors, which are cognitive abilities, language skills, environmental factors, metacognitive strategies, and motivation and engagement. The deficiency in cognitive abilities, such as working memory and processing speed, which are essential to process and integrate information in the reading process, is closely related to poor reading comprehension. In terms of language skills, he concluded that limited vocabulary and weaker understanding of grammatical structures lead to increased difficulty in comprehending texts. Moreover, environmental factors, such as socioeconomic status and educational background, had an impact on the reading comprehension skills of students, especially from underprivileged backgrounds. Their limited educational resources made them face additional challenges in learning effective reading comprehension strategies. Furthermore, the role of metacognitive strategies in reading comprehension, such as self-monitoring and comprehension monitoring, showed that students who actively engaged with texts and monitored their own understanding demonstrated stronger reading comprehension skills. These results indicated that using effective metacognitive strategies is a key factor in successful reading comprehension, as well as having higher motivation and engagement with reading texts. Yet, these findings suggested that even college students experience various factors influencing their poor reading comprehension, and if left unaddressed, may potentially affect their academic success.

Another critical but less explored factor is cognitive biases—unconscious and systematic errors in thought processes that arise when individuals interpret information, ultimately shaping their decisions and judgments. Such biases distort reality, leading to irrational judgment and interpretation (Kahneman, 2011). In his review, Friedman (2013) argued that researchers have identified over 200 cognitive biases that lead to inaccurate or irrational judgments and decisions, ranging from the actor-observer bias to zero-risk bias. But only 13 are the most common cognitive biases, including the confirmation bias, hindsight bias, anchoring bias, misinformation effect, actor-observer bias, false consensus effect, halo effect, self-serving bias, availability heuristic, optimism bias, and others (Cherry, 2024). These biases were revealed to affect some professional fields. It was found that people who are more susceptible to one cognitive bias are not likely to be similarly susceptible to another (Kakinohana & Pilati, 2023). This means that people can be affected by one cognitive bias but not by others. However, it is essential to note that the effects of these biases on human thought processes and judgment should not be underestimated. Other occupational areas, namely medicine, law, management, and finance, were also affected by biases (Berthet, 2021). In medicine, cognitive bias can lead to the delayed adoption of new scientific findings, incorrect diagnoses (Hammond et al., 2021), and improper treatments. Availability bias, for instance, occurs when a physician relies on recent experience or readily available information to make diagnoses, and this can potentially lead to incorrect conclusions (Mamede et al., 2010, as cited by Berthet, 2021) and inaccurate diagnoses. Another cognitive bias is the omission bias, where physicians may prefer inaction over action to avoid potential harm, even when an action is objectively a better choice (Blumenthal-Barby & Krieger, 2015, as cited by Berthet, 2021). In addition, anchoring bias has also been observed in this professional setting, where initial information disproportionately influences subsequent decisions (Saposnik et al., 2016, as cited by Berthet, 2021).

Cognitive distortions influence decision-making in law, which sometimes lead to unfair rulings and systematic issues in legal proceedings (Berthet, 2021). Anchoring bias is the most prevalent in this field (Berthet, 2021). This is a cognitive shortcut where the initial numerical value influences judgment, notably demonstrated in sentencing and damage assessments (Englich et al., 2006, as cited in Berthet, 2021). Operationally, it means the extent ti which initial textual impression influence comprehension judgments. Hindsight bias, which occurs when individuals perceive past events as having been more predictable than they actually were (Inman, 2016, as cited by Berthet, 2021), affects liability judgments, sometimes leading to exaggerated perceptions of negligence (Oeberst & Goeckenjan, 2016, as quoted by Berthet, 2021). Moreover, confirmation bias in the legal field can lead to wrongful convictions, as investigators and judges may seek evidence that supports their preconceived

beliefs while ignoring contradictory information. Operationally, it refers to the tendency to seek or interpret textual evidence that aligns with one's preconceptions.

Management decisions in the field of management, specifically those that require strategic planning and risk assessment, are influenced by various cognitive biases (Berthet, 2021). Overconfidence bias is pervasive among executives (Ben-David et al., 2013), often leading to excessive risk-taking and poor financial decisions. The framing effect, which describes how decision outcomes are influenced by the way information is presented (Pilat & Sekoul, 2021), significantly impacts managerial decision-making, especially in high-stakes corporate strategies (Hodgkinson et al., 1999, as cited in Berthet, 2021). Additionally, hindsight bias can distort evaluations of past decisions (Cherry, 2024), which can lead to flawed learning processes and hinder the adoption of change or adaptive strategies.

Lastly, cognitive biases also play a crucial role in financial decision-making, affecting individual and institutional investors. Overconfidence bias causes investors to overestimate their ability to predict market movements, leading to excessive trading and suboptimal portfolio management (Barber & Odean, 2000, as cited by Berthet, 2021). The disposition effect, a cognitive bias where investors sell winning stocks too early and hold on to losing stocks too long (Pilat & Sekoul, 2021), has been widely documented in the financial field (Odean, 1998, as cited by Berthet, 2021). Another is herding behavior, where investors follow market trends without conducting independent analysis, which further exacerbates market volatility (Grinblatt et al., 1995, as cited by Berthet, 2021).

In the context of education, Knoff (2025) cited cognitive biases and their impact on educational settings. These biases can significantly influence interaction among staff, students, and administration. This includes the halo effect, anchoring bias, confirmation bias, false consensus effect, and optimism bias. According to Pilat and Sekoul (2021), the halo effect occurs when an individual's overall impressions influence specific judgments about them, and according to Knoff (2025), when initial positive or negative impressions skew later evaluations. For instance, a teacher's first interaction with a student is negative, such as perceiving the student as loud or disruptive. In that case, the teacher may later interact with the student in a way that reinforces this impression.

Anchoring bias is also prevalent in education (Knoff, 2025). Lipnevich (2023) also found that praise might have triggered an anchoring bias, leading to a decrease in motivation and a failure to engage with feedback. As a result, pupils who were reliant on praise did not exhibit the anticipated increases in performance. The introductory praise statement influenced students' interpretations and their responses to the individual feedback they received (Lipnevich, 2023).

Knoff (2025) also noted that confirmation bias influences curriculum selection, staff evaluations, and student-teacher interactions. A reading committee may favor specific educational approaches or research that aligns with their existing views while dismissing evidence that contradicts their preferences (Nikolopoulou, 2022). This decision prevents individuals from considering all relevant information (Nortje, 2020).

Similarly, Catarino (2023) noted the substantial influence of cognitive biases on language learning. Recognizing that confirmation bias is among the most common phenomena observed is essential. This tendency compels individuals to pursue information that aligns with their pre-existing beliefs, often overlooking new evidence that contradicts them. When individuals believe that acquiring a new language is challenging, they tend to focus more on the unfavorable elements of the experience. This leads to the early discontinuation of language acquisition (Catarino, 2023).

Other biases that affect language learning include overconfidence, attribution and anchoring biases, and the Dunning-Kruger Effect (Catarino, 2023). Operationally, it is defined as the disparity between perceived and actual reading comprehension ability. Overconfidence leads to overestimation of one's abilities. An English speaker might believe that learning another language will be quick and easy, and this overconfidence can lead to mistakes and hinder effective language acquisition. For attribution bias, people tend to blame external forces for their failures and attribute their successes to themselves (Caccavale, 2020). For instance, they might assume their natural language abilities are why they performed so well on a language test. On the other hand, they can

attribute their low performance to the teacher's efficacy or the test's difficulty. This tendency might make it challenging to learn from errors and impede language proficiency development (Catarino, 2023).

Furthermore, the anchoring bias often leads us to disregard new information that could be relevant to our decision-making process (Lipnevich et al., 2023) and thought process. Instead, we rely on the initial anchor, which is usually irrelevant to our decision (Pilat & Sekoul, 2021). An anchor can be anything (Kras, 2023). A reader who struggles to understand the first few paragraphs of a complicated text may form a negative impression of the entire piece, leading them to believe they will not be able to understand the text.

In addition, it was also revealed that students tend to overestimate their reading ability but are found to be low on actual performance (Saidalvi, 2022). This suggests that students may be experiencing the Dunning-Kruger Effect, meaning they may have overestimated their knowledge or ability (Dunning, 2011), particularly in reading.

With cognitive biases affecting how individuals process data, cognitive biases may contribute to reading comprehension difficulties. Thus, the study examined the relationship between cognitive biases and reading comprehension. Specifically, it assesses the reading comprehension levels of college students, their susceptibility to cognitive biases, and the correlation between these two variables.

METHODOLOGY

Research Design

This study used a quantitative research approach with an emphasis on a descriptive-correlational design to describe the relationship between cognitive biases and reading comprehension of college students. The chosen approach is appropriate given that this study followed the process of evaluating and analyzing its gathered numerical data which is the nature of quantitative research (Bhandari, 2023). Additionally, according to Creswell (2012), a descriptive correlational design is used to describe and measure the degree of association (or relationship) between two or more variables. Henceforth, this design was appropriate because this study aimed to describe the relationship between students' cognitive biases (independent variables) and reading comprehension (dependent variable).

While the study utilized a descriptive-correlational design to examine the association between cognitive biases and reading comprehension, future research is encouraged to adopt mixed-method or experimental designs to provide a richer, more nuanced understanding of how cognitive biases influence real-time reading processes (Creswell & Plano Clark, 2018).

Respondents

This study involved 62 participants, second-year college students at Partido State University's College of Education, specifically those enrolled in BSEd Science 2 and BSEd Mathematics 2 for the 2024-2025 academic year. They were selected based on the participation criteria including: 1) A reading comprehension level result from Partido State University Reading Center's Science Research Association (SRA) Reading Laboratory Placement/Diagnostic Test result, serving as the secondary data, and 2) Enrolled in Partido State University-College of Education for the academic year 2023-2025 (two consecutive academic years, with a total of four semesters).

More importantly, they were purposely selected, as both of these classes consisted of students with low and high reading comprehension levels, per the secondary data. To address the limitations identified regarding sample size and analytical depth, this study acknowledges its limited statistical power due to a sample of only 62 participants. Future iterations of this research will employ a larger and more diverse sample to enhance the generalizability of findings and the robustness of inferential statistics.

Research Instruments

This study used two sets of instruments to collect the necessary data. The first instrument is secondary data from the Science Research Association (SRA) placement test, provided by the Partido State University Reading

Center, to determine the reading comprehension levels of the participants. The second instrument is adapted from validated cognitive bias scales and contextualized for reading comprehension tasks (Kahneman, 2011; Friedman, 2012). These items were categorized into different cognitive biases: five (5) items for Anchoring Bias, Illusion of Truth Effect, Cognitive Overload Bias, and the Recency Effect; meanwhile, four (4) items for the Dunning-Kruger Effect and Confirmation Bias. The result of reliability testing revealed that the instrument is reliable, with the following acceptable reliability results: Anchoring Bias (0.818); the Dunning-Kruger Effect (.70); Confirmation Bias (.785); Illusion of Truth Effect (.824); Cognitive Overload Bias (.892); and Recency Effect (.928).

Data Gathering Procedures

Prior to the conduct of the study, a free, prior, and informed consent (FPIC) was secured from the College of Education's Dean, and the Partido State University Reading Center director to ensure proper ethical procedures. No conflict of interest was noted in the conduct of the study.

However, the identification of two students with low comprehension aligns with Cabasan's (2011) notion of "frustrated readers"—learners whose restricted reading abilities fall below age and academic expectations. Similar cases were reported by Orellana et al. (2024), who noted that teacher education students often remain below undergraduate text standards despite measurable improvement over time. This suggests that isolated cases of low comprehension, even within otherwise high-performing cohorts, should not be overlooked.

The results highlight a dual reality: while most students are well-prepared for the literacy demands of higher education—including critical analysis and pedagogical application—a minority remains at risk of academic underperformance. This supports Bettinger and Long (2009) and Snyder et al. (2025), who noted that even in college, literacy proficiency is unevenly distributed. Without targeted intervention, these students may experience cumulative academic difficulties, particularly in subjects requiring advanced textual interpretation.

Grounded in Vygotsky's (1987) sociocultural theory, the findings affirm the necessity of scaffolding and individualized support. Current institutional initiatives, such as the university's self-paced reading intervention program, should be strengthened and expanded. Early diagnostics, tailored scaffolding strategies, and the integration of metacognitive approaches (Abdelshaheed, 2019) could help bridge comprehension gaps and ensure that struggling students achieve the literacy benchmarks necessary for both academic success and future teaching effectiveness.

While the overall reading comprehension performance of college students was encouraging, the presence of even a small number of underperforming readers underscores the need for sustained intervention programs. Addressing these gaps not only ensures equity in student learning but also strengthens the literacy foundation of future educators.

RESULTS AND DISCUSSION

Level of Cognitive Biases Susceptibility

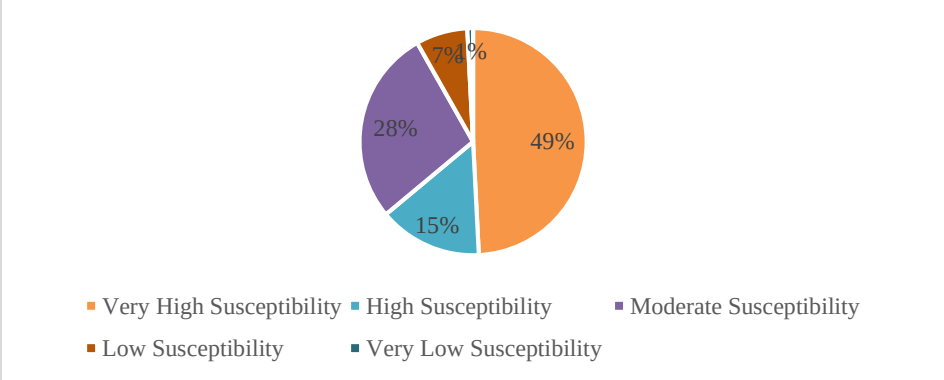

Figure 1. Graph of Level of Cognitive Biases Susceptibility

The results revealed that the college students exhibited an overall moderate susceptibility to cognitive biases, with the majority (54.83%) falling within this range. A smaller proportion (29.03%) displayed high susceptibility, while fewer respondents were categorized as low (14.51%) or very low (1.61%). Notably, no participants registered very high susceptibility. These findings suggest that while cognitive biases are not overwhelmingly dominant in students' reading processes, they occur frequently enough to influence interpretation and comprehension.

The clustered distribution around the moderate level reflects the dual nature of student reasoning: on one hand, they possess sufficient metacognitive awareness to avoid being overly reliant on heuristics; on the other, they remain prone to biases when cognitive load or contextual pressures arise. This aligns with Stanovich and West's (2008) argument that even educated individuals regularly rely on mental shortcuts, particularly when engaged in complex cognitive tasks such as reading comprehension.

The results highlight the importance of equipping students with strategies to recognize and regulate these unconscious distortions. While the absence of very high susceptibility is encouraging, the concentration of students in the moderate and high ranges signals a pressing need for interventions that foster bias awareness and critical reading habits. Such pedagogical approaches can help minimize the subtle but significant effects of cognitive biases on comprehension and ensure that students' reasoning remains grounded in evidence rather than distorted by mental shortcuts.

Relationship Between Cognitive Biases and Reading Comprehension Levels of College Students

Table 1. Level of Relationship Between Cognitive Biases and Reading Comprehension Level among College Students

	1	2	3	4	5	6	7	8
1.	Reading Comprehension Level					_		
2.	Anchoring Bias			-0.022	_			
3.	The Dunning Kruger Effect			-0.022	0.368*	_		
4.	Confirmation Bias			0.025	0.186	0.508*	_	
5.	Illusion of Truth Effect			0.036	0.116	0.507*	0.641*	_
6.	Cognitive Overload Bias			0.002	0.276*	0.389*	0.328*	0.514* _
7.	The Recency Effect			-0.106	0.272*	0.437*	0.490*	0.574* 0.598* _
8.	Cognitive Bias Susceptibility							
	-0.042	0.240	0.440*	0.411*	0.411*	0.392*	0.391*	_

Note: ≥ 0.70 (Very Strong Relationship); 0.40 – 0.69 (Strong Relationship); 0.30 – 0.39 (Moderate Relationship); 0.20 – 0.29 (Weak Relationship); 0.01 – 0.19 (No or negligible relationship)

The correlational analysis revealed no significant relationship between students' reading comprehension levels and their susceptibility to cognitive biases. Despite the majority (96.8%) demonstrating high comprehension, more than half (54.83%) still exhibited moderate susceptibility to biases. This suggests that strong comprehension skills do not automatically protect learners from distorted reasoning, as even proficient readers remain vulnerable to unconscious heuristics when interpreting texts.

This finding highlights the role of metacomprehension—the ability to monitor and evaluate one's own understanding while reading (Thiede et al., 2010). Students with high comprehension may still lack accurate metacomprehension, leading them to overestimate their grasp of a passage or to misjudge the reliability of

information. Such gaps in self-monitoring make them more prone to anchoring, overconfidence, or the illusion of truth effect, even when their fundamental decoding and interpretive skills are strong.

The absence of a strong correlation underscores the need to address comprehension and cognitive bias as related yet distinct areas. Enhancing reading proficiency alone may not suffice; explicit instruction in metacognitive and metacomprehension strategies is essential.

Although this study primarily employed quantitative measures, future research incorporating think-aloud protocols or reflective interviews is recommended to explore students' reasoning patterns and cognitive processing during reading tasks (Pressley & Afflerbach, 1995). Such approaches could reveal how biases manifest in students' interpretive strategies, offering depth beyond what correlational data alone can capture.

Moreover, metacognitive and motivational variables are recognized as potentially mediating or moderating factors between cognitive bias susceptibility and reading comprehension (Flavell, 1979; Zimmerman, 2002). Including these dimensions may reveal whether students' self-regulation or reading motivation mitigates or amplifies the effects of biases.

CONCLUSION

The study revealed that college students generally possess high reading comprehension yet remain moderately susceptible to cognitive biases, with no significant correlation between the two. This outcome suggests that comprehension ability and susceptibility to biases function as distinct constructs: while students may effectively decode and interpret texts, their judgments can still be subtly shaped by unconscious heuristics. Thus, the findings highlight the dual challenge of fostering not only strong comprehension skills but also heightened metacomprehension to ensure accurate, reflective, and unbiased engagement with texts.

RECOMMENDATIONS

While the current findings provide preliminary insight into how cognitive biases relate comprehension, the limited sample size and descriptive design restrict causal interpretation. Thus, the results should be viewed as exploratory rather than definitive. Future studies should adopt experimental or mixed-method approaches, combining quantitative measures with quantitative inquiry, to examine the cognitive mechanisms underlying biased reasoning in reading contexts.

Additionally, to enhance construct validity, researchers are urged to provide clearer operationalizations and contextual examples of each bias, ensuring that these inherently abstract constructs are meaningfully linked to specific reading behaviors.

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