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## Reading Motivation and Retrieval Practice of United States Undergraduates Aged 18 to 23

Robyn M. Perneti

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READING MOTIVATION AND RETRIEVAL PRACTICE OF UNITED STATES  
UNDERGRADUATES AGED 18 TO 23

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## **DEDICATION**

To my parents, Marie and Joseph, who prepared me for life. Their generosity and love are the foundation on which I relied throughout the years. For my sons, Brandon and Jameson, who make my life worthwhile. To my brother Mark and my sister Kerry, for being steadfast and true. To my sister-in-law Mercedes, for her compassionate nature. To the alpha and omega, Jesus Christ, who let me know in Philippians 4:13 of the Bible that “I can do all things through Christ who strengthens me.”

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## **ABSTRACT**

This mixed methods research study examined the reading motivation and retrieval practice ability of U. S. undergraduates aged 18 to 23, as well as the correlations between the two variables, with a focus on gender, year as an undergraduate, and race/ethnicity. A random national sample of 90 undergraduates and an additional minority sample of 17 undergraduates completed an online survey. Quantitative data on reading motivation were derived from an adult reading motivation scale, and qualitative data on retrieval practice were derived from three college-level reading passages. This study filled gaps in the literature and provided insights for future practice and research. Analysis using descriptive and inferential statistics revealed that undergraduates were primarily motivated to read to do well in other realms, and Black students professed stronger reading motivation than Hispanic undergraduates. Regarding retrieval practice, all students other than the seniors and Asian students from the national sample struggled most with the psychology reading passage compared to the intellectual property and copyright excerpt or the U. S. history excerpt. Correlations between reading motivation and retrieval practice proved statistically significant for freshman, Asian, and Hispanic undergraduates from the national sample. A disparity in results showed White students outperforming minorities in retrieval practice.

*Keywords:* reading motivation, retrieval practice, undergraduates, college students, adult reading motivation scale

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## CHAPTER 1: INTRODUCTION

By the time United States public school students reach fourth grade, they show flagging interests in intrinsic reading motivation, faltering achievement motivation, and declining feelings of competence in reading ability (Troyer et al., 2019). In fact, 35% of fourth graders scored below the basic level on reading skills in 2019, prior to the COVID-19 pandemic, and that number rose to 39% in 2022 (*The nation's report card*, 2022).

Why is the fourth grade benchmark so important? Because an estimated two thirds of all fourth graders who cannot read proficiently will end up in jail or on welfare (*Child illiteracy*, 2021; *Infographics*, 2022). Couple this information with the facts that 85% of all juvenile offenders have reading problems, one fifth of high school graduates cannot read their diplomas, 50% of American adults are unable to read a book written for eighth graders, 45 million Americans are marginally illiterate, and 20% of adults cannot read well enough to earn a living wage (*Infographics*, 2022; *Literacy statistics*, 2022), and the issue is clear: Reading motivation is not just a child's problem; it is society's. That lack of reading motivation which leads to illiteracy even comes with a price tag to American taxpayers: \$20 billion (*Literacy statistics*, 2022).

Reading motivation is defined as a person's beliefs, values, and goals associated with reading (Wigfield et al., 2016); and research confirms that reading motivation augments grades and academic success, as well as creates lifelong advantages (Levine et al., 2022). However, little is known about the reading motivation of undergraduates, which has not been studied extensively (Huang & Reynolds, 2022; Kambara et al., 2021).

Moreover, since the body of research on reading motivation has consistently focused on White students, information relating to diverse groups is scant (Castillo, 2020). Consequently, little is known about how differences in gender, race/ethnicity, and age impact reading motivation at the undergraduate level. Moreover, Levine et al. (2022) stated that Americans of all ages read less than their counterparts did in previous decades, and the consequences have created undesirable social and civic reverberations. Though reading more can translate into reading better (Troyer et al., 2019), what happens to those who are not motivated readers? How do they close the achievement gap?

While reading motivation has far-reaching benefits for academic careers and life opportunities, it is also tied to the success of various learning strategies (Agarwal & Bain, 2019). To be specific, retrieval practice is a learning tool that requires motivation (Agarwal & Bain, 2019). Retrieval practice is defined as “an active attempt by a student to recall or recognize, and then reconstruct, their memory of knowledge during initial learning” (Agarwal et al., 2021, p. 1412). It enhances long-term learning and retention of previously studied materials and facilitates future efforts to learn (Yang et al., 2018). Plus, according to a century of research, retrieval practice is an effective learning strategy for grade school students, university students, and mature adults; and it is more effective for memorization and understanding than rereading efforts or lecturing (Agarwal et al., 2020; Moreira et al., 2019; Smarandache et al., 2022). Yet many college students continue to use shallow study strategies such as rereading textbooks and notes instead of engaging in retrieval practice (Smarandache et al., 2022).

Failure to use retrieval practice seems like a lost learning opportunity that can be easily rectified. For instance, retrieval practice can be used by the student or the teacher,

at home or in school (Agarwal et al., 2020). However, it does require student motivation (Agarwal & Bain, 2019); and given the historical changes in reading motivation, coupled with the fact that reading motivation spirals downward throughout the majority of a pupil's education, a chasm is created (Levine et al., 2022). Retrieval practice provides a method to close that gap and overcome academic deficiencies. If students are not reading enough, then at the very least, they need to learn more effectively. Retrieval practice can be used in conjunction with reading motivation or in the absence of reading motivation for the betterment of undergraduate students, and ideally, students of diverse grades and backgrounds.

### **Problem of Practice**

Reading is simply not a preferred pastime for many students today (Levine et al., 2022). With options to enjoy social media, pursue online and in-person activities and clubs, and indulge in every kind of electronic device (to engage in games, videos, or other interactions), individuals of all ages are pulled in many directions that simply do not involve opening a book (Huang & Reynolds, 2022). Despite the opportunities that reading motivation can supply, such as improved school and life success, reading motivation continues to dwindle for the typical student (Castillo, 2020). Sadly, that loss of interaction with the written word year after year is not necessarily counterbalanced with other educational activities (Levine et al., 2022). This researcher knows of far too many students who forego any kind of educational pursuit during breaks or summer vacations and are unenthusiastic or simply ill-equipped to tackle the difficulties related to school success. Many pupils do not even know what retrieval practice is, how it enhances long-term retention of information, or how it compensates for the erosion of educational

excellence (Agarwal et al., 2021). For diverse students or students who lack the motivation to read, retrieval practice could serve as a critical resource. In short, the problem of practice is that reading instruction needs to optimize reading motivation and retrieval practice to increase students' educational opportunities.

### **Research Questions**

1. What is the reading motivation of U. S. undergraduates aged 18 to 23?
2. What is the retrieval practice ability of U. S. undergraduates aged 18 to 23?
3. For U. S. undergraduates aged 18 to 23, how does reading motivation correlate with retrieval practice ability, particularly for different groups (e.g., based on gender, year as an undergraduate, and race/ethnicity)?

### **Purpose**

The purpose of this mixed methods research study was to determine the reading motivation and retrieval practice ability of undergraduates aged 18 to 23. Furthermore, this study focused on how correlations between reading motivation and retrieval practice impacted various groups according to gender, year as an undergraduate, and race/ethnicity. A final purpose was to gauge whether self-professed reading motivation conferred the same academic benefits across distinct groups.

### **Theoretical Framework**

“The theoretical framework is the foundation from which all knowledge is constructed (metaphorically and literally) for a research study” (Grant & Osanloo, 2014, p. 12). For this study, Bruner’s (1961) cognitive constructivist theory and Ryan and Deci’s (2020) self-determination theory formed the theoretical framework. Bruner’s (1961) theory highlights the agency needed by student and teacher to effect learning.

Ryan and Deci's (2020) theory describes the parameters of motivation that influence successful learning.

According to Bruner's (1961) constructivist theory, the objective of education is to fashion autonomous, motivated learners who, while learning to learn, improve their thinking and problem-solving skills while also augmenting their abilities to transfer existing knowledge to new applications. The student is active in the process of learning and must develop a cognitive structure, such as schema or mental models, to synthesize information and experiences, with a goal to "go beyond the information given" (Bruner, 1973, p. 218). The role of teachers is to facilitate this process and to promote discovery learning (Bruner, 1961). *Discovery* is not just the revelation of unknown information but the inclusion of "all forms of obtaining knowledge for oneself by the use of one's own mind" (Bruner, 1961, p. 22). With discovery learning, a student constructs knowledge by developing a coding system for the categorization of information, a system that incorporates his or her unique experiences, beliefs, and attitudes (Bruner, 1961).

Ryan and Deci's (2020) self-determination theory describes the continuum of motivation and how it impacts learning. The impetus to do something, or to be motivated, ranges from amotivation, to external motivation (further categorized as external regulation, introjection, identification, or integration), to intrinsic motivation (Ryan & Deci, 2020). Amotivation indicates an absence of action (Ryan & Deci, 2020). External motivation is expressed for the purpose of gaining some external outcome, such as parent approval or a passing grade in school (Ryan & Deci, 2020). Intrinsic motivation stems from inherent satisfaction, curiosity, or interest in partaking in an activity or completing a task (Ryan & Deci, 2020). Peppered across these degrees of motivation, however, are the



moderating factors of competence, autonomy, and relatedness (Ryan & Deci, 2020).

Because of the relevance of these three psychological needs, motivation can be enhanced or undermined according to whether the student feels competent, autonomous, or related to the context or conditions under which learning is taking place (Ryan & Deci, 2020).

### **Research Design and Methodology**

This convergent, parallel, mixed methods study collected quantitative and qualitative data through an online survey which targeted undergraduates aged 18 to 23 who were pursuing a bachelor's degree at a U. S. college or university or an associate's degree at a U. S. college or vocational/technical school. Mixed methods research was used because it provides a triangulation of data that enhances understanding, strengthens the integrity of the research, and improves credibility (Efron & Ravid, 2020; Schoonenboom & Johnson, 2017). Furthermore, this research study integrated a constructivist worldview, which acknowledged the unique experiences of each student (Efron & Ravid, 2020); and it recognized the importance of validity, trustworthiness, and reliability in creating a research design and methodology.

Initially, pretesting of the survey occurred with a convenience sample of four undergraduates. Then, the survey was distributed through an online research platform. The survey started with the Adult Motivation for Reading Scale (Schutte & Malouff, 2007b), which produced quantitative data from 21 questions using a 5-point Likert scale ranging from 1-Strongly disagree to 5-Strongly agree. Next, students were asked to read college-level excerpts on psychology, business (an introduction to intellectual property, with a focus on the basics of copyright), and U. S. history. Qualitative data were gathered when undergraduates demonstrated retrieval practice by recording all the information

they could recall from the passages they read. Lastly, demographic questions identified the gender, race/ethnicity, year as an undergraduate, state of permanent residence, and other details about the survey participants.

Data were collected from a random national sample of 90 undergraduates in mid-April 2022; and additional data were collected from a cluster sample of 17 minority students from two urban universities in the northeast in October 2022. Data analysis incorporated deductive strategies and descriptive statistics to analyze the results from the Adult Motivation for Reading Scale (Schutte & Malouff, 2007b), and it revealed the overall reading motivation of undergraduates, as well as results of the four dimensions of reading motivation: Reading as Part of Self, Reading Efficacy, Reading for Recognition, and Reading to Do Well in Other Realms (research question 1). Also, various deductive and inductive analyses, such as coding processes and analytic memo writing, were implemented to interpret the qualitative findings for retrieval practice (research question 2). Lastly, correlation analysis revealed connections between the two variables (research question 3).

### **Positionality**

I have homeschooled my two sons over the course of 22 years, and I have been fortunate to instill in them a love of reading. Their reading motivation has enhanced their education, but the cultivation of their literacy was no accident. I provided them with a literature-rich environment and a home filled with books and reading materials, thereby integrating reading with daily life. Though I realize that most students do not have the opportunity or inclination to read at least 1,000 books per year for each year of their education, my sons eagerly met that benchmark, all while taking the initiative to read

often in their free time. However, not all homes or learning environments promote the power of reading motivation, and I have often wondered how students who are not motivated readers will fare as they advance to college. In addition, I have contemplated whether retrieval practice, either in association with reading motivation or in its stead, might bridge any deficits in learning.

I initiated this research study as a researcher and educator who was a bibliophile with a strong respect for the written word. Also, I enjoyed the privilege of a far-reaching and comprehensive education, which included multiple graduate-level degrees. Furthermore, I watched as my older son, armed with the power of reading motivation and retrieval practice skills, progressed through his undergraduate years with great success. In truth, my deliberate investment in his education reaped great dividends. As a result, my belief in both reading motivation and retrieval practice as efficacious learning tools remained unassailable. Yet I knew that not all undergraduates enjoyed the advantages that I had sown for my older son – and every undergraduate deserves those benefits. From this purview, I brought my beliefs, interests, and values to this project.

For years, I have known about retrieval practice through its less scientific name, *narration*. In the homeschool world, narration is always associated with Charlotte Mason, a turn-of-the-twentieth-century, British educator. Narration requires students to relate in their own words what they just read or heard. It is a highly effective teaching tool that requires the student to pay attention, recall information, and assimilate details (Sendra Ramos et al., 2022).

My philosophy of education is simple: Strive for excellence. My position is to determine how combinations of reading motivation and retrieval practice facilitate

learning. I have observed students with exceptional reading abilities who employ few study strategies and barely engage in retrieval practice, simply because their retention of material is so high. Conversely, I have noticed students who read well but still struggle with retrieval practice. So, reading motivation, despite all the studies that extol its virtues, does not appear to automatically confer benefits to retrieval practice ability. Likewise, reading motivation might not benefit genders and races/ethnicities in the same way. Therefore, I want to explore how students can maximize their learning with retrieval practice, regardless of their reading motivation. This is an important area to explore, especially for students who are less skilled readers or who are not very motivated to read. These students might be able to overcome academic and achievement gaps by employing retrieval practice to learn more effectively.

### **Limitations**

Limitations for this study involved constraints posed by time, money, and access to the desired population. In addition, the Adult Motivation for Reading Scale (Schutte & Malouff, 2007a) might have been unsuitable to non-Australian cultures, and the Scale might have had an insufficient number of items to correctly measure the four factors of reading motivation. Plus, the researcher was unable to confirm if Pollfish, the online market research platform used to disseminate the online survey, engaged an audience that varied significantly from the actual target population of undergraduates. Furthermore, surveys use self-reports, and respondents are subject to social desirability bias (Efron & Ravid, 2020). Students might have attempted to appear in ways that contrasted with their actual attitudes and beliefs. Lastly, participants might not have done their best on the retrieval practice section of the survey because they did not spend sufficient time to

complete the survey; or they might have lost focus or experienced reading fatigue. In truth, the retrieval practice questions required detailed answers and significant effort, but nothing was at stake if students did poorly.

### **Significance of the Study**

Reading motivation and retrieval practice are complex topics that warrant ongoing research (Agarwal et al., 2020; Huang & Reynolds, 2022). Many questions revolve around the conceptualization of reading motivation and the degree to which various factors, such as retrieval practice, augment, subdue, or nullify reading motivation. However, gaps in the literature indicate that research on the reading motivation of undergraduates is rare (Huang & Reynolds, 2022; Kambara et al., 2021). Even rarer is information on the correlation between reading motivation and retrieval practice of undergraduates aged 18 to 23.

The significance of this study was that it produced “valid and vital knowledge” for stakeholders and learning communities (Wamba, 2011, p. 174). Specifically, this research study addressed gaps in the literature related to both the reading motivation and retrieval practice of undergraduates; and it highlighted the value of these variables on diverse groups, especially according to gender, year as an undergraduate, and race/ethnicity. Furthermore, insights derived from this research study could direct educators to create interventions and pathways for the academic success of varied student populations and could even impact curriculum and pedagogy in diverse educational settings. Lastly, though this study has undoubtedly augmented the researcher’s development as an educator/researcher, its value came from its ability to proffer options and opportunities for social justice and to spark change (Storm, 2016).

## **Organization of Dissertation**

Chapter 1 of this dissertation introduces the topic and the problem related to reading motivation and retrieval practice, as well as the conceptual framework for the research study. Chapter 2 provides the theoretical framework and literature review of reading motivation and retrieval practice. Chapter 3 explains the methodology, with the research design, data analysis strategies, and limitations that create the structure for the research study. Chapter 4 presents the quantitative results and qualitative findings derived from the national and minority samples. Chapter 5 supplies an overview of this research study, a discussion of strategies to advance reading motivation and retrieval practice efficacy, comments about the researcher's development, and recommendations for future research.

## **Definition of Terms**

**Adult Motivation for Reading Scale:** Created by Schutte and Malouff (2007a), this scale is designed to gauge the reading motivation of adults. It distinguishes four factors of adult reading motivation: Reading as Part of Self, Reading Efficacy, Reading to Do Well in Other Realms, and Reading for Recognition.

**Reading motivation:** an individual's values, beliefs, and goals related to reading (Wigfield et al., 2016). "To be motivated means *to be moved* to do something. A person who feels no impetus or inspiration to act is thus characterized as unmotivated, whereas someone who is energized or activated toward an end is considered motivated" (Ryan & Deci, 2000a, p. 54).

**Retrieval practice:** "the act of recalling previously learned information" (Agarwal et al., 2021, p. 1409). More specifically, it is "an active attempt by a student to recall or

recognize, and then reconstruct, their memory of knowledge during initial learning”  
(Agarwal et al., 2021, p. 1412).

Retrieval practice may also be known as **narration, testing effect, or test-enhanced learning.**

**Undergraduate:** a student pursuing a bachelor’s degree at a college or university or an associate’s degree at a college or vocational/technical school.

## CHAPTER 2: LITERATURE REVIEW

Students of today do not read as much as their counterparts of past decades did (Levine et al., 2022). In fact, for most students, reading motivation plummets over the course of the student's life, despite the academic and career benefits that evolve from reading motivation (Castillo, 2020). Data on the reading proficiency of fourth and eighth graders from the National Assessment of Educational Progress made that very clear: National test scores from 2022 fell below pre-COVID-19 scores of 2019 and dropped to 1992 levels (*The nation's report card*, 2022). Males continued to trail females; and Black and Hispanic students were unable to close the gap with their White peers (*The nation's report card*, 2022). Now, questions remain about how to bring U. S. students back to levels of proficiency and college readiness after losing what equates to a year of learning for many (*The nation's report card*, 2022). Moreover, many undergraduates are uninformed about retrieval practice and do not realize how it can improve the retention of information (Agarwal et al., 2021). Consequently, students are forfeiting two significant tools (reading motivation and retrieval practice) that could maximize their educational opportunities and outcomes.

The purpose of this research study was to address the gaps in literature about undergraduates' reading motivation while also measuring these students' retrieval practice skills. By discovering the connections between these two variables, this study provided insight into how correlations between reading motivation and retrieval practice



impacted discrete groups. Such knowledge could enable students to implement practices to overcome academic deficits and to enhance skills.

The major themes of this chapter included a restatement of the research questions, followed by the purpose and methodology of the literature review. Bruner's (1961) cognitive constructivist theory and Ryan and Deci's (2000a) self-determination theory were explored as the overarching theoretical framework for this research study. Lastly, a thorough review of the literature, including historical perspectives, implications for social justice, and related research, were provided for reading motivation and retrieval practice.

### **Research Questions**

1. What is the reading motivation of U. S. undergraduates aged 18 to 23?
2. What is the retrieval practice ability of U. S. undergraduates aged 18 to 23?
3. For U. S. undergraduates aged 18 to 23, how does reading motivation correlate with retrieval practice ability, particularly for different groups (e.g., based on gender, year as an undergraduate, and race/ethnicity)?

### **Purpose and Methodology of the Literature Review**

A valuable literature review starts with a general search, progresses to a surveillance and critique of the results, and then furthers the examination of studies most relevant to the topic (Machi & McEvoy, 2012). An assessment of literature is crucial because not all studies are relevant to the topic or useful in the construction of a meaningful literature review (Herr & Anderson, 2015). Furthermore, the literature review does not just inform the researcher of the topic's history, theory, or application; it lights

the path of inquiry and orients both reader and researcher to the worth and necessity of a new avenue of research (Herr & Anderson, 2015).

For this dissertation, the strategies to review the literature included the use of search engines and databases such as ERIC, Education Source, EBSCOhost, PsycINFO, PsycTESTS, and Google Scholar. With key word searches using terms such as *reading motivation*, *retrieval practice*, and *undergraduates*, results ranged from 2022 publications to seminal studies from the 1960s. The majority of resources used were peer-reviewed journals. Additional resources were discovered by culling through the references of the most salient articles on reading motivation and retrieval practice.

### **Theoretical Framework**

Two theories undergird this research study of reading motivation and retrieval practice for undergraduates aged 18 to 23: Bruner's (1961) cognitive constructivist theory and Ryan and Deci's (2020) self-determination theory. Each theory applies to the construction and motivation needed to effect learning within reading motivation and retrieval practice. Furthermore, self-determination theory is the basis for many studies on reading motivation and its impact on students of all ages and abilities. Plus, the Adult Motivation for Reading Scale (Schutte & Malouff, 2007a), which was present in the online survey to gauge undergraduates' reading motivation, was designed with Ryan and Deci's self-determination theory in mind. Retrieval practice is also linked to both theories because it requires constructivist efforts and motivation to be successful (Agarwal & Bain, 2019).

## **Bruner's Cognitive Constructivist Theory**

Bruner's (1961) cognitive constructivist theory highlighted the ways a student learns and outlined a path toward maximizing capabilities. From the earliest of ages, individuals experience three modes of representation, which account for the means by which information is deposited and encoded to memory. Those modes of representation are as follows: enactive, in which action-based information such as muscle memory is stored in memory; iconic, in which mental pictures or images are stored either consciously or unconsciously in the mind; and symbolic, in which coded or symbolic language is stored in the mind (Bruner, 1966). These modes mesh and are supported by language, which is critical to the harnessing of conceptual understanding and abstract thought (Bruner, 1966).

Knowledge construction is unique to each learner, who must be active in the process of learning (Bruner, 1961). Furthermore, constructivist efforts include cognitive, physical, emotional, and social experiences in which learning does not take place in isolation but in the context of life's experiences (Rannikmäe et al., 2020). Pre-existing knowledge is acted upon to create, complement, and supplement existing levels of understanding (Rannikmäe et al., 2020). In fact, with cognitive constructivism, individuals do not resort to rote learning but must construct, organize, and categorize information in a self-designed coding system that allows them to promote discovery learning (Bruner, 1961). Discovery involves the acquisition of knowledge as well as the active process of engaging the mind to gain knowledge through any means (Bruner, 1961).

Because the construction of acquired knowledge is subjective, each person builds his or her own understanding from assimilated beliefs, attitudes, and stored information (Rannikmäe et al., 2020). Moreover, as the individual develops a cognitive structure to synthesize information and experiences, he or she attempts to “go beyond the information given” (Bruner, 1973, p. 218). Essentially, the learner needs to be autonomous and motivated to surpass past thinking and problem-solving abilities while also expanding capabilities to transfer current knowledge to new circumstances (Bruner, 1961).

Though teachers cannot directly observe the process of cognitive construction taking place in each student’s mind, they do have a specific role (Bruner, 1961). In fact, Bruner (1966) described a theory of instruction that contains four aspects: the inclination to learn, the way knowledge is structured to facilitate learning, the presentation of information, and the type and scheduling of rewards and punishments. In response to this theory of instruction, educators should not only foster discovery learning in each student but should also provide scaffolding, which is structured aid given by the teacher to the student to help the student be successful with a task or goal (Wood et al., 1976). Scaffolding works to develop tiers of learning. In addition, as teachers gauge each student’s readiness to learn, they can implement a spiral curriculum, which arranges information to be taught with incremental levels of difficulty (Bruner, 1960). As students progress from simple to complex renditions of a subject, they extend the boundaries of their comprehension (Bruner, 1960).

## **Ryan and Deci's Self-Determination Theory**

Ryan and Deci's (2020) self-determination theory was a framework that provided a taxonomy of motivation. "To be motivated means *to be moved* to do something. A person who feels no impetus or inspiration to act is thus characterized as unmotivated, whereas someone who is energized or activated toward an end is considered motivated" (Ryan & Deci, 2000a, p. 54). Moreover, self-determination theory accounts for the level and orientation of motivation, and it illuminates the rationale for why people act (Ryan & Deci, 2020). So, while motivation can result from curiosity or interest, from the desire for approval or a good grade, or from utility or interest in obtaining a skill, the type and temperament of that motivation varies according to circumstance (Ryan & Deci, 2020).

According to the taxonomy of Ryan & Deci (2020), amotivation and intrinsic motivation flanked four types of extrinsic motivation, which were identified as external regulation, introjection, identification, and integration. Amotivation is demonstrated by a person's absence of action, which typically results from feelings that the activity has little value or relevance (Ryan & Deci, 2020). In contrast, extrinsic motivation spans a range of constructs which are completed for the purpose of "some separable outcome" (Ryan & Deci, 2000a, p. 60). Across the continuum of external motivation, a person's concept of internalization changes from noncompliance to passive compliance and results in growing perseverance, self-perceptions, and involvement (Ryan & Deci, 2020). For example, external regulation signifies behavior that does not feel autonomous; it is exhibited for the sake of an external requirement or reward (Ryan & Deci, 2020). Introjection explains that people act to evade guilt or to elevate pride (Ryan & Deci,

2020). The ego is involved (Ryan & Deci, 2020). Additionally, identification demonstrates a level of autonomy or self-determination, and the individual finds a way to justify the importance of a task. Lastly, integration acknowledges a self-examination of circumstances that leads the individual to feel some congruence and autonomy (Ryan & Deci, 2020). The person recognizes little conflict, and because the reasons for acting are assimilated, that person can reach a state of self-determination (Ryan & Deci, 2020).

Intrinsic motivation is particularly relevant to educational environments and is a “prototype of self-determined activity” (Ryan & Deci, 2000a, p. 62). It stems from innate satisfaction and enjoyment in pursuing a task. Plus, it correlates with a person’s natural interest in learning and the desire for competence and autonomy (Ryan & Deci, 2020). While intrinsic motivation can be enhanced or supplanted by teacher and parent actions, it produces quality learning and creativity when harnessed effectively (Ryan & Deci, 2020).

Along with these motivations, three psychological needs are fundamental to growth and well-being: autonomy, competence, and relatedness (Ryan & Deci, 2020). Autonomy recognizes that a person’s initiative and acknowledgement of personal choices can be supported when experiences are interesting and valued, or they can be undermined when events are dictated by external forces (Ryan & Deci, 2020). Competence relates to the belief that a person can grow, improve, and attain mastery (Ryan & Deci, 2020). Relatedness coordinates belonging and connection, which can be amplified through thoughtful and respectful interactions (Ryan & Deci, 2020). Interference with any of these three needs impairs motivation (Ryan & Deci, 2020). In general, intrinsic motivation and the extrinsically motivating constructs of internalization and integration

best align with basic psychological needs, and classroom conditions that take these factors into account are more likely to foster an environment of success for students compared to classrooms that do not address these needs (Ryan & Deci, 2020).

### **Reading Motivation**

Reading motivation is defined as an individual's values, beliefs, and goals related to reading; and it dictates reading performance even when accounting for cognitive abilities, background knowledge, decoding skills, and prior reading performance (Wigfield et al., 2016). Researchers mention intrinsic and extrinsic motivation; reading attitude, self-concept, and self-efficacy; task value; and goal orientations to explain why an individual chooses to read (Troyer et al., 2019). However, many reasons contribute to a student's decision not to read. As students gain an understanding of their own performances and abilities, and with the increase in classroom evaluation, such as class ranking, formal testing, and social comparisons, interest in reading wanes (Troyer et al., 2019). With detractors such as dense and unappealing texts, limited choices and types of reading topics and materials, stifled autonomy, and minimal relatedness to lives and goals, reading motivation remains depressed (Wigfield et al., 2016).

Reading motivation produces lifelong benefits (Castillo, 2020). For example, not only does intrinsic motivation in fourth grade predict student reading achievement in later grades, but reading motivation enhances reading comprehension for life, in general (Troyer et al., 2019). Because it is integral to overall school achievement, career options, and life experiences, the examination of its many dimensions, associations with other reading-related skills and beliefs, and applications is highly relevant (Levine et al., 2022).

This literature review explores many of the variables impacting reading motivation and synthesizes existing research to expose gaps while addressing theories, types of motivation, mediators, and moderators that make this topic so challenging. Finally, this review identifies gender differences and undergraduate requirements related to reading motivation.

### **Motivation Theories Related to Reading**

Two motivation theories are particularly popular in reading motivation research. First, self-determination theory creates a framework for intrinsic motivation, autonomous extrinsic motivation, and psychological wellness (Ryan & Deci, 2020). Intrinsic motivation is internal and derives from curiosity, interest, or enjoyment (Ryan & Deci, 2020). External motivation evolves from external values and pressures, such as the desire to get good grades or gain parent or teacher approval (Ryan & Deci, 2020). Though a person seeks psychological growth, that growth is not automatic; it needs support in the form of autonomy (“the experience of a sense of volition or psychological competence”), competence (“the experience of being confident and effective in action”), and relatedness (“the experience of feeling connected to and accepted by others”) (De Naeghel et al., 2014). These three conditions promote autonomous motivation (Ryan & Deci, 2020). An autonomous individual initiates or self-determines his or her own actions or behavior and is motivated to read due to pleasure, interest, or personal value (Ryan & Deci, 2020).

The second theory that is often applied to reading motivation is the expectancy-value theory (Castillo, 2020). This theory explains that students need to associate expectancy beliefs, such as the schemata related to ability conceptions and self-efficacy beliefs, with value beliefs, which integrate motivation and goals with subjective task



values (Becker & McElvany, 2018). Self-efficacy is the confidence a person has in the ability to complete a task (Castillo, 2020). If the student can tie short- and long-term goals to interest, attainment, and utility values, then achievement, desired behaviors, and performance are more likely to be realized (Becker & McElvany, 2018).

### **Types of Reading Motivation: Intrinsic, Extrinsic, Affirming, Undermining**

Van Steensel et al. (2019) identified positive and negative components of reading motivation. For instance, reading motivation is not solely catalyzed by whether and to what degree affirming factors are in place. The level of motivation does not rest along a static or potentially positive continuum. On the contrary, reading motivation includes undermining motivations that actively destroy and erode reading motivation, and they are readily present in boys and older adolescents (van Steensel et al., 2019).

Negative motivations, with variables such as perceived absence of competence and work avoidance, are a distinct motivational construct (Rosenzweig & Wigfield, 2017). Meanwhile, affirming motivations are not just at the opposite end of the continuum from undermining motivations; the two are separate constructs and indicate disparate affects (van Steensel et al., 2019). Moreover, high and low intrinsic motivation may both fall along the positive continuum, but a person with low intrinsic motivation can be showing indifference (still on the positive motivation scale) as opposed to displaying low intrinsic motivation out of aversion or avoidance, which demonstrates negative affect (van Steensel et al., 2019).

### **Dimensions of Reading Motivation**

Identifying the dimensions of reading motivation is critical to understanding its complexity and how it impacts reading competence and reading behavior (Wang et al.,

2020). One popular tool is the Wigfield and Guthrie (1997) Motivation for Reading Questionnaire, which explicates 11 dimensions of reading motivation. It captures dimensions such as curiosity, competition, recognition, challenge, involvement, grades, social factors, efficacy, compliance, and work avoidance (Schiefele et al., 2012). In contrast, Schiefele et al. (2012) named 14 categories, including curiosity, competition, grades, rewards, and efficacy. Meanwhile, Nolen (2007) stated that individuals are likely to define motivation differently depending on the situation and time, and their definitions will vary from the definitions of others. Nolen (2007) then determined eight categories of motivation: interest, enjoyment, mastery, required school reading, utility reading, ego concerns, social motives, and reading avoidance. Additionally, Schaffner and Schiefele (2007) created the categories of relieving boredom, filling time, and facilitating sleep as reading motivators.

### **Mediators and Moderators of Reading Motivation**

Many mediating and moderating factors influence or are influenced by a person's reading motivation. For instance, many researchers argue that intrinsic reading motivation positively impacts reading comprehension, and extrinsic motivation negatively influences reading comprehension (Troyer et al., 2019). However, Troyer et al. (2019) asserted that the amount of reading mediates the impact of motivation on reading comprehension, perhaps because intrinsic motivation boosts a person's time spent reading, and extrinsic motivation negatively correlates with both reading amount and comprehension. However, the causal directions among reading motivation, reading amount, and comprehension are debatable (Troyer et al., 2019). Furthermore, reading motivation is linked to reading behavior, which accounts for a person's preferences and

strategies for reading, as well as the amount read (Miyamoto et al., 2018). Other factors are not as obviously reading-related. For instance, a person's home environment can elevate or diminish a student's reading motivation; and a person's valuation of an activity, and whether it is useful or interesting, is not only a dimension of reading motivation but a potential mediator or moderator (Castillo, 2020).

Outside of school, motivated children read three times more than their peers (Wigfield & Guthrie, 1997); and ultimately, frequent readers become skilled readers (Miyamoto et al., 2018). Therefore, a lack of reading practice perpetuates reading difficulties and stunted motivation (Miyamoto et al., 2018). However, due to the bidirectional relationship between reading motivation and reading skills, low motivation is both the cause and effect of low skill levels (Miyamoto et al., 2018). So, interventions aimed at supplementing depressed motivation and subpar skills would be most effective in raising students' reading motivation (Miyamoto et al., 2018).

### **Gender Differences as Factors in Reading Motivation**

Boys and girls view reading differently, despite the fact that reading skills impact understanding across many school subject domains and influence socioeconomic attainment for all (Hochweber & Vieluf, 2018). For instance, from kindergarten through twelfth grade, girls value reading more than boys do; exhibit greater intrinsic reading motivation; demonstrate superior reading comprehension; and read more often than boys do (Hochweber & Vieluf, 2018). Furthermore, girls and boys display divergent beliefs about reading competence and express dissimilar reading choices (Schwabe et al., 2015). Overall, girls tend to outperform boys across most reading-related categories, and boys

consistently demonstrate less reading competence than girls (Hochweber & Vieluf, 2018). This imbalance continues throughout adolescence (McGeown et al., 2015).

### **Undergraduates' Reading Motivation**

Reading motivation is defined as the personal thoughts, beliefs, and perceptions which catalyze reading-related activities (Unrau & Quirk, 2014). Reading at the college level requires strategy and motivation, and it mandates cognitive processing demands which must handle the sophisticated concepts of textbooks, difficult and unfamiliar topics, a vast amount and range of types of reading, and a variety of course requirements stemming from reading assignments (Huang & Reynolds, 2022). In short, it is mandatory for academic success in higher education (Cantrell et al., 2018). Plus, reading motivation is a primary factor in overall reading achievement and successful functioning in society for undergraduates (Huang et al., 2022; Levine et al., 2022).

Even though reading motivation promotes reading achievement and general school accomplishment, undergraduates' reading motivation has never been extensively researched (Huang & Reynolds, 2022; Kambara et al., 2021). Moreover, according to Davis et al. (2018), the only scale available for testing the reading motivation of adults is the Adult Motivation for Reading Scale (Schutte & Malouff, 2007a). However, Kambara et al. (2021) cautioned that the Scale might not be generalizable to non-Australian groups; it was developed using only Ryan and Deci's (2020) self-determination theory; and difficulties existed in determining whether the Scale's constructs and items functioned similarly in female and male students.

Currently, many university students address their reading and learning with a surface approach (Smarandache et al., 2022). A surface approach indicates that the

student accepts what is read as isolated fact and information (Smarandache et al., 2022). Consequently, reading results in the superficial retention of information that neither promotes understanding nor long-term retention (Smarandache et al., 2022). This type of student is more motivated to obtain qualifications for a job than to extend personal curiosity or ambition, and his or her academic engagement is minimal and passive (Huang & Reynolds, 2022). In contrast, an undergraduate who is academically committed displays true motivation. The committed student takes a deep approach to reading and learning. A deep approach describes a student who constructs knowledge from what is read, uses background information that is relevant to create meaning, and is actually primed to teach himself or herself (Huang & Reynolds, 2022).

Despite the demands of higher education, teens entering college have maintained the negative trend of past years and have demonstrated the worst levels of reading proficiency in over a decade (*ACT*, 2019). In fact, only Asian students have increased their readiness in recent years (*ACT*, 2019; *SAT*, 2022). Overall, only 45% of *ACT*-tested graduates met reading benchmarks for college readiness (*ACT*, 2019). In response, Huang and Reynolds (2022) averred that subpar literacy skills could be a negative catalyst for undergraduates' reading motivation. College students can become non-readers when they cannot overcome challenging or unfulfilling reading activities (Huang & Reynolds, 2022).

Despite the general sense that reading motivation at the collegiate level is not where it needs to be, existing research has struggled to differentiate how various constructs, such as gender, race/ethnicity, grade, and college major impact reading motivation (Huang & Reynolds, 2022). Moreover, without a body of literature focusing

on the reading motivation of college students, numerous scholarly publications have correlated quantity of time spent reading with actual reading motivation (Huang & Reynolds, 2022). The conclusion was that Americans read less now than their counterparts did in the past (Huang & Reynolds, 2022). Consequently, because they read less well, this degeneration has resulted in unfavorable social, civic, and economic repercussions (Huang & Reynolds, 2022). In contrast, those who read more tend to read better (Huang & Reynolds, 2022). Motivated readers accrue a quantity of reading that translates into quality reading.

Huang and Reynolds (2022) addressed deficits in the literature by conducting a study using the Motivation for Reading Questionnaire with 1,437 American college students. To start, Huang and Reynolds (2022) recognized that reading motivation has many dimensions and constructs, but they identified the following four constructs for their study: self-efficacy, intrinsic motivation, extrinsic motivation, and social motivation. The researchers then correlated these constructs with student demographics such as age, gender, race, and grade (Huang & Reynolds, 2022).

In assessing the students' self-reports, Huang and Reynolds (2022) identified that the most compelling construct for college students' reading motivation was extrinsic motivation, followed by intrinsic motivation, self-efficacy, and then social motivation. In addition, grades, whether obtained for the student's major or non-major, influenced student self-efficacy, as well as intrinsic, extrinsic, and social motivation (Huang & Reynolds, 2022). These findings confirmed prior research that grades were a positive motivator for undergraduates' reading motivation and were valued as markers of success (Huang & Reynolds, 2022). Plus, student interest in recognition and competition had the

potential to increase reading motivation (Huang & Reynolds, 2022). Though extrinsic motivation is frequently portrayed as a negative motivational factor for students in elementary school or middle school, this study corroborated other research that claimed extrinsic motivation was a compelling, positive force for undergraduates (Huang & Reynolds, 2022). In short, for college students, reading motivation was a pathway to task completion, graduation, and better career opportunities (Huang & Reynolds, 2022).

Huang and Reynolds (2022) also noted that student demographics impacted the results for the four constructs of reading motivation. For instance, females rated higher than males across all four scales (Huang & Reynolds, 2022). This disparity, in which females tend to outperform males, has been well-documented in past research for students of all ages (Huang & Reynolds, 2022). Also, freshmen scored higher on social motivation as a reason to read compared to sophomores, juniors, or seniors (Huang & Reynolds, 2022).

Asian students showed the lowest scores on self-efficacy and the highest scores for social motivation compared to other ethnic groups (Huang & Reynolds, 2022). These results coincided with Asian cultural norms related to a collectivist mentality and traditions of humbleness and modesty (Huang & Reynolds, 2022). In contrast, African American students demonstrated the highest scores for self-efficacy and intrinsic motivation compared to other groups (Huang & Reynolds, 2022). This study confirmed that the African American students' reading motivation was related to the value of education and its ability to transform lives (Huang & Reynolds, 2022). These students recognized that the educational opportunities they gained at college would not only elevate them but their families and communities, as well (Huang & Reynolds, 2022).

## **Retrieval Practice**

Retrieval practice is defined as “the act of recalling previously learned information” (Agarwal et al., 2021, p. 1409). More specifically, from an operational point of view, it is “an active attempt by a student to recall or recognize, and then reconstruct, their memory of knowledge during initial learning” (Agarwal et al., 2021, p. 1412). Its value to education is that it has consistently been an effective strategy for boosting long-term learning (Agarwal et al., 2021; Glover 1989; Myers, 1914; Spitzer, 1939).

As studies have moved from the laboratory to the classroom, researchers have demonstrated how retrieval practice benefits students from elementary school through medical school; and it aids learning across a variety of school settings and content areas (Agarwal et al., 2021). Furthermore, retrieval practice is effective across many experimental designs, varied retrieval and final test formats, and discrepant timings of retrieval practice and feedback (Agarwal et al., 2021). So, across the curriculum, from history and math to foreign languages and science, or when using frequent recall prompts, multiple-choice online apps, quizzes within lectures, or other techniques, researchers have seen positive results and have encouraged educators to implement retrieval practice in classroom settings (Agarwal et al., 2021).

Regardless of the many favorable research outcomes, research still needs to distinguish when and how retrieval practice enhances student learning. For instance, laboratory settings can create confounds, and results will not necessarily translate into real-life settings (Agarwal et al., 2021). Furthermore, applied settings have varied drastically in their implementation and format for assessing retrieval practice (Green et al., 2018). For example, Jaeger et al. (2015) used encyclopedia excerpts, and some



students demonstrated retrieval practice in an online environment that was not supervised (Burdo & O'Dwyer, 2015). Other students engaged in retrieval practice in computer labs at the conclusion of class lectures (Wiklund-Hörnqvist et al., 2014). In short, studies have involved various settings, formats, and implementation methods to appraise the retrieval practice of students.

### **Similar Terms for Retrieval Practice: Testing Effect, Testing, Test-Enhanced Learning**

Some researchers identify retrieval practice as the “testing effect,” “testing,” or “test-enhanced learning,” but these latter terms are not always interchangeable with “retrieval practice” (Agarwal et al., 2021). Though all these concepts promote long-term learning and memory, a term like “testing effect” or “testing” does not necessarily correlate with assessments that are summative or standardized (Agarwal & Bain, 2019). Retrieval practice incorporates both recall and recognition during the early stages of learning but does not necessarily take the form of a test (Agarwal et al., 2021). Moreover, retrieval practice may be exhibited with free recall, and the stakes might be low or nonexistent for students (Agarwal et al., 2021). In essence, retrieval practice highlights the process of recall, not the test itself (Agarwal et al., 2021).

### **Retrieval Practice as a Learning Strategy**

Retrieval practice improves long-term learning and retention of previously studied information, a phenomenon known as the backward effect of testing (Yang et al., 2018). Moreover, retrieval practice creates a forward effect of testing, in which the student, because of past efforts with retrieval practice, will be more successful in recalling new knowledge – and that new information does not even need to be related to

the prior information (Yang et al., 2018). Using retrieval practice to learn new material is a phenomenon known as test-potentiated new learning (Sotola & Crede, 2020).

Retrieval practice does not focus on putting information into the student's head but getting it out (Agarwal et al., 2020); and retrieval practice accomplishes that feat without adding burdens to teachers or school districts. It does not require additional technology, money, or class time (Agarwal et al., 2020). Furthermore, backed by 100 years of research, retrieval practice is a proven learning strategy as opposed to an assessment tool (Agarwal et al., 2020). It can take the form of quizzes, exams, homework, or oral questioning – whatever allows the student to practice what was learned (Agarwal et al., 2020). It is more powerful than lecturing students or having them reread course materials or take notes (Agarwal et al., 2020). It may even reduce test anxiety (Agarwal et al., 2014).

Retrieval practice enhances memorization and understanding, and it draws on working memory during the cognitive process to maximize effectiveness (Agarwal et al., 2020). Plus, it promotes metacognition, which allows students to differentiate what they know from what they do not know (Agarwal et al., 2020). Moreover, retrieval practice adds flexibility to thinking (Agarwal et al., 2020). In other words, students can improve their complex thinking and the skills associated with applying knowledge in different contexts. Retrieval practice also encourages the organization of information and the transfer of that information to discrete concepts (Agarwal et al., 2020). Plus, the harder the retrieval practice, the greater the long-term gain in memory retention of that information (Agarwal et al., 2020). However, ways of learning incorporate effort,

motivation, and memorization skills, any combination of which will impact retrieval practice (Agarwal & Bain, 2019).

### ***Spaced Retrieval Practice***

Spaced retrieval practice occurs in multiple sessions over a variety of time periods (Carpenter & Agarwal, 2020). It is the opposite of cramming, in which a student studies excessively in a long session prior to an exam (Smarandache et al., 2022). Cramming puts information into short-term memory but not long-term memory (Carpenter & Agarwal, 2020). Spaced retrieval foments consolidation and fosters memory retention (Agarwal et al., 2020). In addition, that learning is not just memorized but understood, and it can be transferred or applied to other circumstances – a primary objective of education (Pan & Agarwal, 2020). Also, the gains accrued from spaced retrieval practice endure over weeks and months; and those benefits are achievable for an array of students, from the newest entrants into a school system to medical students scrutinizing how to perform surgery (Carpenter & Agarwal, 2020).

### ***Interleaved Retrieval Practice***

Another kind of retrieval practice is interleaved practice. Interleaving the practice means studying more than one subject or skill, or alternating problem or example types (Sana & Yan, 2022). For instance, instead of doing a cluster of the same type of math problem, a student should study several types of problems that require varied solutions (Sana & Yan, 2022). This mixture of material, which is interleaved, promotes long-term memory (Sana & Yan, 2022).

## **Retrieval Practice in the Classroom**

Many studies indicate that tests promote long-term retention of previously studied material (Rickard & Pan, 2018). Moreover, when researchers introduce multiple-choice questions and fill-in-the-gap tests (as opposed to short-answer tests), students of every age see positive results (Moreira et al., 2019). Plus, regardless of test format (whether it was free recall, cued recall, or recognition), Moreira et al. (2019) corroborated that retrieval practice improved long-term retention more than restudying the material did; and it was effective as a student learning aid despite the presence or absence of feedback to the student.

Though the benefits of retrieval practice are evident, questions remain about how to determine the frequency and timing of retrieval practice to optimize learning for students of varying levels and for disparate content areas (Agarwal et al., 2021). With so many experiments using content from science and psychology, Agarwal and colleagues (2021) indicated that further research was necessary to determine the value of retrieval practice on non-science content such as humanities, math, foreign language, and skills-based learning. Researchers are also trying to determine if format, such as short answer, free recall, or multiple choice, moderates the effects of retrieval practice; or if the frequency or timing of feedback (whether instant, delayed, or absent) has an impact (Agarwal et al., 2021). Lastly, the effectiveness of retrieval practice might be altered due to discrepancies among student populations, differences between research laboratories and real-world settings, and factors that establish whether retrieval practice results will influence student grades (Agarwal et al., 2021).

## **Retrieval Practice and College Students**

Schwieren et al. (2017), who did not distinguish testing from retrieval practice, claimed that numerous experimental studies indicated that test-taking improved student learning. In fact, the testing effect has a body of empirical results which indicates that taking tests during the process of learning promotes retrieval of the information from long-term memory at a later date (Schwieren et al., 2017). In this sense, the point of testing is not the assessment of learning but the process for learning (Schwieren et al., 2017).

According to Rickard and Pan (2018), retrieval practice strengthens the memory trace by extending coded knowledge and by initiating multiple retrieval pathways to that knowledge, which resides in long-term memory. Moreover, the quantity of retrieval practice positively correlates with the scope of the effect (Schwieren et al., 2017). Plus, testing effects are more substantial with tougher tests and after longer periods of time between the initial learning process and the actual testing (Rickard & Pan, 2018). Also, feedback can be useful for assessing cognition and metacognition retrieval errors that might have influenced the student's test result (Rickard & Pan, 2018).

With this background in mind, Schwieren et al. (2017) analyzed 19 studies, ranging from 1984 to 2016, that incorporated the testing effect (or retrieval practice) for the teaching and learning of psychology content in the classroom. The researchers discerned that using testing (or retrieval practice) in the interim between initial learning and the final test improved tests results (Schwieren et al., 2017). So did offering feedback (Schwieren et al., 2017). Consequently, Schwieren and colleagues (2017) recommended the incorporation of retrieval practice to assess, evaluate, and enhance learning. However,

students should know beforehand whether a test will be used to judge performance or measure retrieval practice (Schwieren et al., 2017). Among the limitations of their work, the researchers cautioned that 19 studies might not have been sufficient to promote empirical conclusions and suggested that future research identify the conditions under which retrieval practice augments learning of psychology content (Schwieren et al., 2017).

### **Related Research Studies**

The topic of reading motivation continues to warrant inquiry. For example, one study incorporated a two-stage decision model to gauge time allocation related to intrinsic motivation (reading for leisure) and extrinsic motivation (reading for a job or educational purpose) (Suárez-Fernández & Boto-García, 2019). The researchers coordinated a sample of 15,154 Spaniards, who completed a survey of cultural habits and practices (Suárez-Fernández & Boto-García, 2019). Results indicated that extrinsically motivated reading substituted for intrinsically motivated reading, as opposed to supplementing it (Suárez-Fernández & Boto-García, 2019). So, reading for educational or career purposes supplanted leisure-time reading (Suárez-Fernández & Boto-García, 2019). Martin-Chang et al. (2021) explored how undergraduates could increase their verbal abilities more by reading fiction as opposed to nonfiction as they acted on intrinsic reading motivation. Moroi (2017) examined the reading behavior of female undergraduates and discovered that achievement motivations juxtaposed consumption motivations. Furthermore, metacognitive reading strategies, which influenced the effectiveness of reading and learning processes, were positively correlated to reading motivation (Baba Öztürk & Aydogmus, 2021).

Related research studies are expanding the understanding of retrieval practice, as well. For instance, Kenney and Bailey (2021) discovered that retrieval practice, in the form of daily reviews of content from a cognitive psychology course, helped students increase memory and reduce overconfidence. More specifically, while practicing retrieval of material from lectures, college students were more effective at correctly evaluating their level of knowledge and retaining material throughout the semester compared to when they did not use retrieval practice (Kenney & Bailey, 2021). Furthermore, Yeo and Fazio (2019) gauged learning goals and cognitive processes to assess the efficacy of retrieval practice in comparison to worked examples. The researchers determined that retrieval practice was more effective than repeated studying of the worked examples when long-term retention was needed for learning identical problem types; but retrieval practice was only equally effective compared to repeated studying of the worked examples when learning problems were nonidentical (Yeo & Fazio, 2019).

Palmer et al. (2019) noted that, for doctoral students, retrieval practice was more efficient and cost-effective for long-term learning expectations compared to the rewatching of class recordings. In fact, these pharmacy students achieved better long-term retention of content by engaging in retrieval practice, in the form of quizzes, compared to restudying recorded lectures. Lastly, Lawson (2022) found that retrieval practice, in the form of quizzes spaced over time, augmented undergraduates' retention of information and exam achievement while requiring minimal class time and subduing test anxiety among students.

## **Summary**

This chapter started with a recap of the problem of the decline in undergraduates' reading motivation and the importance of using retrieval practice to gain advantages for learning. After a restatement of the research questions and a justification for the review of the literature, the methodology was explained, along with the theoretical framework. In this case, Bruner's (1961) cognitive constructivist theory and Ryan and Deci's (2020) self-determination theory provided the framework for a comprehensive literature review of reading motivation and retrieval practice. The chapter concluded with related research studies.



### **CHAPTER 3: METHODOLOGY**

Reading motivation improves reading skills, academic achievement, career opportunities, and life experiences (Castillo, 2020). However, many students experience faltering reading motivation as they progress through school and fail to value reading over other activities (Levine et al., 2022). Moreover, they are unaware of the value or effectiveness of retrieval practice and how it augments long-term retention of information, improves memorization and understanding, and enhances metacognition (Agarwal et al., 2020). Regardless of a student's level of reading motivation, retrieval practice provides a way to bolster academic accomplishments (Agarwal et al., 2020). By coordinating reading motivation and retrieval practice, a student can work toward raising academic benchmarks and maximizing educational opportunities.

The significance of this study was that it provided missing information in the literature regarding the reading motivation and retrieval practice of undergraduates (Huang & Reynolds, 2022). More specifically, it delineated findings related to diverse groups. Plus, it stood to catalyze conversations about strategies that could be implemented to narrow achievement gaps, support social justice, and ignite pedagogy and curriculum changes.

This study was borne out of personal interest and developed to augment and generalize knowledge about specific phenomena (Merriam & Tisdell, 2016). However, the hope was that the knowledge gained would have implications for practice, would be

applicable for diverse groups and settings, and would form a basis for future applied research (Wallen & Frankel, 2001). The research questions were as follows:

1. What is the reading motivation of U. S. undergraduates aged 18 to 23?
2. What is the retrieval practice ability of U. S. undergraduates aged 18 to 23?
3. For U. S. undergraduates aged 18 to 23, how does reading motivation correlate with retrieval practice ability, particularly for different groups (e.g., based on gender, year as an undergraduate, and race/ethnicity)?

### **Research Design**

This study was designed as a convergent, parallel, mixed methods research project because a mixed methods approach combines quantitative and qualitative research into a unified study (Efron & Ravid, 2020). The convergence of approaches into a mixed methods study provided a comprehensive purview that contributed more data than either quantitative or qualitative efforts alone (Creswell, 2015). In fact, mixed methods research helps triangulate data and extend understanding (Walliman, 2018). Furthermore, this methodology derived from the research questions being asked and the strategies being used to collect and analyze the data (Efron & Ravid, 2020). In this case, a parallel approach was utilized, in which quantitative and qualitative data were collected sequentially but at approximately the same time. Since the research problem directed the study, the focus was to increase understanding that might lead to encompassing school solutions (Efron & Ravid, 2020).

An online survey functioned as the data collection tool to support a research method that was both “practical and doable” (Efron & Ravid, 2020, p. 57). Within the online survey, this two-phase research followed the sequence of a quantitative method

(the Adult Motivation for Reading Scale (Schutte & Malouff, 2007a)), and then a qualitative method (three reading passages which assessed retrieval practice). In addition, a third step, requiring an evaluation of how reading motivation and retrieval practice might abut, oppose, or conjoin, was performed by the researcher to add a deeper layer of understanding to the study.

### **Constructivist Worldview**

This research study was established within the philosophical *worldview* of constructivism. A worldview is a foundation of beliefs that dictates the action taken by the researcher, and it can be named *paradigms* (Efron & Ravid, 2020), *epistemologies* (Crotty, 1998), or *research methodologies* (Neuman, 2014), according to the researcher's preference (Creswell, 2014). Neuman (2014) called a paradigm "A general organizing framework for theory and research that includes basic assumptions, key issues, models of quality research, and methods for seeking answers" (p. 96).

The constructivist worldview orienting this research recognized that people have subjective interpretations of their experiences, thereby creating a multitude of understandings (Chilisa, 2020). In addition, as part of a community of learners, individuals incorporate social and historical interactions as they build knowledge (Creswell, 2014). The conglomeration of their lived experiences therefore contributes to the construction of their education.

### **Purpose of the Quantitative Component**

The mixed methods approach incorporated a quantitative component, the Adult Motivation for Reading Scale (Schutte & Malouff, 2007a), which was instrumental in addressing gaps in the literature related to the reading motivation of undergraduates

(Huang & Reynolds, 2022; Kambara et al., 2021). The intent was to identify how “occurrences of phenomena” could be described and to evaluate the interrelationship of those phenomena (Efron & Ravid, 2020, p. 48). The purpose of this quantitative element of the study was to gain insight that might lead to improved academic success for all students (Efron & Ravid, 2020).

### **Purpose of the Qualitative Component**

The constructivist nature of school experiences means that each student has a subjective interpretation that involves personal norms, beliefs, behaviors, and expectations (Efron & Ravid, 2020). In this research study, students were asked to read three passages and write or type all the facts they could recall. This narrative method meant that students used their own words to offer reflections on which information seemed most important, valuable, or useful (Efron & Ravid, 2020). Individual perspectives, beliefs, and experiences elucidated their educational experiences with these three reading passages.

### **Sampling Plan**

The target population for this research study was any U. S. undergraduate aged 18 to 23 who was pursuing a bachelor’s degree at a college or university or an associate’s degree at a college or vocational/technical school. The sampling frame recognized a target population of 16,215,756 students as of fall 2020, according to the National Center for Education Statistics (*Fast facts*, 2022). Later data were unavailable due to the COVID-19 pandemic.

The margin of error, also known as a confidence interval, which indicates the amount of random sampling error contained in survey results, was set at a reasonable

10% (*Margin of error*, 2022). The rationale was that a smaller margin of error provides greater confidence that the survey results are representing the population's views compared to a larger margin of error (*Margin of error*, 2022). In addition, a confidence level measures the certainty to which the sample represents the population, within the designated margin of error (*Margin of error*, 2022); and it was set at a rigorous 95% for this study. Furthermore, several prominent market research firms provided calculators to determine realistic and relevant sample sizes based on given population parameters (*Determining sample*, 2022; *Sample size calculator*, 2022). Ultimately, the researcher used the market research platform Pollfish, which indicated that a sample size of 97 would achieve a 95% confidence level with a 10% margin of error (*Margin of error*, 2022).

Within Pollfish's online market platform, the researcher created and distributed an online survey to the target population of U. S. undergraduates aged 18 to 23 within Pollfish's database of 670 million consumers across the globe (*How to find*, 2022). This random sampling approach resulted in the data collection of 90 national participants in mid-April 2022. Additional data collection took place in October 2022 and consisted of a cluster sample of 17 minority students from two urban universities in the northeastern United States.

For the national sample, Pollfish followed its own methodology with the use of Random Device Engagement, in which the survey got delivered inside mobile apps that participants were already using (*How the Pollfish*, 2021). Non-monetary incentives encouraged individual participation; and fraud prevention measures such as artificial intelligence and machine learning extracted biased responders and other "cheaters,

speeders, and bots,” thereby upgrading data quality (*How the Pollfish*, 2021). Plus, a software development kit allowed Pollfish to monitor users across devices, collect demographic data, and randomly target the desired population in a seamless manner (*How the Pollfish*, 2021). For the minority sample, participants received an email link to complete the online survey.

### **Researcher Role**

Because this study required mixed methods research, it demanded both objectivity and subjectivity as the strengths of both quantitative and qualitative processes were used in complementary fashion (Efron & Ravid, 2020). However, even with the researcher’s absence of direct contact with survey participants, researcher bias always exists to some extent, especially since knowledge and interest are processed by the researcher and remain intertwined (Herr & Anderson, 2015). Consequently, the researcher tried to remain objective and neutral where appropriate while still recognizing that personal values about the topics under study left an imprint of perceptions and interpretations on the research (Efron & Ravid, 2020).

The reading motivation component of the survey, which required a quantitative process, involved numerical descriptions of the groups and phenomena of reading motivation (Efron & Ravid, 2020). For the retrieval practice part of the survey, which required a qualitative process, the researcher tried to reveal the subjective experiences of participants to create a comprehensive understanding of the data, which were sorted into “categories, trends, and patterns” (Efron & Ravid, 2020, p. 46). Throughout the process, researcher interest remained emancipatory in the sense that the study was poised to unearth the human potential that lies in the cradle of ideology and school environment

(Herr & Anderson, 2015). The intent was that results of this study might open a window of self-reflection for students to transform their learning.

### **Data Collection Methods and Research Procedure**

The data collection tools for this mixed methods study encompassed a single online survey to investigate the three research questions. Survey questions were structured (or closed-ended), meaning that answer choices were fixed (Mertler, 2017); and unstructured, meaning that answers were open-ended (Efron & Ravid, 2020). Within the online survey, the Adult Motivation for Reading Scale (Schutte & Malouff, 2007b) produced quantitative data from the structured responses, which had a 5-point Likert scale rating responses from *strongly disagree* to *strongly agree*. The three reading passages were used to create qualitative data, which accumulated participants' unstructured responses of multiple written sentences related to retrieval practice. Overall, the online survey allowed for the triangulation of information, which not only extended what was known individually about reading motivation and retrieval practice but corroborated findings and revealed correlations between the variables (Efron & Ravid, 2020).

Surveys are useful for garnering information that enables practitioners, researchers, and other stakeholders to make warranted decisions (Efron & Ravid, 2020). Plus, using the Internet to conduct surveys has become more commonplace as people gain proficiency with the process and the survey experience (Efron & Ravid, 2020). Therefore, this online survey functioned as the operationalization, or the conduit by which the conceptual definitions of the constructs were measured empirically (Neuman, 2014). Moreover, the construction of this 31-question survey derived from the literature

review, the research questions, access to the target population, and a timetable for the completion of the study (Efron & Ravid, 2020). Sample requirements were identified, and pretesting was conducted. Then the online survey was constructed to answer specific research questions, to identify demographic information, to collect data, and to code responses (Efron & Ravid, 2020). Plus, survey items were numbered and ordered according to content, survey length was predetermined, and surveys were uniquely identified upon completion to facilitate transcription and analysis (Efron & Ravid, 2020).

### **Pretesting the Survey**

A convenience sample offers quick accessibility to a target population (Neuman, 2014). So, for the purposes of pretesting the online survey, the researcher used a convenience sample of four undergraduates, students who fit the target audience but would not be included in the findings. Conducting a preliminary tryout of the survey allowed the researcher to note confusion, problems, or concerns experienced by the handful of participants (Bandalos, 2018). In particular, the pretest gave the researcher feedback about the clarity of the questions and answer choices, the reading passages used to measure retrieval practice, and the time requirements to complete the survey with legitimate effort.

### **Elements of the Online Survey**

#### ***Reading Motivation – Measured with the Adult Motivation for Reading Scale (Schutte & Malouff, 2007b)***

Though the Adult Motivation for Reading Scale (Schutte & Malouff, 2007a) is one of the few scales designed for adults aged 18 to 77 and is easy to administer, an evaluation of its value as a measurement tool was necessary (Davis et al., 2018). To start,



Schutte and Malouff (2007a) conducted their research to identify the dimensions of adult reading motivation for the purpose of improving adult literacy programs and helping adult readers. With Ryan and Deci's (2000) self-determination theory as the basis for their research, they considered that measurement tools associated with children's reading motivation might need adjustments to better reflect changes in cognition, self-perceptions, and life experiences as people matured and encountered changing environmental settings (Schutte & Malouff, 2007a).

Schutte and Malouff (2007a) began with 220 individuals from New South Wales, Australia. Of the 136 women, 80 men, and 4 who did not identify their gender, the mean age was 28.62, and the participants ranged from 18 to 77 years old (Schutte & Malouff, 2007a). The discrepancy between women and men was not explained, but the unequal mix could have affected the applicability of results. Also, 74 participants came from community settings and 146 participants were undergraduate students of traditional and mature age (Schutte & Malouff, 2007a).

Schutte and Malouff (2007a) gauged overall reading motivation, along with four dimensions (or factors): Reading as Part of Self, Reading Efficacy, Reading for Recognition, and Reading to Do Well in Other Realms (Schutte & Malouff, 2007b). The researchers sought to align their four dimensions along a continuum, with intrinsic regulators on one end and extrinsic regulators on the other (Ryan & Deci, 2000b). Schutte and Malouff (2007a) considered Reading as Part of Self and Reading Efficacy as intrinsic factors of self-determination. On the other hand, Reading to Do Well in Other Realms was seen as a tool that required self-determination but with a view toward some non-reading goal, and it was considered a dimension that fell midway on the continuum

but within the band of extrinsic motivation (Schutte & Malouff, 2007a). In contrast, Reading for Recognition fell at the end of the extrinsic motivation continuum (Schutte & Malouff, 2007a). Regarding internal consistency, a Cronbach's alpha over 0.80 is considered a strong indicator of an instrument's soundness (Bandalos, 2018); and Schutte and Malouff's (2007a) Scale produced a Cronbach's alpha of 0.85. Plus, each of the four factors posted an acceptable alpha value ranging from 0.70 to 0.87 (Davis et al., 2018).

The final version of the Adult Motivation for Reading Scale, which accounted for the first 21 questions of this study's online survey, included 21 items and used a 5-point Likert scale with anchored points at 1-Strongly disagree, 2-Disagree, 3-Neither agree nor disagree, 4-Agree, and 5-Strongly agree (Schutte & Malouff, 2007b) (see Table 3.1). By labeling each scale point, the meaning of the numbers becomes clear to the respondent, thereby contributing to increased accuracy (Bandalos, 2018). Also, respondents tend to prefer labeled scale points, and bias increases when only certain scale points have labels (Bandalos, 2018). Furthermore, the use of five scale points produces a reasonable amount of variability among the responses while maintaining the reliability or consistency of the scale (Bandalos, 2018). Plus, the use of a neutral option captures an actual neutral reaction or situation of little personal opinion (Bandalos, 2018).

**Table 3.1** *Schutte and Malouff's (2007b) Adult Motivation for Reading Scale*

Question

- Q1 If a book or article is interesting, I don't care how hard it is to read.  
Q2 Without reading, my life would not be the same.  
Q3 My friends sometimes are surprised at how much I read.
- Q4 My friends and I like to exchange books or articles we particularly enjoy.  
Q5 It is very important to me to spend time reading.  
Q6 In comparison to other activities, reading is important to me.
- Q7 If I am going to need information from material I read, I finish the reading well in advance of when I must know the material.  
Q8 Work performance or university grades are an indicator of the effectiveness of my reading.  
Q9 I set a good model for others through reading.
- Q10 I read rapidly.  
Q11 Reading helps make my life meaningful.  
Q12 It is important to me to get compliments for the knowledge I gather from reading.
- Q13 I like others to question me on what I read so that I can show my knowledge.  
Q14 I don't like reading technical material.  
Q15 It is important to me to have others remark on how much I read.
- Q16 I like hard, challenging books or articles.  
Q17 I don't like reading material with difficult vocabulary.  
Q18 I do all the expected reading for work or university courses.
- Q19 I am confident I can understand difficult books or articles.  
Q20 I am a good reader.  
Q21 I read to improve my work or university performance.

*Note.* Reading motivation scale ratings: 1-*Strongly disagree*, 2-*Disagree*, 3-*Neither agree nor disagree*, 4-*Agree*, 5-*Strongly agree*.

***Retrieval Practice – Measured with Three Reading Passages***

Questions 22 through 24 required students to read three passages and provide open-ended responses of all the information they could recall about each passage. The prompt for reading passage A was as follows, with similar prompts for passages B and C:

Q22 Carefully **read** Passage A. Take as long as you wish. When you are ready, proceed to the next screen and **write** everything you recall from the passage. (Typing qualifies as writing in this case). Once you leave this page, you will not be able to return to it.

The reading passages, designed to measure undergraduates' retrieval practice skills, were excerpted from texts on OpenStax (Rice University). The passages were comprised of a psychology text with an excerpt on cells of the nervous system; a business text providing an introduction to intellectual property, with an excerpt of the basics of copyright; and a U. S. history text with an excerpt of Dutch colonial ambitions. All three passages were of similar length, with approximately 380 words each, and had no pictures, graphs, or tables. However, the content required distinct conceptual interpretations. The psychology passage contained much specialized vocabulary and covered information that most undergraduates were not likely to have studied, while the passage on intellectual property and the basics of copyright used standard English vocabulary to explain a topic that might not have been common knowledge to most undergraduates. Lastly, the U. S. history passage discussed a topic that most American students would have reviewed at some point in their education.

Questions 25 and 26 asked if students had read the passages themselves and had written their responses. The prompts were as follows:

Q25 Did you **read** the three passages?

Q26 Did you **write** your responses to the three passages?

These questions identified if survey respondents had used audio functions or voice-activated methods to respond, and the answer choices included an *other* option so that participants could specify any particulars. The researcher was trying to ensure that the same skills were being tested across all participants. Students vary in their abilities related to visual, aural, and oral learning, so comparing one student who spoke answers against another student who typed responses would not be a measure of the same construct. Responses would no longer compare like with like, and the retrieval practice

questions would not be measuring what they were intended to measure. Moreover, because Bruner's (1961) cognitive constructivist theory was a major framework of this study, the goal was to track the way students learn and maximize their capabilities. Since people encode memory and construct knowledge in unique ways, the questions related to retrieval practice needed to exhibit content validity, in which the content of the answers might be impacted by the cognitive processes involved (Bandalos, 2018).

### *Demographic Questions*

Questions 27 through 30 were demographic inquiries, which were useful in the description of the sample and the analysis of data. The prompts were as follows:

Q27 What degree are you pursuing?

Q28 In what year are you as an undergraduate?

Q29 What is your major or area of concentration at school?

Q30 In which U. S. state or other location/country do you presently reside?

These questions appeared at the end of the survey because they might have been perceived as objectionable, and participants were more likely to answer such questions after they had completed the survey and had become accustomed to providing responses (Bandalos, 2018; Efron & Ravid, 2020). The demographic questions included structured questions, with the occasional *other* answer choice so that participants could answer accurately, as well as write-in responses (Efron & Ravid, 2020). The questions asked the degree pursued, the year as an undergraduate (freshman, sophomore, junior, senior), major or area of concentration, and state of permanent residence. Questions related to age, race/ethnicity, and gender did not have to be asked as part of the survey because Pollfish, the survey administrator, already had that information about participants.

Question 31 was an open-ended query for any comments that participants might

have wanted to add. This question allowed a participant to share relevant information or offer additional feedback. The survey concluded with a message of thanks to participants.

### **Ethical Considerations**

When choosing to use Schutte and Malouff's (2007b) Adult Motivation for Reading Scale, the researcher first gained permission from Taylor and Francis Group, the original publisher of the article in which the Scale appeared (see Appendix A). Next, the researcher obtained Institutional Review Board approval and established ethical guidelines for participants (see Appendix B) (Efron & Ravid, 2020). Participant comfort and safety were considered, risks were essentially nonexistent, participants could withdraw at any time with no ramifications, and potential benefits included the emotional gain a respondent might experience from aiding in a research study designed to advance knowledge about undergraduates' reading motivation and retrieval practice. Furthermore, the online survey was anonymous for participants and was expected to take 17 minutes. The survey is included as Appendix C.

### **Data Analysis Strategies**

Data for the national sample were collected in mid-April 2022, and data for the minority sample were collected in October 2022. Analysis was performed with Microsoft Excel and occurred in three parts. First, data from the Adult Motivation for Reading Scale (Schutte & Malouff, 2007b) were analyzed with deductive strategies and descriptive statistics. Second, retrieval practice relied on deductive strategies to organize information into categories and to apply theoretical frameworks (Bingham & Witkowsky, 2022). In addition, inductive strategies were employed to derive meaning from the data, to identify themes, and to explain the findings in relation to theory (Bingham & Witkowsky, 2022).

These strategies provided relevant descriptive statistics. Third, inductive analysis and inferential statistics revealed correlations between reading motivation and retrieval practice. Table 3.2 recaps the analysis methods used.

**Table 3.2** *Data Source and Analysis Methods by Research Question*

	Research question	Data source	Analysis methods
1	What is the reading motivation of U. S. undergraduates aged 18 to 23?	online survey	deductive analysis, descriptive statistics
2	What is the retrieval practice ability of U. S. undergraduates aged 18 to 23?	online survey	deductive analysis, inductive analysis, descriptive statistics
3	For U. S. undergraduates aged 18 to 23, how does reading motivation correlate with retrieval practice ability, particularly for different groups (e.g., based on gender, year as an undergraduate, and race/ethnicity)?	online survey	inductive analysis, inferential statistics

### **Methods of Data Analysis**

Mixed methods research benefits from the triangulation of data, in which quantitative and qualitative data share equal value in the analysis (Efron & Ravid, 2020). It offers a convergence toward complementarity, in which each method enhances the integrity of the research, thereby resulting in augmented credibility (Schoonenboom & Johnson, 2017). For this research study, the data for reading motivation and retrieval practice were collected from the same online survey but were assessed separately before being integrated for a more in-depth interpretation (Bazeley, 2018). Moreover, analysis provided insights into the third research question, which inquired about correlations between reading motivation and retrieval practice.

The quantitative research strategy, which stemmed from questions 1 through 21 of the online survey (the Adult Motivation for Reading Scale (Schutte & Malouff, 2007b)) and addressed the first research question, required the incorporation of

descriptive statistics. Frequency analysis, as well as measures of central tendency, variability/spread, and association were utilized. The qualitative research strategy, which evolved from questions 22 through 24 of the online survey (the three retrieval practice questions) and addressed the second research question, followed a process of first cycle coding and second cycle coding. Coding functions as a heuristic in that it is a technique without formula, used to solve problems and explore parameters (Saldaña, 2009). Coding also reflects the “constructivist dimension of research,” which mimics the constructivist nature of learning that is explored in the theoretical framework of this dissertation through Bruner’s (1961) cognitive constructivist theory (Hedlund-de Witt, 2013, p. 2).

The first cycle coding was deductive and encompassed descriptive coding and in vivo coding (which used participants’ own words). Codes were developed for the sake of categorization to align with the second research question, which dealt with undergraduates’ retrieval practice ability. From the outset, categories were reflective of the research purpose, exhaustive, and mutually exclusive (Merriam & Tisdell, 2016). The second cycle coding was inductive and started with open coding (also called initial coding). Codes captured the researcher’s first impressions, words and phrases, the essences of ideas, or verbatim reactions of participants (Hedlund-de Witt, 2013). Open codes were then grouped, in an act known as axial coding (Strauss, 2015); or analytical coding, which transcends description and incorporates interpretation and reflection (Richards, 2015); or pattern coding (Bingham & Witkowsky, 2022). The second cycle coding utilized more advanced strategies to assess and organize data into themes and concepts (Saldaña, 2009). In fact, by discerning patterns, themes became more emergent (Bingham & Witkowsky, 2022). Moreover, the themes transcended basic coding and



required the abstraction of elemental thoughts, reflection, and analytic contemplation (Hedlund-de Witt, 2013).

Throughout the coding efforts, the researcher employed analytic memo writing to reflect on the coding process; to capture descriptions and evidence of participants' responses; and to gauge decisions made in association with the discovery of categories, patterns, and themes (Bingham & Witkowsky, 2022; Merriam & Tisdell, 2016). Overall, the coding process enabled the researcher to make sense of the findings as they related to theory and current literature (Bingham & Witkowsky, 2022). It also illuminated possible actionable steps for educators and contributed to the understanding of implications and recommendations for the research study as a whole (Bingham & Witkowsky, 2022). In fact, the sharing of these insights, whether through researcher presentations or professional conferences, might ignite other educators to create better instruction for students.

The last method of data analysis employed inductive analysis to decipher the third research question. It relied on the intersection and amalgamation of data related to reading motivation and retrieval practice. Inferential statistics, including covariance and correlation analyses, as well as tests of significance, revealed connections between the two variables.

### **Quality Criteria**

Quality criteria test the strength of the research and its methodologies (Herr & Anderson, 2015). Meeting criteria standards elevates the usefulness of the research in tackling the problem of practice and shaping action plans for better student instruction

(Efron & Ravid, 2020). For this study, the researcher assessed validity, trustworthiness, and reliability.

### ***Validity***

The predominant justification of this dissertation was to provide new knowledge (Herr & Anderson, 2015); and the term *validity* referred “to the degree to which the study, the data collection tools, and the interpretation of data” correctly represented the matter being examined (Efron & Ravid, 2020, p. 76). Moreover, mixed methods research required specific applications of validity when considering the quantitative versus qualitative components of the research (Efron & Ravid, 2020). In this case, the quantitative element of the online survey demonstrated validity with the “appropriateness of the tools used to collect data” and “the soundness of the study’s design” (Efron & Ravid, 2020, p. 76).

### ***Trustworthiness***

The qualitative aspect of the online survey, which focused on the retrieval practice ability of undergraduates, involved a more subjective approach, thereby making the acquisition of information and the way it was obtained an issue of *trustworthiness*. Therefore, the researcher recognized preconceptions and ideas in order to inhibit personal biases (Efron & Ravid, 2020;). Such self-reflection was imperative to the establishment of trustworthiness, and coding practices reflected these principles (Efron & Ravid, 2020).

### ***Reliability***

*Reliability* ensured that discrepancies in findings were not the result of vagaries stemming from the measurement instrument (Neuman, 2014). It demanded that the research effort be dependable and consistent, with the expectation that it could be

replicated (Cohen et al., 2018). The researcher met these conditions by retaining well-defined and conceptualized constructs (Cohen et al., 2018). Furthermore, survey questions followed the principles of good measurement: They gauged mutually exclusive attributes, meaning that each answer fit into a single category; they exhausted each attribute, meaning that every answer fit into a category; and they demonstrated unidimensionality, meaning that each measure linked to a single construct (Neuman, 2014).

### **Limitations**

Along with constraints related to time, access to the desired population, and money, other limitations were considered. For instance, results derived from the use of Schutte and Malouff's (2007a) Adult Motivation for Reading Scale might have been ill-suited for non-Australian cultures or subcultures. Also, questions remained as to whether the Scale had a sufficient number of items to accurately measure each of the four factors of reading motivation (Kambara et al., 2021). Regarding Pollfish, the market research platform that distributed the online survey, the researcher was unable to determine if any pertinent discrepancies existed between Pollfish's audience of undergraduates and the actual target population (accessible and not accessible by Pollfish) as it existed in the United States.

Another limitation was whether survey respondents answered questions honestly (Efron & Ravid, 2020). Surveys involve self-reports, which might produce incorrect or sanitized information so that respondents can appear in a desired way (Efron & Ravid, 2020). In truth, responses might have echoed expected beliefs instead of actual attitudes,

beliefs, or opinions. This social desirability bias, in which participants contrive answers to fit social norms, is pervasive (Neuman, 2014).

Finally, because participants used less time than pretesting indicated was necessary, they might not have demonstrated their best abilities when answering the three questions related to retrieval practice. Whereas some survey questions required checking a box or writing a few words, retrieval practice questions were more labor and time intensive. Participants were asked to provide comprehensive answers equivalent to a testing situation. However, nothing was at stake if undergraduates did poorly on the retrieval practice, so results might not have reflected students' skills.

### **Summary**

This chapter provided an overview of the problem related to undergraduates' reading motivation and retrieval practice, as well as the far-reaching significance of the research study. A restatement of the three research questions led to an examination of the research design for this convergent, parallel, mixed methods research project; and a description of the study's constructivist worldview was included. Next, the sampling plan explained the process of accessing a suitable sample, and the researcher's role was described. The data collection tools and the research procedure were scrutinized. Plus, data analysis strategies appropriate to both quantitative and qualitative components of the methodology were explained. Lastly, quality criteria and limitations were identified.

## CHAPTER 4: RESULTS AND FINDINGS

Reading motivation provides a path toward academic skills, educational achievement, and career options (Levine et al., 2022). However, numerous students exhibit declining reading motivation as they advance in their education and devalue reading over other activities (Levine et al., 2022). Furthermore, they are unaware of the efficacy of retrieval practice and how it aids memory, recall of facts, and overall metacognition (Agarwal et al., 2020). By gauging reading motivation and retrieval practice, a student can reduce achievement gaps and augment educational opportunities. This study was significant because it supplied information on undergraduates' reading motivation and retrieval practice, thereby filling a void in the literature (Huang & Reynolds, 2022; Kambara et al., 2021).

Data from a national sample ( $n = 90$ ) were collected in mid-April 2022, and data from a minority sample ( $n = 17$ ) were collected in October 2022. A single online survey provided quantitative data on reading motivation and qualitative data on retrieval practice. The data were collected to answer the following three research questions: (1) What is the reading motivation of U. S. undergraduates aged 18 to 23?; (2) What is the retrieval practice ability of U. S. undergraduates aged 18 to 23?; (3) For U. S. undergraduates aged 18 to 23, how does reading motivation correlate with retrieval practice ability, particularly for different groups (e.g., based on gender, year as an undergraduate, and race/ethnicity)?

## Overview of National Sample

Table 4.1 provides the demographics of the 90-student national sample used to examine the three research questions. The sample was 43% males and 57% females, with 78% of students attending a university and working toward a bachelor's degree.

Regarding age, 70% of the students ranged from 20 to 22 years old, with the mode being 21 years old. Plus, the sample contained four races/ethnicities: 10.0% Asian, 22.2% Black, 13.3% Hispanic, and 54.4% White.

**Table 4.1** *Overview of 90-Student National Sample*

Gender	Quantity	Education/School type	Quantity
Male	39	University	70
Female	51	Vocational/Technical college	20
total	90	total	90

  

Degree sought	Quantity	Year as undergraduate	Quantity
Associate's	14	Freshman	18
Bachelor's	70	Sophomore	20
Master's	3	Junior	23
Undetermined	3	Senior	29
total	90	total	90

  

Age	Quantity	Race/Ethnicity	Quantity
18	8	Asian	9
19	6	Black	20
20	15	Hispanic	12
21	31	White	49
22	17	total	90
23	13		
total	90		

### States Represented by National Sample

The sample represented undergraduates with 28 different states of permanent residence. The states, with a number in parentheses to indicate the number of students permanently residing in that particular state, were as follows: Arizona (3), Arkansas (1), California (13), Connecticut (1), Florida (6), Georgia (8), Idaho (1), Illinois (1), Indiana (1), Iowa (2), Kansas (1), Maryland (3), Massachusetts (1), Michigan (4), Minnesota (1), Nevada (1), New Jersey (4), New York (11), North Carolina (1), Ohio (4), Oklahoma (2),

Oregon (1), Pennsylvania (3), Tennessee (5), Texas (5), Utah (1), Virginia (2), Wisconsin (1), and undetermined (2). Most students hailed from California, New York, or Georgia.

### **Amount of Time to Take Survey**

An analysis of the time students took to complete the survey revealed that the mode was 5 minutes, the median was 7 minutes, the mean was 9.22 minutes, and 76% of participants took approximately 12 minutes or less to complete the survey. Pretesting indicated that 17 minutes was a realistic time to complete the survey, and in fact, only 12 out of 90 undergraduates spent at least 17 minutes answering the survey questions. This shortfall creates a limitation to the research study. Moreover, given the range of survey times and recall ability, motivation might have been tempered by reading fatigue in this low-stakes assessment (Borgonovi & Biecek, 2016).

Of the 12 students who spent 17 to 34 minutes to complete the survey, the 20-year-old male who took 34 minutes to complete the survey demonstrated the highest retrieval practice in each reading passage. He identified the maximum of 11 facts, 8 facts, and 13 facts from reading passages A, B, and C, respectively. This White student from New Jersey was a junior working toward a bachelor's degree at a university and was an engineering major. Furthermore, the student who demonstrated the second strongest retrieval practice overall was a male, junior, law major working toward a bachelor's degree at a university; considered Arizona his permanent residence; was White; and spent 27 minutes completing the survey.

## **National Sample – Research Question 1:**

### **What is the reading motivation of U. S. undergraduates aged 18 to 23?**

Quantitative data obtained from the Adult Motivation for Reading Scale (Schutte & Malouff, 2007b) allowed the researcher to gauge undergraduates' reading motivation overall and according to gender, year as an undergraduate, and race/ethnicity. Moreover, Schutte and Malouff (2007a) defined four specific factors, or dimensions, of reading motivation: Reading as Part of Self, Reading Efficacy, Reading to Do Well in Other Realms, and Reading for Recognition. These factors spanned the continuum for motivation and shed further insight on the variety and strength of intrinsic and extrinsic regulation that impacted students' reading motivation (Ryan & Deci, 2000b).

#### **National Sample: Overall Reading Motivation**

Table 4.2 measures the overall level of reading motivation for each of the 21 questions on the reading motivation scale. With a rating of 1 indicating the lowest reading motivation and a rating of 5 indicating the highest reading motivation, average ratings ranged from 2.60 to 4.38 for the 90-student sample. The overall mean rating ( $M = 3.65$ ,  $SD = 0.41$ ), indicated that the students were somewhat motivated readers.



**Table 4.2** *National Sample: Mean Rating of Reading Motivation Scale by Question and Overall*

<u>Question</u>	<u>Mean rating</u>
Q1 If a book or article is interesting, I don't care how hard it is to read.	3.84
Q2 Without reading, my life would not be the same.	3.70
Q3 My friends sometimes are surprised at how much I read.	3.53
Q4 My friends and I like to exchange books or articles we particularly enjoy.	3.44
Q5 It is very important to me to spend time reading.	3.91
Q6 In comparison to other activities, reading is important to me.	3.79
Q7 If I am going to need information from material I read, I finish the reading well in advance of when I must know the material.	3.79
Q8 Work performance or university grades are an indicator of the effectiveness of my reading.	3.78
Q9 I set a good model for others through reading.	3.83
Q10 I read rapidly.	3.69
Q11 Reading helps make my life meaningful.	3.92
Q12 It is important to me to get compliments for the knowledge I gather from reading.	3.17
Q13 I like others to question me on what I read so that I can show my knowledge.	3.59
Q14 I don't like reading technical material.	3.01
Q15 It is important to me to have others remark on how much I read.	2.96
Q16 I like hard, challenging books or articles.	3.68
Q17 I don't like reading material with difficult vocabulary.	2.60
Q18 I do all the expected reading for work or university courses.	3.89
Q19 I am confident I can understand difficult books or articles.	4.02
Q20 I am a good reader.	4.38
Q21 I read to improve my work or university performance.	4.07
<b>Mean rating of entire sample</b>	<b>3.65</b>

*Note.* Reading motivation scale ratings: 1-*Strongly disagree*, 2-*Disagree*, 3-*Neither agree nor disagree*, 4-*Agree*, 5-*Strongly agree*.

Table 4.3 explores the mean reading motivation rating for the national sample according to gender, year as an undergraduate, and race/ethnicity. Of the participants in this research study, results indicated that females were more motivated readers than males, and seniors posted the strongest reading motivation for their group. Lastly, of this study's participants, students who were Black (M = 3.75) or White (M = 3.69) seemed more motivated to read than Asian students (M = 3.25, median = 3.33). In fact, five Asian undergraduates from this participant pool fell one standard deviation below the national

sample mean of 3.65, while three others dropped two and even three standard deviations below the national sample mean.

**Table 4.3** *National Sample: Mean Rating of Reading Motivation Scale – By Gender, Year as Undergraduate, Race/Ethnicity*

Read motivation scale	Gender		Year as undergraduate			
	Male	Female	Freshman	Sophomore	Junior	Senior
Mean rating	3.60	3.65	3.62	3.62	3.65	3.68

  

Read motivation scale	Race/Ethnicity			
	Asian	Black	Hispanic	White
Mean rating	3.25	3.75	3.59	3.69

*Note.* Reading motivation scale ratings: 1-*Strongly disagree*, 2- *Disagree*, 3-*Neither agree nor disagree*, 4-*Agree*, 5-*Strongly agree*.

### **Results of the 4 Factors of Reading Motivation**

Schutte and Malouff (2007a) divided reading motivation into four factors, which fell along a continuum that ranged from intrinsic regulators to extrinsic regulators (Ryan & Deci, 2000b). This continuum, described in detail in Ryan and Deci’s (2000a) self-determination theory, was considered along with reading engagement theory to explain these four factors of reading motivation (Guthrie & Alvermann, 1999). Reading as Part of Self and Reading Efficacy were considered intrinsic factors of self-determination (Schutte & Malouff, 2007a). In contrast, Reading to Do Well in Other Realms was deemed a tool resulting from self-determination. This type of extrinsic motivation fell midway on the motivation spectrum and was enacted for the purpose of achieving a non-reading goal (Schutte & Malouff, 2007a). Lastly, Reading for Recognition was identified as an extrinsically motivated act (Schutte & Malouff, 2007a).

**Reading as Part of Self**

According to Table 4.4, Reading as Part of Self (M = 3.73, SD = 0.16) had similar motivating effects for males and females. For the category of year as an undergraduate, juniors indicated the highest rating and freshmen the lowest rating of the group. Moreover, study participants who were Black placed greater significance on Reading as Part of Self compared to study participants who were Asian, the group least impacted by this factor. To be specific, 7 out of 9 Asian undergraduates landed at least two or three standard deviations below the mean.

**Table 4.4** National Sample: Reading as Part of Self – Mean Rating Overall and by Gender, Year as Undergraduate, Race/Ethnicity

Mean rating overall 3.73

Reading as Part of Self	Gender		Year as undergraduate			
	Male	Female	Freshman	Sophomore	Junior	Senior
Mean rating	3.73	3.72	3.63	3.69	3.82	3.74

Reading as Part of Self	Race/Ethnicity			
	Asian	Black	Hispanic	White
Mean rating	3.35	3.93	3.55	3.76

*Note.* Reading as Part of Self was comprised of reading motivation scale questions 2, 3, 4, 5, 6, 9, 10, 11. Reading motivation scale ratings: 1-Strongly disagree, 2- Disagree, 3-Neither agree nor disagree, 4-Agree, 5-Strongly agree.

**Reading Efficacy**

As indicated in Table 4.5, Reading Efficacy (M = 3.59, SD = 0.61) had the same impact on males and females. Seniors were most motivated by reading efficacy; juniors were least motivated by this factor. Moreover, White students from the study were most

motivated by Reading Efficacy, whereas Asian undergraduates from the study were least motivated, with 8 out of 9 students falling at least one standard deviation below the mean.

**Table 4.5** *National Sample: Reading Efficacy – Mean Rating Overall and by Gender, Year as Undergraduate, Race/Ethnicity*

Mean rating overall 3.59

Reading Efficacy	Gender		Year as undergraduate			
	Male	Female	Freshman	Sophomore	Junior	Senior
Mean rating	3.59	3.59	3.54	3.59	3.47	3.71

Reading Efficacy	Race/Ethnicity			
	Asian	Black	Hispanic	White
Mean rating	3.13	3.54	3.64	3.68

*Note.* Reading Efficacy was comprised of reading motivation scale questions 1, 14, 16, 17, 19, 20.

Reading motivation scale ratings: 1-*Strongly disagree*, 2- *Disagree*, 3-*Neither agree nor disagree*, 4-*Agree*, 5-*Strongly agree*.

***Reading to Do Well in Other Realms***

Table 4.6 shows that Reading to Do Well in Other Realms (M = 3.88, SD = 0.12) was the most motivating of the four factors. Moreover, of the students participating in this study, males were more motivated by this factor than females. Regarding race/ethnicity, Black student participants placed the greatest importance on Reading to Do Well in Other Realms; Hispanic student participants from this study placed the least value on this factor.

**Table 4.6** National Sample: Reading to Do Well in Other Realms – Mean Rating Overall and by Gender, Year as Undergraduate, Race/Ethnicity

Mean rating overall 3.88

Do Well in Other Realms	Gender		Year as undergraduate			
	Male	Female	Freshman	Sophomore	Junior	Senior
Mean rating	3.91	3.86	3.88	3.76	3.93	3.92

Do Well in Other Realms	Race/Ethnicity			
	Asian	Black	Hispanic	White
Mean rating	3.78	4.06	3.65	3.88

*Note.* Reading to Do Well in Other Realms was comprised of reading motivation scale questions 7, 8, 18, 21.

Reading motivation scale ratings: 1-*Strongly disagree*, 2- *Disagree*, 3-*Neither agree nor disagree*, 4-*Agree*, 5-*Strongly agree*.

### ***Reading for Recognition***

Reading for Recognition ( $M = 3.24$ ,  $SD = 0.26$ ) was the least motivating of the four factors. However, according to Table 4.7, of this study’s participants, females rated it higher than males did; and freshmen deemed Reading for Recognition more important than sophomores, juniors, or seniors, who were least interested. Plus, among the races/ethnicities, Hispanic undergraduate participants placed the greatest significance on Reading for Recognition, while 6 out of 9 Asian student participants revealed their indifference by ranking it at least three standard deviations below the mean.

**Table 4.7** National Sample: Reading for Recognition – Mean Rating Overall and by Gender, Year as Undergraduate, Race/Ethnicity

Mean rating overall 3.24

Reading for Recognition	Gender		Year as undergraduate			
	Male	Female	Freshman	Sophomore	Junior	Senior
Mean rating	3.13	3.32	3.41	3.33	3.19	3.10

Reading for Recognition	Race/Ethnicity			
	Asian	Black	Hispanic	White
Mean rating	2.52	3.25	3.50	3.30

*Note.* Reading for Recognition was comprised of reading motivation scale questions 12, 13, 15.

Reading motivation scale ratings: 1-*Strongly disagree*, 2- *Disagree*, 3-*Neither agree nor disagree*, 4-*Agree*, 5-*Strongly agree*.

In sum, Reading to Do Well in Other Realms was the most motivating of the four factors for all student groups. In contrast, Reading for Recognition was the least motivating factor for undergraduates. The means for Reading to Do Well in Other Realms ranged from 3.65 to 4.04, while the means for Reading for Recognition ranged from 2.52 to 3.50. So, Reading to Do Well in Other Realms was a successful extrinsic motivator that linked compliance and performance for the sake of achievement of an external goal, such as success in school or at a job (Schutte & Malouff, 2007a). In contrast, Reading for Recognition, which was not linked to reading enjoyment, frequency, or hours devoted to recreational or mandatory reading, but was instead associated with a wish to be recognized by others for reading-related activities, was not a successful extrinsic motivator for undergraduates (Schutte & Malouff, 2007a).

## **National Sample - Research Question 2:**

### **What is the retrieval practice ability of U. S. undergraduates aged 18 to 23?**

Retrieval practice was comprised of three reading passages, which had a coding system that was created in response to the students' answers to each passage (see Appendices D, E, F). Code 1 indicated that no information was recalled (comments were not relevant to the passage or incorrect details were provided), code 2 indicated retrieval of a few words or a phrase that correctly identified the topic, and each additional code indicated the retrieval of a discrete fact unique to the passage. Reading passage A was a psychology excerpt on the cells of the nervous system. It produced 21 codes across the 90-person national sample, and individual students ranged from retrieving 0 to 11 facts. Reading passage B was an introduction to intellectual property that focused on the basics of copyright. It produced 18 codes, with individual students recalling 0 to 8 facts. Reading passage C was a U. S. history excerpt that described Dutch colonial ambitions. It produced 23 codes, with individuals retrieving 0 to 13 facts.

Table 4.8 produces the number of facts retrieved by students for each reading passage. Many students failed to retrieve any information on the topic (comments were not relevant to the passage or incorrect details were provided), recalled only the topic, or retrieved only a single fact. For example, in reading passage A, 22 students failed to recall any correct information and 42 students produced only the topic or a single fact. That means that 71% of students demonstrated little to no retrieval practice. In reading passage B, 12 students recalled no relevant information and 40 students recalled a single detail. That amounts to 58% of undergraduates demonstrating limited or nonexistent retrieval practice. Finally, for reading passage C, 11 students produced no correct

information and 41 undergraduates retrieved the topic or a single fact. That equates to 58% of students demonstrating little to no retrieval practice for reading passage C. Given the fact that students may have experienced a lack of attention to these questions and spent less time than expected to complete the survey, these results were not wholly unexpected.

**Table 4.8** *National Sample: Number of Facts Retrieved by Students – By Reading Passage*

Reading Passage A		Reading Passage B		Reading Passage C	
Number of facts retrieved	Number of students	Number of facts retrieved	Number of students	Number of facts retrieved	Number of students
0	22	0	12	0	11
1	42	1	40	1	41
2	12	2	18	2	19
3	3	3	8	3	7
4	3	4	3	4	3
5	4	5	5	5	4
6	1	6	2	6	2
7	1	8	2	7	1
10	1			9	1
11	1			13	1

The aggregate of codes retrieved per student ranged from 3 to 32 codes, with a mean of 5.82, a median of 4, and a skew of 2.73. The data created a right tail that corroborated the diminishing number of students demonstrating retrieval practice at high levels. Plus, the kurtosis of 9.68 confirmed a peaked aggregate, with many students exhibiting low levels of retrieval practice.

Table 4.9 shows how the national sample fared with retrieval practice. Overall, females struggled more than males to retrieve information from the reading passages. Also, seniors performed best overall and sophomores performed worst in the category of year as an undergraduate. Plus, Hispanic (M = 3.50, median = 3, skew = 2.56) and Black (M = 5.15, median = 3, skew = 2.09) students struggled much more than their Asian (M =



5.89, median = 5, skew = 1.88) and White (M = 6.65, median = 4, skew = 2.43) counterparts to retrieve details from the reading passages.

Regarding the potential difficulty of each reading passage, the researcher deliberately organized the psychology excerpt to appear first due to its specialized vocabulary and the possibility that it might need the greatest focus from students. In contrast, the U. S. history excerpt appeared last, in case of waning attention spans among students as the survey progressed. This history topic was likely the most familiar of the three excerpts because it resembled content that many students would have learned in a basic history class at some point in their educations. Regardless, most students found reading passage A (psychology excerpt) to be the most challenging of the three passages. In contrast, seniors did best with passage A and were equally less successful with the other passages. The Asian undergraduates did equally well on passage A and passage C (U. S. history excerpt) and were most likely to have recalled nothing, only the topic, or a single piece of information for passage B (intellectual property and copyright excerpt).

**Table 4.9** National Sample – Retrieval Practice: Percentage of Students who Retrieved Nothing, the Topic, or a Single Fact – By Gender, Year as Undergraduate, Race/Ethnicity

Category	Number of students	Reading Passage A	Reading Passage B	Reading Passage C	Overall average
<b>Entire sample</b>	<b>90</b>	<b>53%</b>	<b>43%</b>	<b>43%</b>	<b>47%</b>
<b>Gender</b>					
Male	39	69%	56%	54%	60%
Female	51	73%	59%	61%	64%
<b>Year as undergrad</b>					
Freshman	18	72%	56%	56%	61%
Sophomore	20	80%	60%	60%	67% <b>W</b>
Junior	23	91% <b>W</b>	52% <b>B</b>	52% <b>B</b>	65%
Senior	29	48% <b>B</b>	62% <b>W</b>	62% <b>W</b>	57% <b>B</b>
<b>Race/Ethnicity</b>					
Asian	9	44% <b>B</b>	56%	44% <b>B</b>	48% <b>B</b>
Black	20	85%	70%	55%	70%
Hispanic	12	100% <b>W</b>	83% <b>W</b>	92% <b>W</b>	92% <b>W</b>
White	49	63%	47% <b>B</b>	53%	54%

*Note.* B – best demonstrated retrieval practice for that reading passage in that category (year as undergraduate or race/ethnicity).

W – worst demonstrated retrieval practice for that reading passage in that category (year as undergraduate or race/ethnicity).

### National Sample - Research Question 3:

**For U. S. undergraduates aged 18 to 23, how does reading motivation correlate with retrieval practice ability, particularly for different groups (e.g., based on gender, year as an undergraduate, and race/ethnicity)?**

Prior to establishing correlations between reading motivation and retrieval practice, the researcher benefited from synthesizing the results and findings. In this case, the component parts were summarized. From this point, a succinct overview of the analysis provided insights about the correlations between reading motivation and retrieval practice.

## **National Sample: Summary of Reading Motivation Results and Retrieval Practice Findings**

Undergraduates were somewhat motivated readers ( $M = 3.65$ ), and females professed greater reading motivation than males. Seniors were more motivated than others in the year as an undergraduate category, and Black students claimed much higher reading motivation than the least motivated undergraduates, the Asian students. Among the four factors of reading motivation, Reading for Recognition (an extrinsic regulator) was not a motivating reason to read for any of the undergraduates, but Reading to Do Well in Other Realms (also an extrinsic regulator) was highly compelling. In short, these students were self-determined, but they were motivated to read for the sake of accomplishing a non-reading goal (Schutte & Malouff, 2007a).

Analysis of retrieval practice showed that males demonstrated better retrieval practice than females; and the best to worst performers for year as an undergraduate were seniors, freshmen, juniors, and then sophomores. In addition, race/ethnicity illuminated the disparities in retrieval practice achievement. Students who were Asian (best performers) or White fared much better than students who were Hispanic (worst performers) or Black.

### **National Sample: Covariance Analysis**

Table 4.10 gives the results of covariance analysis, which indicated that overall, and according to gender, the two variables of reading motivation and retrieval practice did not covary by much. However, freshmen had a direct relationship and juniors had an inverse relationship with these variables. Plus, students who were Asian positively connected reading motivation and retrieval practice.

**Table 4.10** *National Sample: Covariance Analysis of Reading Motivation and Retrieval Practice*

	Covariance
<b>Entire sample</b>	<b>-0.72</b>
<b>Gender</b>	
Male	0.93
Female	-1.89
<b>Year as undergraduate</b>	
Freshman	5.11
Sophomore	2.09
Junior	-7.94
Senior	-0.66
<b>Race/Ethnicity</b>	
Asian	8.02
Black	-0.10
Hispanic	-2.67
White	-2.98

**National Sample: Correlations between Reading Motivation and Retrieval Practice**

Correlation analysis returned results ranging from -1 to +1 to identify the strength of negative and positive relationships, respectively, between reading motivation and retrieval practice; and tests of statistical significance reinforced conclusions. Overall, little correlation existed between the two variables ( $n = 90$ ,  $r = -0.01$ ); and gender showed low correlation, as well (males,  $r = 0.02$ ; females,  $r = -0.04$ ). However, results related to freshmen were statistically significant ( $r = 0.32$ ,  $p = 0.00$ ), as were the results for Asian ( $r = 0.33$ ,  $p = 0.00$ ) and Hispanic ( $r = -0.21$ ,  $p = 0.05$ ) students. Given that a p-value less than or equal to 0.05 is a commonly accepted threshold to indicate that the statistical evidence is not likely the result of chance, the likelihood of reading motivation and retrieval practice rising or falling in tandem for freshmen and Asian undergraduates was not a random occurrence (Moore et al., 2015). Additionally, for Hispanic undergraduates, the increase in reading motivation which correlated with a decline in retrieval practice, and vice versa, was more likely a probability than a chance incident.

## **Minority Sample Analysis**

The researcher wanted to assess the results of the nationwide data against a more localized group with a more diverse composition. In response, a cluster sample of 17 minority undergraduates from two urban universities in the northeastern U. S. was analyzed in October 2022 to corroborate the national results. These students, with a mean age of 21, took an average of 13.01 minutes to complete the survey, which was supplied to the participants through an email link. Moreover, this sample of 7 males and 10 females, all working toward bachelor's degrees, was comprised of 6 juniors and 11 seniors of the following races/ethnicities (with number of undergraduates in parentheses): Black (11); Hispanic (6). The students hailed from Delaware (2); New Jersey (4); New York (3); and Pennsylvania (8). Because of the small size of this non-random minority sample, any results related to the sample were deemed exploratory as opposed to indicative or evidential. Furthermore, any comparisons between the national sample and the minority sample were viewed with caution and were not construed as representative of the population of undergraduates.

### **Minority Sample: Reading Motivation – Research Question 1**

Table 4.11 highlights the minority sample's mean ratings of all 21 questions from the reading motivation scale. It shows that the minority sample posted average ratings ranging from 2.76 to 4.29 ( $M = 3.59$ ,  $SD = 0.36$ ). Compared to the national sample ( $M = 3.65$ ,  $SD = 0.41$ ), these minority students displayed a narrower range and somewhat lower mean.

**Table 4.11** *Minority Sample: Mean Rating of Reading Motivation Scale by Question and Overall*

Question	Mean rating
Q1 If a book or article is interesting, I don't care how hard it is to read.	3.71
Q2 Without reading, my life would not be the same.	3.65
Q3 My friends sometimes are surprised at how much I read.	3.24
Q4 My friends and I like to exchange books or articles we particularly enjoy.	3.29
Q5 It is very important to me to spend time reading.	3.88
Q6 In comparison to other activities, reading is important to me.	3.71
Q7 If I am going to need information from material I read, I finish the reading well in advance of when I must know the material.	3.71
Q8 Work performance or university grades are an indicator of the effectiveness of my reading.	3.71
Q9 I set a good model for others through reading.	3.71
Q10 I read rapidly.	3.59
Q11 Reading helps make my life meaningful.	3.82
Q12 It is important to me to get compliments for the knowledge I gather from reading.	3.06
Q13 I like others to question me on what I read so that I can show my knowledge.	3.41
Q14 I don't like reading technical material.	3.00
Q15 It is important to me to have others remark on how much I read.	2.76
Q16 I like hard, challenging books or articles.	3.53
Q17 I don't like reading material with difficult vocabulary.	3.47
Q18 I do all the expected reading for work or university courses.	3.82
Q19 I am confident I can understand difficult books or articles.	3.88
Q20 I am a good reader.	4.29
Q21 I read to improve my work or university performance.	4.12
<b>Mean rating overall</b>	<b>3.59</b>

*Note.* Reading motivation scale ratings: 1-*Strongly disagree*, 2-*Disagree*, 3-*Neither agree nor disagree*, 4-*Agree*, 5-*Strongly agree*.

Table 4.12 captures differences in reading motivation by gender, year as an undergraduate, and race/ethnicity. Though the minority sample comes with the caveat that it should be used with caution and for exploration only, the sample revealed that males professed greater reading motivation than females, as did juniors over seniors, and Black students over Hispanic students. Moreover, compared to the national sample, males and juniors were more motivated than their national counterparts; and females, seniors,

and Black undergraduates were less motivated than their national counterparts. Only Hispanic students posted similar results regardless of sample.

**Table 4.12** *Minority Sample: Mean Rating of Reading Motivation Scale – By Gender, Year as Undergraduate, Race/Ethnicity*

Read motivation scale	Gender		Year as undergraduate		Race/Ethnicity	
	Male	Female	Junior	Senior	Black	Hispanic
Mean rating	3.63	3.56	3.67	3.54	3.61	3.56

*Note.* Reading motivation scale ratings: 1-*Strongly disagree*, 2-*Disagree*, 3-*Neither agree nor disagree*, 4-*Agree*, 5-*Strongly agree*.

For the local sample of minority undergraduates, Reading to Do Well in Other Realms was the dominant reading motivation ( $M = 3.84$ ,  $SD = 0.17$ ), followed by Reading Efficacy ( $M = 3.65$ ,  $SD = 0.40$ ), Reading as Part of Self ( $M = 3.61$ ,  $SD = 0.22$ ), and Reading for Recognition ( $M = 3.08$ ,  $SD = 0.26$ ). These results were similar to those of the national sample, with students being most motivated to read to do well in other realms and least motivated to read for recognition. Table 4.13 further clarifies the value students placed on Reading to Do Well in Other Realms, regardless of category.

**Table 4.13** *Minority Sample: Four Factors of Reading Motivation – Mean Rating by Gender, Year as Undergraduate, Race/Ethnicity*

Factor	Gender		Year as undergraduate		Race/Ethnicity	
	Male	Female	Junior	Senior	Black	Hispanic
Reading as Part of Self	3.63	3.60	3.73	3.55	3.68	3.48
Reading Efficacy	3.71	3.60	3.75	3.59	3.65	3.64
<b>Do Well in Other Realms</b>	<b>3.93</b>	<b>3.78</b>	<b>3.79</b>	<b>3.86</b>	<b>3.80</b>	<b>3.92</b>
Reading for Recognition	3.05	3.10	3.22	3.00	3.06	3.11

*Note.* Reading motivation scale ratings: 1-Strongly disagree, 2-Disagree, 3-Neither agree nor disagree, 4-Agree, 5-Strongly agree.

### **Minority Sample: Retrieval Practice – Research Question 2**

Table 4.14 supplies the number of facts retrieved by the minority sample, according to the reading passage. Specifically, for reading passage A, 9 of 17 undergraduates failed to retrieve any information on the topic (comments were not relevant to the passage or incorrect details were provided), recalled only the topic, or retrieved only a single fact. For reading passage B, 5 of 17 undergraduates faced the same challenges; and for reading passage C, 6 of 17 students demonstrated limited or nonexistent retrieval practice. Moreover, this minority sample did not match the national sample for the maximum number of codes (each representing a fact recalled) retrieved per passage. For example, for reading passages A, B, and C, the undergraduates nationwide retrieved up to 11, 8, and 13 codes, respectively. In comparison, the minority sample posted maximum numbers of 5, 4, and 6 codes, respectively.



**Table 4.14** *Minority Sample: Number of Facts Retrieved by Students – By Reading Passage*

Reading Passage A		Reading Passage B		Reading Passage C	
Number of facts retrieved	Number of students	Number of facts retrieved	Number of students	Number of facts retrieved	Number of students
0	2	0	1	0	1
1	7	1	4	1	5
2	3	2	7	2	7
3	3	3	3	3	1
4	1	4	2	4	1
5	1			5	1
				6	1
total	17	total	17	total	17

For the minority sample, the aggregate of codes retrieved per student ranged from 3 to 15, with a mean of 6.29 and a median of 5. The skew of 1.08 indicated little distortion in the distribution, and the kurtosis of 0.72 showed that the platykurtic distribution had few outliers. In contrast to the national sample, the minority sample had a higher mean and median, as well as a more even distribution across students, as evidenced by the skew and kurtosis. However, the best-performing student from the minority sample retrieved an aggregate of 15 codes, or discrete facts, from the three reading passages, while the top student from the national sample retrieved an aggregate of 32 codes. That discrepancy translates into a 53% better result in retrieval practice for the White male student from the national sample.

Table 4.15 confirms that, out of the three reading passages, these undergraduates struggled most to demonstrate retrieval practice with passage A (psychology excerpt) and were most successful with passage B (intellectual property and copyright excerpt). Out of this research study participant pool, males found every passage more challenging than females did; and overall, seniors were more effective at demonstrating retrieval practice than juniors. Furthermore, Black student participants seemed to be challenged by all

reading passages, with 61% of this group producing nothing, only the topic, or a single fact. Meanwhile, while Black student participants imparted little retrieval practice skill, Hispanic undergraduate participants more successfully exhibited their retrieval practice abilities. Moreover, results showed that members of the minority group were more likely to retrieve something (albeit not a lot) compared to the nationwide sample, perhaps because these undergraduates averaged 13.01 minutes to complete the survey compared to their peers nationwide, who averaged 9.22 minutes for the survey.

**Table 4.15** *Minority Sample – Retrieval Practice: Percentage of Students who Retrieved Nothing, the Topic, or a Single Fact – By Gender, Year as Undergraduate, Race/Ethnicity*

<u>Category</u>	<u>Number of students</u>	<u>Reading Passage A</u>	<u>Reading Passage B</u>	<u>Reading Passage C</u>	<u>Overall average</u>
<b>Entire sample</b>	17	53%	29%	35%	39%
<b><u>Gender</u></b>					
Male	7	57%	43%	57%	52%
Female	10	50%	20%	20%	30%
<b><u>Year as undergrad</u></b>					
Junior	6	50%	50%	33%	44%
Senior	11	55%	18%	36%	36%
<b><u>Race/Ethnicity</u></b>					
Black	11	82%	45%	55%	61%
Hispanic	6	0%	0%	0%	0%

**Minority Sample: Covariance Analysis – Research Question 3**

The covariance analysis of reading motivation and retrieval practice revealed that, overall, reading motivation and retrieval practice covaried by 0.99 (as seen in Table 4.16), which was negligibly more than the national sample’s covariance of -0.72. Among the categories, females, juniors, and Hispanic students demonstrated greater covariance than males, seniors, and Black students, respectively. Furthermore, the national sample of female, senior, Black, and Hispanic undergraduates posted negative covariances, indicating an inverse relationship in which greater reading motivation paired with lower

retrieval practice skills, and vice versa. In contrast, the minority sample's female, senior, Black, and Hispanic groups revealed positive covariances.

**Table 4.16** *Minority Sample: Covariance Analysis of Reading Motivation and Retrieval Practice*

	<b>Overall</b>	<b>Gender</b>		<b>Year as undergraduate</b>		<b>Race/Ethnicity</b>	
		Male	Female	Junior	Senior	Black	Hispanic
Covariance	<b>0.99</b>	-1.81	2.64	-0.84	0.16	2.18	2.39

### **Minority Sample: Correlation Analysis – Research Question 3**

Correlation analysis indicated a low positive correlation between reading motivation and retrieval practice ( $n = 17$ ,  $r = 0.10$ ). However, Black students in the minority sample ( $r = 0.21$ ) indicated a stronger correlation than their Black counterparts in the national sample ( $r = 0.00$ ). Regardless, while the national sample revealed statistically significant results among freshman, Asian, and Hispanic students, results from the minority sample were less robust. Comparatively, in the minority sample, the Hispanic undergraduates demonstrated the strongest correlation and were the only group to approach statistical significance ( $r = 0.46$ ,  $p = 0.06$ ).

#### **National Sample versus Minority Sample: Achievement Disparity**

Comparisons between samples remained exploratory, but a cautious examination of results revealed interesting disparities. In the national sample, students who were White, Black, and Hispanic averaged reading motivation scores of 3.73, 3.83, and 3.57, respectively (The scale ranged from 1, the least motivated, to 5, the most motivated). However, within that national sample, students who were White demonstrated superior retrieval practice skills, and in less time, than the collective of minority counterparts (see Table 4.17). In contrast, the minority sample's Black and Hispanic students recorded self-professed reading motivation scores of 3.61 and 3.56,

respectively, averages that were a bit lower than the national yield. Yet even with substantially more time, these minority students could not match the achievement level of White undergraduates from the national sample.

**Table 4.17** *National Sample vs. Minority Sample: Retrieval Practice Achievement across all Reading Passages*

<u>Sample</u>	<u>Quantity</u>	<u>Aggregate number of codes</u>	<u>Average number of codes per person</u>	<u>Average time to take survey (in minutes)</u>
<b><u>National sample</u></b>				
Whites	49	326	6.65	9.20
Minorities	41	198	4.82	9.24
<b><u>Minority sample</u></b>				
Minorities	17	107	6.29	13.01

An additional comparison based on the time to complete the survey further highlighted the achievement gap between Whites and minorities. Specifically, while the minority sample averaged 13.01 minutes for the survey, 13 students in the nationwide sample spent a similar amount of time, 11 to 13 minutes, completing the survey. Results showed that, among those 13 students, the 7 White undergraduates averaged a retrieval of 10.71 codes, or facts from the reading excerpts, while the 6 minority students averaged only 7.33 codes in the same amount of time – a 32% decrease in achievement for the minority students in the national sample. While the non-random composition of the minority sample precludes any definitive conclusions or comparisons, these results do raise questions about the impact of reading motivation and retrieval practice for diverse groups.

### Summary

Chapter 4 includes an overview of the study, along with a summarization of the sample characteristics and data results and findings from two samples. The quantitative data related to reading motivation were analyzed overall and with attention to the four

factors of reading motivation: Reading as Part of Self, Reading Efficacy, Reading to Do Well in Other Realms, and Reading for Recognition. The qualitative data related to retrieval practice were scrutinized for each of the three reading passages. Lastly, results and findings were examined to determine correlations between reading motivation and retrieval practice, especially in relation to gender, year as an undergraduate, and race/ethnicity.

## **CHAPTER 5: IMPLICATIONS**

The final chapter of this dissertation includes an overview of this mixed methods research study, which outlines the purpose of the research, the problem, the methodology, the research questions, the results and findings, and the significance of the research. With a recapitulation of the parameters of the research study and an exploration of the study's impact for teaching and instruction, the chapter then presents a discussion related to the three research questions. Next, a reflection of personal and professional development and recommendations for future research are examined. The chapter concludes with a summary of the dissertation.

### **Overview of Research Study**

The purpose of this mixed methods research study was to gauge the reading motivation and retrieval practice skills of undergraduates aged 18 to 23 who were pursuing a bachelor's degree at a U. S. college or university or an associate's degree at a U. S. college or vocational/technical school. An additional purpose was to determine correlations between the two variables, particularly for gender, year as an undergraduate, and race/ethnicity. Because reading motivation typically subsides for most students throughout their education (Levine et al., 2022), and many students are unfamiliar with retrieval practice and the extent to which it promotes retention of information and upgrades academic achievement (Agarwal et al., 2021), students are missing the opportunity to use reading motivation and retrieval practice to maximize their learning. Therefore, with the use of an online survey, the researcher posed the following research

questions: (1) What is the reading motivation of U. S. undergraduates aged 18 to 23?; (2) What is the retrieval practice ability of U. S. undergraduates aged 18 to 23?; (3) For U. S. undergraduates aged 18 to 23, how does reading motivation correlate with retrieval practice ability, particularly for different groups (e.g., based on gender, year as an undergraduate, and race/ethnicity)?

### **Research Study Findings**

This research effort, with its initial national sample and supplementary sample of diverse students, produced numerous results and findings. For instance, undergraduates professed to be somewhat motivated to read, but they were catalyzed by a particular kind of extrinsic motivation as opposed to any intrinsic motivation. More explicitly, the extrinsic regulator of reading for recognition did not compel them, but the extrinsic impetus of reading to do well in other realms held sway. In effect, students acted with autonomy to assimilate knowledge for the purpose of transferring it to new tasks or situations (Bruner, 1961). They recognized the value of reading motivation and its importance for achieving goals, so they acted with volition, regardless of whether they derived enjoyment from the activity or not (Ryan & Deci, 2020).

Regarding retrieval practice, gauging the true aptitude of undergraduates was difficult because the completion of a voluntary survey constituted a low-stakes assessment. Students, particularly males, tend to match their skill with their will, thereby faltering on the perseverance, self-control, and motivation needed to showcase their abilities (Attali, 2016; Borgonovi & Biecek, 2016). In this case, even a student's failure to spend the anticipated 17 minutes needed to thoroughly complete the survey resulted in repercussions in the form of low retrieval practice results.

The researcher attempted to minimize the confounding influences of reading fatigue, inability to focus, or lack of discipline that might have subverted student success with retrieval practice. For example, reading passages were ordered with the psychology text appearing first because of its subject-specific vocabulary and the possibility that undergraduates would not have encountered the concepts incidentally. The second passage, which covered intellectual property and the basics of copyright, used standard English vocabulary to explain a topic that might have been unfamiliar to undergraduates. The third passage, an excerpt on U. S. history, was placed last to account for possible loss of focus among undergraduates. The text was a straightforward narrative that should have resembled content that most American students would have reviewed as part of their school curriculum at some point, or several points, in their educations.

Despite the ordering of the reading passages, the psychology excerpt proved to be the most difficult for all except the seniors and Asian students from the national sample. Furthermore, White students managed to showcase better retrieval practice skills, and in less time, than the collective of races/ethnicities across both samples. One explanation for these outcomes stems from Bruner's (1961) claim that knowledge construction requires learner involvement in the process of learning. In this circumstance, many students might have perceived the reading passages, and the psychology excerpt, in particular, as a challenge that did not have value, incited little interest, and was therefore met with limited motivation (Ryan & Deci, 2020).

On a final note, though the Asian students ( $n = 9$ ) comprised only 10% of this particular national sample, which was obtained with a random sampling approach, results related to their reading motivation and retrieval practice offered intriguing insights. For



instance, a review of the national sample demonstrated that mean reading motivation scores for Black ( $M = 3.75$ ) and White ( $M = 3.69$ ) students were substantially greater than the scores for the collective group of Asian students ( $M = 3.25$ , median = 3.33), nearly all of whom fell one to three standard deviations below their peers. Yet this small group of students outperformed all others in retrieval practice. Moreover, they posted the strongest results (along with seniors from the national sample) in the psychology passage, which created the greatest obstacles in retrieval practice for all other students across both samples. In fact, even though the Asian undergraduates maintained low reading motivation scores, correlation between reading motivation and retrieval practice was statistically significant for this group ( $r = 0.33$ ,  $p = 0.00$ ).

These outcomes corroborated claims that Asian students were, indeed, enhancing their college readiness, despite the ongoing shortfalls that other collegians were experiencing (*ACT*, 2019; *SAT*, 2022). These results also furnished a glimpse of the effectiveness of retrieval practice for students with less professed reading motivation than their peers and indicated that students who were not highly motivated readers could still reap academic gains from retrieval practice. Finally, because retrieval practice benefits from motivation, undergraduates who are already motivated readers stand to fully realize the advantages of retrieval practice in their educational pursuits (Agarwal & Bain, 2019).

### **Significance of Research Study**

The significance of this research study was that it produced new and relevant knowledge for stakeholders and education communities (Wamba, 2011). Specifically, this study investigated gaps in the literature relating to the reading motivation and retrieval practice of undergraduates and scrutinized the findings among diverse groups

(Agarwal et al., 2020; Huang & Reynolds, 2022). It also illuminated how correlations between the two variables could highlight ways to augment the academic success of undergraduates and reduce achievement gaps for struggling students. For instance, undergraduates were motivated to read for extrinsic purposes related to performance or capitulation. In essence, they sought achievement for a non-reading goal (Schutte & Malouff, 2007a). Moreover, Asian undergraduates demonstrated superior skills in retrieval practice despite declaring the lowest reading motivation scores across all groups. Such results denote the promise of using reading motivation and retrieval practice separately or conjointly to raise academic accomplishments for students of diverse backgrounds and differing motivation levels. Additionally, this research study was significant to the ideation of interventions and strategies that might influence curriculum and pedagogy for reading motivation and retrieval practice. Lastly, though this study undoubtedly augmented the researcher's development as an educator/researcher, its value evolved from its ability to provide insights for educational excellence across national and local domains (Storm, 2016).

### **Implications of Research Study**

The implications of devaluing reading are dire academic shortfalls. For example, American College Testing reported that, as of 2019, U. S. high school graduates across the nation showed a 15-year decline in reaching the benchmarks associated with college readiness in English, with 36% of students failing to meet the mark for both English and reading (ACT, 2019). The College Board echoed the downfall with the most current SAT scores (SAT, 2022). To be exact, as students shifted their time and effort away from reading and toward other options, and along with the lingering effects of COVID-19, the

class of 2022 showcased a drop in SAT scores compared to 2021, with only 43% of students meeting the college readiness benchmarks for reading (SAT, 2022).

Despite the requirements of higher education, in which reading motivation significantly influences academic accomplishment, many undergraduates are simply unprepared to succeed (Florence et al., 2017; Huang & Reynolds, 2022). Students do not promote a habit of reading, in which the very act of reading broadens experiences, expands knowledge, and builds reading skills (Florence, 2017). Instead, they are more focused on digital media, television, and the Internet than they are on developing the necessary reading skills that translate into college success and future job opportunities (Levine, 2022). Consequently, their substandard literacy abilities may lead to academic struggles which deplete motivation and further jeopardize student advancement (Huang & Reynolds, 2022).

This research study highlighted the importance of capitalizing on the existing extrinsic motivation of undergraduates, but it also illuminated the fact that not all types of extrinsic motivation have the same effect on students. For instance, while Reading for Recognition was of little interest to undergraduates, Reading to Do Well in Other Realms was the overriding motivation, regardless of group or sample. This latter factor propelled students to express reading motivation for goals unrelated to reading, such as getting good grades or improving career opportunities (Ryan & Deci, 2000a). However, extrinsic motivation is multi-layered and encompasses degrees of autonomy. For example, while the student uses extrinsic motivation for some instrumental purpose, that intentional behavior can stem from either personal choice or reluctant compliance (Ryan & Deci, 2000a). Therefore, the educator's goal is to promote internalization, which leads to the

embodiment of a particular value or behavior; and integration, which transforms an external regulation into one in which the person takes ownership and connects it to himself or herself (Ryan & Deci, 2000a).

Extrinsic motivation that is linked to non-reading goals can be utilized to foster reading motivation and retrieval practice, which depends on motivation to bolster effectiveness (Agarwal & Bain, 2019). Plus, by nurturing an extant force, educators can encourage students' valuation and self-regulation of activities; and this can be accomplished by improving the autonomy, competence, and relatedness of students' academic experiences (Ryan & Deci, 2000a). For instance, student autonomy improves when educators give students choices and opportunities to take the initiative, provide a rationale for teaching strategies, and express interest in student viewpoints (De Naeghel et al., 2014). Student competence increases when teachers provide scaffolding, challenges, assistance, constructive criticism, sensitivity, and clear expectations (De Naeghel et al., 2014). Finally, relatedness evolves with personal relationships between educator and undergraduate (De Naeghel et al., 2014).

### **Discussion**

Overcoming student weaknesses that contribute to poor reading motivation and retrieval practice outcomes requires a multipronged approach. Teachers and educators need to consider methods of professional development, while school culture and community engagement should be strengthened (Lopez, 2017). Plus, culturally sustaining pedagogy and curriculum must become the norm (Ladson-Billings, 1995). Finally, undergraduates must remain accountable for their own motivational self-determination

and cognitive constructivist efforts toward the elevation of retrieval practice skills (Bruner, 1961).

### **Professional Development**

Educators may not always realize how their actions and beliefs influence school culture (Brown & Evans, 2017). However, if they want to prepare their students for the future and acknowledge the increasing diversity of school populations, they will turn to professional development as an excellent way to evaluate their own identities, raise awareness, engage in self-reflection, and develop a consciousness about issues that affect them as educators (Lopez, 2017). They will even take leadership roles in their respective educational settings and model desired behaviors which promote a culture of learning (Lopez, 2017).

When trying to create an environment that envelops social justice and academic excellence, administrators and educators can use professional development to help them recognize how and why reading motivation and retrieval practice are critical tools for school success for different student groups (Agarwal et al., 2021; Castillo, 2020). In fact, they can improve their practices, discuss issues with peers, study pedagogical learning strategies, nurture a collaborative culture, and build compassionate communities in their respective school environments (Brown & Evans, 2017). Moreover, professional learning can embed standards and accountability while promoting sound reform (Szpara, 2017).

Teachers can become both learners and leaders as they strive to raise the standards of their professional qualifications, acknowledge their ongoing journey of development, use what they have learned in their classrooms, and engage in research-based practices (Dagen & Bean, 2014). They can also foment student self-awareness and

self-efficacy while promoting self-management and relationship competencies (Brown & Evans, 2017). Furthermore, professional development helps educators examine biases or stereotypes that infringe on student identities, interfere with learning, or subjugate student motivation. Since social identities are influenced by family, neighborhood, school, and friends, educators should strive to incorporate undergraduates into a milieu that recognizes the uniqueness of all individuals (Jewell, 2020). After all, when educators embody leadership development and equity teams that foster a change in attitudes, they promote growth for themselves and their students (Szpara, 2017).

### **School Culture and Community Engagement**

As education professionals examine school contexts and spaces, the issues of marginalized groups, collaborative efforts, school culture, and responsive leadership are constant topics of conversation (Lopez, 2017). Success in the transformation of schools and educational experiences often depends on forging and fortifying relations of care and trust to include “listening, dialogue, critical thinking, reflective response, and making thoughtful connections among the disciplines and to life itself” (Noddings, 2012, p. 771). Moreover, these conversations provide a forum to explore how reading motivation and retrieval practice provide advantages to undergraduates, as well as how to distinguish the needs and abilities of individual students when integrating these tools. In short, education does not just require intelligence; it demands a sensitivity to morality and ethical matters (Noddings, 2013).

Dyce and Longmire-Avital (2017) elaborated on the value of engaging families and communities in the process of schooling. They believed that such interactions reduced the achievement gap, raised cultural awareness of administrators and staff, and

increased equity and academic success for students (Dyce & Longmire-Avital, 2017). Furthermore, increased communication among all parties dismantled the narrative that diverse communities were less interested or less committed to the success of their children's education than other groups (Dyce & Longmire-Avital, 2017). Therefore, the more families and communities know about the value of reading motivation and retrieval practice, the greater the network of support for undergraduates. This researcher can testify that, by guiding her own sons into positive learning experiences and staying engaged in the process, her sons were inclined to find value in their education and holistically relate it to their own lives.

### **Culturally Sustaining Pedagogy and Curriculum**

Educators have a history of cultural experiences and identities that impact their teaching. Students have their own histories that impact their learning. Together, these groups are distinct yet united on a path of academic accomplishment and educational fulfillment. Regardless of gender, year as an undergraduate, or race/ethnicity, the goal is to focus on learning; and this can be accomplished through culturally sustaining pedagogy and curriculum.

Ladson-Billings (1995) defined culturally relevant teaching as a “pedagogy of opposition” (p. 160). This pedagogy of opposition renounced individual efforts in favor of collective empowerment, and it incorporated three criteria: “(a) Students must experience academic success; (b) students must develop and/or maintain cultural competence; and (c) students must develop a critical consciousness through which they challenge the status quo of the current social order” (Ladson-Billings, 1995, p. 160). This type of teaching works to overcome biases and stereotypes associated with various

cultures and ethnicities and aims to overcome weaknesses by drawing strength from diversity (Ladson-Billings, 1995). Furthermore, by recognizing the weight of self-concept and self-esteem on student achievement and mindset, culturally relevant teaching espouses that students who are treated as capable will demonstrate capability (Bowman et al., 2018). Conversely, negative teacher attitudes and derogatory school culture can create self-fulfilling prophecies of perceived student inabilities and the perpetuation of achievement gaps among otherwise competent students (Bowman et al., 2018).

Alim and Paris (2017) highlighted the change in the purpose of schooling. For decades, schools served to assimilate students into a homogenized mold that required the forfeiture of their respective cultures, languages, histories, and literacies (Alim & Paris, 2017). However, the purpose of schooling has changed. Pluralistic societies have spawned new terms, theories, and practices (Alim & Paris, 2017). Now, culturally sustaining pedagogy is the goal, and that means retaining disparate cultural, linguistic, and literate pluralism for the sake of favorable social changes (Alim & Paris, 2017).

Along with culturally relevant teaching and curriculum, a pedagogy of caring is promoted. A pedagogy of caring benefits from open dialogue, as student and teacher exchange perspectives within school parameters and across real-life experiences (Bowman et al., 2018; Noddings, 2012). This give-and-take relationship, which is constructivist in nature, fosters global cooperation, personal connections, and extensive interactions (Bowman et al., 2018). It can be used to create an ongoing dialogue about effective student reading motivation and retrieval practice goals.

Educators who demonstrate this level of caring “expect great things from their students, convince them of their own brilliance, and help them reach their potential in a



disciplined, structured environment” (Alexander, 2016). These teachers build trust, learn from failure, and raise the bar of achievement (Alexander, 2016). Plus, by limiting negative stereotypes that inhibit positive identity conceptions, they instill insight, hope, and confidence in their students, thereby enhancing student engagement in the learning process, promoting a growth mindset, and scaffolding student success (Bowman et al., 2018). Furthermore, these interactions spur constructivist methods, in which the student builds meaning from experiences (Bruner, 1961). Finally, the facilitating teacher leads the student to be agentic in his or her learning (Isik, 2018). The result is a self-determined undergraduate who optimally exercises reading motivation and retrieval practice.

### **Student Responsibility: Self-Determination and Cognitive Constructivism**

Self-determination requires nudging motivation along a continuum, with the goal of shifting the learner from a point of limited or ineffective motivation to a position of productive motivation (Ryan & Deci, 2020). Though intrinsically motivated readers tend to be successful students, undergraduates who are extrinsically motivated and read to do well in other realms can be equally successful (van Steensel et al., 2019). At the same time, Bruner’s (1961) ideas of cognitive constructivism highlight how retrieval practice is linked with the construction of information. Each undergraduate is on a unique journey to learn and outline a path for maximizing capabilities (Bruner, 1961). Moreover, since each student must be active in the process of learning, the self-determination to express some kind of motivation is a key to success (Bruner, 1961; Ryan & Deci, 2020).

Within life’s events, cognitive, social, emotional, and physical experiences create the idiosyncratic building blocks for each learner (Rannikmäe et al., 2020). Assimilated attitudes, beliefs, and stored information add to that structure (Rannikmäe et

al., 2020). Consequently, every student has a different degree of reading motivation and a discrete level of retrieval practice ability. These discrepancies are not predicated solely on gender, year as an undergraduate, or race/ethnicity, but are endemic due to the vastness of human experiences and the uniqueness of every individual. Consequently, the most efficacious strategies and interventions for improving reading motivation and raising retrieval practice ability will take these factors into account.

Whether an undergraduate is intrinsically or extrinsically motivated, the teacher's application of autonomy supports and structures is critical (Ryan & Deci, 2020). Teachers should understand and acknowledge pupil perspectives, offer ways for students to take ownership of their work, present relevant choices that coincide with student interests, and offer a rationale for such operational processes (Ryan & Deci, 2020). In some situations, that might be as easy as recognizing that distinct reading motivations are associated with different types of texts and then creating reading assignments to achieve the desired effect (McGeown et al., 2020). In other cases, that might mean boosting retrieval practice through learning apps, clickers, writing prompts, multiple-choice or short answer questions, free recall, cued recall, or quizzes – whatever best stimulates the student to optimize higher order/transfer skills associated with content (Agarwal et al., 2020).

Regardless of educator intent, ultimately, the undergraduate must be responsible for developing proficiency in reading motivation and retrieval practice. As Bruner (1961) asserted, students are not passive but active in their own learning. Therefore, students must accept responsibility for their role in the process of scaffolding. Scaffolding is the provision of support to a learner so that the learner can develop the skills or abilities that

he or she does not presently have (Janson et al., 2020). It is a coactive process between teacher (meaning any knowledgeable person) and student; and it succeeds only when both parties accept responsibility to foster progress (Janson et al., 2020).

Bruner's (1961) theory of constructivism aptly correlates with scaffolding, and the structure of scaffolding can be applied to academic content, acts of caring, and life skills (Noddings, 2013). In truth, the process of caring, just like scaffolding, is collaborative. Each person has a responsibility in the procedure, and each person gains from the interaction (Noddings, 2013). Scaffolding further mimics the effects of caring by providing the educator with a way to give feedback to students, to offer clues about ways to move forward, to explain what to do, to model skills, and to question the students (van de Pol et al., 2010). An educator who implements the core components of care-based education and life skills is, indeed, helping students build a foundation that will last beyond the school year (Bowman et al., 2018). Undergraduates, in turn, bear the onus to use these strategies to optimize reading motivation and retrieval practice skills.

### **Reflection of Personal and Professional Development**

At the outset, I followed a personal interest in reading motivation and retrieval practice and devoured the literature to learn what I could about these topics. However, over time, the process of completing this dissertation created an anchor for future ideas and goals related to reading motivation and retrieval practice. I determined that my original theoretical framework of Bruner's (1961) cognitive constructivist theory and Ryan and Deci's (2020) self-determination theory was a good fit for the subject matter, and it supported the purpose and research questions for this study. Plus, the mixed methods approach produced meaningful data, and the online survey was an effective

research tool. I hope to build on this experience, reform my ideas as new research becomes available, and add to the conversation about integrating reading motivation and retrieval practice to enhance learning and improve academic achievement for all students. Ultimately, this journey fueled my personal interest in this dissertation topic, and from the professional perspective, it refined my skills and insights as an educator and researcher.

Going forward, I intend to develop additional research studies that differentiate types of extrinsic motivation that affect undergraduates' reading motivation and retrieval practice, with a view toward mitigating the motivation filtering that accompanies low-stakes assessments (Attali, 2016). With larger and more diverse national samples than the one used in this research study, I hope to present my findings at professional conferences so that other educators can glean useful components for their own endeavors.

### **Recommendations for Future Research**

Although a plethora of research extols the value of reading motivation and retrieval practice, questions still remain about how to maximize undergraduates' learning and growth. Many studies have not explored how differences in reading motivation and retrieval practice for undergraduates, as categorized by gender, year as an undergraduate, and race/ethnicity, need to be integrated so that each student can maximize his or her abilities. Therefore, a successful implementation of interventions and strategies designed to augment these two variables must account for the needs of all of today's students.

### **Recommendations for Reading Motivation Research**

Reading motivation is a complicated topic that incorporates many factors and dimensions into its conceptualization and even into its definition (Huang & Reynolds,

2022). Moreover, when motivation merges with individual learner characteristics and abilities, it can be difficult to explain, let alone harness for the sake of practical applications and interventions (Castillo, 2020). Therefore, viewing this issue within the framework of constructivism, in which individual differences are recognized, is vital to the development of practical applications (Efron & Ravid, 2020).

Future reading motivation strategies must encompass the varied cultures, habits, and values of the undergraduates they are designed to help (Huang & Reynolds, 2022). In addition, instructional programs derived from reading motivation research should be studied for effectiveness and feasibility so that researchers can discern if similar interventions produce similar results in diverse groups. Plus, given the lack of information explaining how schools and school culture impact reading motivation, future research should delve into the roles of educators and administrators, as well as the methods by which curriculum and policy can be modified to improve the reading environment (Huang & Reynolds, 2022). In fact, with teachers already on the front lines, collaborative efforts with students could evolve into a sharing of and promotion of responsibility, in which student-led efforts mandate both the need for and success of motivational programs. Lastly, because this research study outlined the value that undergraduates place on Reading to Do Well in Other Realms, which is a non-reading goal, additional studies on autonomous reading motivation within the framework of self-determination theory could supplement existing research (Huang & Reynolds, 2022; Levine et al., 2022).

## **Recommendations for Retrieval Practice Research**

Retrieval practice has been a robust phenomenon that benefits people of all ages, regardless of sample sizes, test formats, task criteria, educational materials, or retention intervals (Agarwal et al., 2021). It is also a viable option for diversified educational environments because it is not only practical; it is affordable and implementable (Agarwal et al., 2021). However, more research is needed. For instance, while much research has taken place in laboratory or applied settings, new endeavors could focus on retrieval practice in the real-world settings of flipped classrooms, student presentations, teacher lectures, and think-pair-share conversations (DeLozier & Rhodes, 2017). Furthermore, the effectiveness of retrieval practice needs to be distinguished according to class size, whether the retrieval practice is scheduled or a surprise, whether results from initial retrieval practice count toward grades, or even whether a test requires cumulative knowledge (Agarwal et al., 2021). Within these variations, researchers should gauge differences in results according to gender, year as an undergraduate, and race/ethnicity.

Many experiments concerning retrieval practice used science or psychology content (Agarwal et al., 2021). Consequently, future research needs to verify the efficacy of retrieval practice on non-science courses such as math, writing and literature, foreign languages, and skills-based learning (Agarwal et al., 2021). Moreover, exploring whether feedback is given to students and the timing of that feedback is important. Though feedback is common in classrooms, literature related to how feedback, either prompt or postponed, influences retrieval practice was sparse (Agarwal et al., 2021).

One modulating factor impacting the efficacy of applied research is the role of the researcher who is also the teacher, a situation identified as the Hawthorne effect or

“participant reactivity” (Paradis & Sutkin, 2017). In numerous college/university studies, the undergraduates’ teacher was also the researcher (Batsell et al., 2017). In contrast, in studies of kindergarten through twelfth grade students, the teachers were generally not the researchers (Agarwal, 2019). Considering that retrieval practice had a smaller effect size at the undergraduate level compared to the K-12 level, the role of the teacher-researcher might have been the cause (Agarwal et al., 2021). Of course, the larger sample sizes used for undergraduate studies compared to K-12 studies might have also contributed to discrepancies among results (Agarwal et al., 2021). Regardless, understanding the positionality of the teacher-researcher and its potential influences on retrieval practice requires investigation.

Future research could also explore the nature of collaboration on retrieval practice, as well as the implication of online learning (Agarwal et al., 2021). Online opportunities present the educator with input related to the timing and frequency of retrieval practice, as well as whether feedback is included or teacher input is to be expected by students (Agarwal et al., 2021). Above all, when considering the potential of retrieval practice in varied educational classrooms, researchers need to gauge how to integrate efficacious retrieval practice strategies to create the best package for educational success for disparate student populations.

## **Recommendations for Correlating Reading Motivation and Retrieval Practice**

### **Research**

This dissertation provided data about the correlations between reading motivation and retrieval practice, and future studies could build on these conclusions to continue untangling the relationship between these two variables. Also, prospective

studies could develop practical applications that guide educators to offset low reading motivation with retrieval practice strategies; or offset poor retrieval practice with stronger reading motivation. Based on the results and findings of this research study, researchers might be interested in determining if the connection between reading motivation and retrieval practice can be replicated with larger samples of diverse groups. This researcher's hope was that this research study would provide usable knowledge that could be applied to the efforts of other researchers and educators to enhance social justice and promote the academic accomplishments of different undergraduate populations.

### **Summary of the Dissertation**

This dissertation provided missing information in the literature about the reading motivation and retrieval practice of undergraduates (Huang & Reynolds, 2022; Kambara et al., 2021). More specifically, it delineated results and findings related to diverse groups and supplied insights to guide various stakeholders and educational communities which are committed to the academic needs of all undergraduates (Herr & Anderson, 2015). In fact, this research study's conclusions could inform national and local curriculum and pedagogy choices across many settings. Ultimately, this research stood to encourage thoughts and conversations related to strategies that could narrow students' academic deficiencies, support social justice, and ignite change in reading motivation and retrieval practice expectations.



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**APPENDIX A: PERMISSION TO USE THE ADULT MOTIVATION FOR  
READING SCALE (SCHUTTE & MALOUFF, 2007b)**

From: Perneti, Robyn <ROBYNP@email.sc.edu>  
Sent: 17 March 2022 19:07  
To: Flude, Annabel <Annabel.Flude@tandf.co.uk>  
Subject: Re: permission request

Dear Ms. Flude,

Thank you for your quick response. I will be sure to acknowledge Taylor and Francis Group ([www.tandfonline.com](http://www.tandfonline.com)) with any use of the Adult Motivation for Reading Scale (Schutte & Malouff, 2007).

Thank you.

Robyn Perneti  
.....

From: Flude, Annabel <Annabel.Flude@tandf.co.uk>  
Sent: Thursday, March 17, 2022 1:27 PM  
To: Perneti, Robyn <ROBYNP@email.sc.edu>  
Cc: Flude, Annabel <Annabel.Flude@tandf.co.uk>  
Subject: RE: permission request  
Dear Robyn Perneti

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From: Perneti, Robyn <[ROBYNP@email.sc.edu](mailto:ROBYNP@email.sc.edu)>  
Sent: 17 March 2022 15:52  
To: Flude, Annabel <[Annabel.Flude@tandf.co.uk](mailto:Annabel.Flude@tandf.co.uk)>  
Subject: Re: permission request

Dear Ms. Flude,

I am requesting permission to use Appendix A (pp. 488-489) from

Schutte, N. S., & Malouff, J. M. (2007). Dimensions of reading motivation: Development of an adult reading motivation scale. *Reading Psychology*, 28(5), 469–489.  
<https://doi.org/10.1080/02702710701568991>

I would like to use this Motivation Scale as part of an online survey in my doctoral research.

Thank you very much.

Sincerely,

Robyn Perneti

**APPENDIX B: INSTITUTIONAL REVIEW BOARD APPROVAL**



**OFFICE OF RESEARCH COMPLIANCE**

**INSTITUTIONAL REVIEW BOARD FOR HUMAN RESEARCH  
APPROVAL LETTER for EXEMPT REVIEW**

Robyn Perneti  
XXXXXXXXXXXXXXXXXX  
XXXXXXXXXXXXXXXXXX

Re: **Pro00119897**

Dear Robyn Perneti:

This is to certify that the research study ***A Mixed-Methods Research Study of Reading Motivation and Retrieval Practice of United States Undergraduates Aged 18 to 24*** was reviewed in accordance with 45 CFR 46.104(d)(2) and 45 CFR 46.111(a)(7), the study received an exemption from Human Research Subject Regulations on **3/21/2022**. No further action or Institutional Review Board (IRB) oversight is required, as long as the study remains the same. However, the Principal Investigator must inform the Office of Research Compliance of any changes in procedures involving human subjects. Changes to the current research study could result in a reclassification of the study and further review by the IRB.

Because this study was determined to be exempt from further IRB oversight, consent document(s), if applicable, are not stamped with an expiration date.

All research related records are to be retained for at least three (3) years after termination of the study.

The Office of Research Compliance is an administrative office that supports the University of South Carolina Institutional Review Board (USC IRB). If you have questions, contact Lisa Johnson at [lisaj@mailbox.sc.edu](mailto:lisaj@mailbox.sc.edu) or (803) 777-6670.

Sincerely,

Lisa M. Johnson  
ORC Associate Director and IRB Manager

## **APPENDIX C: ONLINE SURVEY FOR UNDERGRADUATES AGED 18 TO 23**

Are you an UNDERGRADUATE aged 18 to 23?

In other words,  
are you pursuing a bachelor's degree at a college or university  
or an associate's degree at a college or vocational/technical school?

Then you are invited to participate in the following research study.

Dear Undergraduate,

My name is Robyn Perneti. I am a doctoral candidate in the Instruction and Teacher Education Department at the University of South Carolina. I am conducting a research study as part of the requirements of my degree in Educational Practice and Innovation, and I would like to invite you to participate.

I am studying reading motivation and retrieval practice in U. S. undergraduates aged 18 to 23. If you decide to participate, you will be asked to complete an online survey.

In particular, you will be asked to rate your reading motivation and to demonstrate your ability to retain information from 3 reading passages. The survey should take approximately 17 minutes.

Participation is anonymous, which means that no one will know what your answers are. So, please do not write your name or other identifying information on any of the study materials.

I will be happy to answer any questions you have about the study. You may contact me at ROBYNP@email.sc.edu. If you have any questions related to your rights as a research subject, contact the University of South Carolina's Office of Research Compliance at (803) 777-6670.

Thank you for your consideration. If you would like to participate, please proceed with the survey and follow instructions for submission on the final page.

With kind regards,

Robyn Perneti  
ROBYNP@email.sc.edu  
\*\*\*\*\*

Please complete these questions on **reading motivation**.

Adult Motivation for Reading Scale (Schutte & Malouff, 2007)

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Following are statements about reading. For each statement, please decide what is most true for you and write a number next to the statement using the following scale:

1	2	3	4	5
Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

Your rating

Item

- Q1. If a book or article is interesting, I don't care how hard it is to read.
- Q2. Without reading, my life would not be the same.
- Q3. My friends sometimes are surprised at how much I read.
- Q4. My friends and I like to exchange books or articles we particularly enjoy.
- Q5. It is very important to me to spend time reading.
- Q6. In comparison to other activities, reading is important to me.
- Q7. If I am going to need information from material I read, I finish the reading well in advance of when I must know the material.
- Q8. Work performance or university grades are an indicator of the effectiveness of my reading.
- Q9. I set a good model for others through reading.
- Q10. I read rapidly.
- Q11. Reading helps make my life meaningful.
- Q12. It is important to me to get compliments for the knowledge I gather from reading.
- Q13. I like others to question me on what I read so that I can show my knowledge.
- Q14. I don't like reading technical material.
- Q15. It is important to me to have others remark on how much I read.
- Q16. I like hard, challenging books or articles.
- Q17. I don't like reading material with difficult vocabulary.
- Q18. I do all the expected reading for work or university courses.
- Q19. I am confident I can understand difficult books or articles.
- Q20. I am a good reader.
- Q21. I read to improve my work or university performance.

.....

## Reading Passages

You will be asked to read a passage and then write down what you recall about that passage. The process will be repeated 3 times, with Passage A, Passage B, and Passage C.

Instructions:

Carefully **read** Passage A. Take as long as you wish. When you are ready, proceed to the next screen and **write** everything you recall from the passage. (Typing qualifies as writing in this case). Once you leave this page, you will not be able to return to it.

### Passage A      Psychology Cells of the Nervous System

#### Neuron Structure

Neurons are the central building blocks of the nervous system, 100 billion strong at birth. Like all cells, neurons consist of several different parts, each serving a specialized function. A neuron's outer surface is made up of a **semipermeable membrane**. This membrane allows smaller molecules and molecules without an electrical charge to pass through it, while stopping larger or highly charged molecules.

The nucleus of the neuron is located in the **soma**, or cell body. The soma has branching extensions known as **dendrites**. The neuron is a small information processor, and dendrites serve as input sites where signals are received from other neurons. These signals are transmitted electrically across the soma and down a major extension from the soma known as the **axon**, which ends at multiple **terminal buttons**. The terminal buttons contain **synaptic vesicles** that house **neurotransmitters**, the chemical messengers of the nervous system.

Axons range in length from a fraction of an inch to several feet. In some axons, glial cells form a fatty substance known as the **myelin sheath**, which coats the axon and acts as an insulator, increasing the speed at which the signal travels. The myelin sheath is not continuous and there are small gaps that occur down the length of the axon. These gaps in the myelin sheath are known as the **Nodes of Ranvier**. The myelin sheath is crucial for the normal operation of the neurons within the nervous system: the loss of the insulation it provides can be detrimental to normal function.

In healthy individuals, the neuronal signal moves rapidly down the axon to the terminal buttons, where synaptic vesicles release neurotransmitters into the synaptic cleft. The **synaptic cleft** is a very small space between two neurons and is an important site where communication between neurons occurs. Once neurotransmitters are released into the synaptic cleft, they travel across it and bind with corresponding receptors on the dendrite of an adjacent neuron. **Receptors**, proteins on the cell surface where neurotransmitters attach, vary in shape, with different shapes "matching" different neurotransmitters.

How does a neurotransmitter “know” which receptor to bind to? The neurotransmitter and the receptor have what is referred to as a lock-and-key relationship—specific neurotransmitters fit specific receptors similar to how a key fits a lock. The neurotransmitter binds to any receptor that it fits.

Source:

Spielman, R. M., Jenkins, W. J., & Lovett, M. D. (2020). *Psychology 2e* (Second edition.). OpenStax College, Rice University.

Access for free at <https://openstax.org/books/psychology-2e/pages/1-introduction>

Section URL: <https://openstax.org/books/psychology-2e/pages/3-2-cells-of-the-nervous-system>

\*\*\*\*\*

Q22 Write everything you recall from **Passage A**. Take as long as you need to write the details, ideas, and information you recall from the passage.

--fill in

\*\*\*\*\*

Instructions:

Carefully **read** Passage B. Take as long as you wish. When you are ready, proceed to the next screen and **write** everything you recall from the passage. (Typing qualifies as writing in this case). Once you leave this page, you will not be able to return to it.

### **Passage B      Introduction to Intellectual Property The Basics of Copyright**

A copyright is an intellectual property right granted by a government to the author of an original literary, dramatic, musical, artistic, or other eligible creative work that gives them the exclusive right to control how the work is published, reproduced, performed, or displayed—as well as whether or not derivative works (e.g., a movie version of a novel) may be produced.

In the United States, the legal foundation for copyright is set forth, along with that for patents, in Article 1, Section 8, Clause 8 of the U. S. Constitution. This clause gives Congress the authority to “promote the progress of Science and useful Arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.”<sup>1</sup>

Congress and the courts have interpreted the terms “authors” and “writings” very broadly so as to include the creators of a wide variety of artistic and intellectual works. Title 17 of the United States Code authorizes the grant of a copyright to the authors of “original works of authorship”—including literary works, dramatic works, choreographic works, graphic works, audiovisual works, sound recordings, and architectural works. In most cases, a copyright lasts for the life of the author plus 70 years.



## Copyrights vs. Patents

Unlike the case with patents, the United States never developed an examination system for determining whether or not a creative work merits copyright protection. That’s because while the validity of an invention can be evaluated fairly objectively based on its utility, novelty, and non-obviousness, the merit of any cultural work is a far more subjective affair, as demonstrated by the frequency with which publishers reject novels that later go on to become literary classics.

What the patent and copyright systems share, however, is the recognition that unless the inherent property rights of inventors and authors to their creations are protected, the wellsprings of creation and productivity would be negatively affected by the reduced incentive. Both systems also share the public policy goal of marshaling the benefits of individual creativity—whether technological, as in the case of inventions, or cultural, as in literary works—to the public good so that these promote the progress of the nation and the “general welfare” of its citizens.

### Footnote

- <sup>i</sup>U. S. Constitution Arr. 1, § 8

Source:

Kline, D., & Kappos, D. (2021). *Introduction to Intellectual Property*. OpenStax College, Rice University. Access for free at <https://openstax.org/books/introduction-intellectual-property/pages/1-introduction>  
Section URL: <https://openstax.org/books/introduction-intellectual-property/pages/3-1-the-basics-of-copyright>

Attributed to The Michelson 20MM Foundation.

.....

Q23 Write everything you recall from **Passage B**. Take as long as you need to write the details, ideas, and information you recall from the passage.

--fill in

.....

Instructions:

Carefully **read** Passage C. Take as long as you wish. When you are ready, proceed to the next screen and **write** everything you recall from the passage. (Typing qualifies as writing in this case). Once you leave this page, you will not be able to return to it.

### Passage C      U. S. History Dutch Colonial Ambitions

#### Fur Trading in New Netherland

The Dutch Republic emerged as a major commercial center in the 1600s. Its fleets plied the waters of the Atlantic, while other Dutch ships sailed to the Far East, returning with

prized spices like pepper to be sold in the bustling ports at home, especially Amsterdam. In North America, Dutch traders established themselves first on Manhattan Island.

One of the Dutch directors-general of the North American settlement, Peter Stuyvesant, served from 1647 to 1664. He expanded the fledgling outpost of New Netherland east to present-day Long Island, and for many miles north along the Hudson River. The resulting elongated colony served primarily as a fur-trading post, with the powerful Dutch West India Company controlling all commerce. Fort Amsterdam, on the southern tip of Manhattan Island, defended the growing city of New Amsterdam. In 1655, Stuyvesant took over the small outpost of New Sweden along the banks of the Delaware River in present-day New Jersey, Pennsylvania, and Delaware. He also defended New Amsterdam from Native American attacks by ordering enslaved Africans to build a protective wall on the city's northeastern border, giving present-day Wall Street its name.

New Netherland failed to attract many Dutch colonists; by 1664, only nine thousand people were living there. Conflict with Native peoples, as well as dissatisfaction with the Dutch West India Company's trading practices, made the Dutch outpost an undesirable place for many migrants. The small size of the population meant a severe labor shortage, and to complete the arduous tasks of early settlement, the Dutch West India Company imported some 450 enslaved Africans between 1626 and 1664. (The company had involved itself heavily in the slave trade and in 1637 captured Elmina, the slave-trading post on the west coast of Africa, from the Portuguese.) The shortage of labor also meant that New Netherland welcomed non-Dutch immigrants, including Protestants from Germany, Sweden, Denmark, and England, and embraced a degree of religious tolerance, allowing Jewish immigrants to become residents beginning in the 1650s. Thus, a wide variety of people lived in New Netherland from the start. Indeed, one observer claimed eighteen different languages could be heard on the streets of New Amsterdam. As new settlers arrived, the colony of New Netherland stretched farther to the north and the west.

Source:  
Corbett, P. S., Janssen, V., & Lund, J. M. (2015). *U. S. History*. OpenStax College, Rice University.  
Access for free at <https://openstax.org/books/us-history/pages/1-introduction>  
Section URL: <https://openstax.org/books/us-history/pages/3-2-colonial-rivalries-dutch-and-french-colonial-ambitions>

.....

Q24 Write everything you recall from **Passage C**. Take as long as you need to write the details, ideas, and information you recall from the passage.

-- fill in

.....

Q25 Did you **read** the three passages?

Yes

No, I used an audio function or some other method to listen to at least one passage

Other --fill in

Q26 Did you **write** your responses to the three passages?

Yes

No, I spoke into a device that recorded my words for at least one passage

Other --fill in

.....

Please supply some information about yourself.

Q27 What degree are you pursuing?

Associate's

Bachelor's

Other --fill in

Q28 In what year are you as an undergraduate?

Freshman

Sophomore

Junior

Senior

Other --fill in

Q29 What is your major or area of concentration at school?

--fill in

Q30 In which U. S. state or other location/country do you presently reside?

--fill in

.....

Q31 Any **comments** you would like to add?

--fill in

Thank you for your participation!

## APPENDIX D: READING MOTIVATION: CODES FOR READING PASSAGE A

Code	Description
1	no relevant information
2	topic
3	mention of key scientific terms (not related to topic)
4	neurons are building blocks of nervous system/significance in body, brain
5	neurons number 100 billion
6	neurons are cells of the nervous system
7	cells send messages to brain, communicate with other cells
8	mention of soma and function
9	mention of dendrites and function
10	mention of semipermeable membrane or cells in context
11	function of semipermeable membrane
12	mention of axon in context
13	functions related to axon
14	mention of myelin sheath (in context) and function
15	mention of Nodes of Ranvier and function
16	mention of synaptic cleft/vessels and function
17	receptors, neurotransmitters, electric and chemical signals in context
18	neurotransmitters, receptors, synapses – fit together, lock and key
19	nucleus of neuron is in cell body
20	mention of terminal buttons and function
21	excerpt published in 2020

## APPENDIX E: READING MOTIVATION: CODES FOR READING PASSAGE B

Code	Description
1	no relevant information
2	topic
3	copyright is related to government, U. S. history, law
4	copyright is intellectual property granted by government
5	excerpt published in 2021
6	interpretation of “authors” and “writings” includes many creators with a range of works
7	copyright for author’s property – give credit to owner for creative work
8	copyrights do not have examination system, patents do – art and cultural works are subjective compared to inventions
9	copyright covers different media, music, ideas, varied material
10	laws of copyright, infringement and punishment, loopholes, what can and cannot be done
11	copyright ensures compensation – does not belong to user but to creator
12	must create ideas on own or with partners, copyright protects brands from being copied
13	creator has input on derivative content, duplication, reproduction
14	mention of copyright infringement Article 1, Section 8 of the U. S. Constitution
15	inventions are protected under U. S. law with patents
16	copyright lasts the life of the author plus 70 years
17	the excerpt ends with a footnote or sources cited
18	patents and copyright law must exist to increase innovation and advance culture, or creators will be less likely to do research and development

## APPENDIX F: READING MOTIVATION: CODES FOR READING PASSAGE C

Code	Description
1	no relevant information
2	topic
3	general mention of trade and effects, people wanted to live there (in the new colony)
4	mention of major commercial center in 1600s
5	information on fur trade
6	excerpt published in 2015
7	Dutch fleet sailed the Atlantic Ocean, charted the area, brought spices
8	mention of local places – Long Island, Hudson River, Manhattan
9	struggle and failure to attract colonists, dissatisfaction with trading practices
10	dealing with Natives, conflicts
11	Dutch welcomed Protestants, other Europeans, Jewish immigrants to become residents
12	mention of Dutch West India Company
13	general mention of slave trade
14	few residents meant shortage of labor
15	mention of Stuyvesant and the years he served, which were 1647-1664
16	Fort Amsterdam was needed to defend the city
17	by 1664, 9,000 people lived in New Netherland
18	identification of slave trade in years 1626-1664 and importation of 450 enslaved Africans
19	colonists built wall, which became Wall Street
20	information on land expansion and territory in Delaware and tri-state area
21	so many different people in colony, could hear 18 languages on the streets
22	excerpt was reliable because it listed its sources
23	Dutch were sailing to the Far East, bringing back pepper and other spices to Amsterdam