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SCRIPT RELATIVITY IN PSYCHOLINGUISTICS AND SOCIOLINGUISTICS: WRITING SYSTEMS AS A CATALYST FOR COGNITION AND CULTURE

Hye K. Pae

University of Cincinnati, Cincinnati, OH, U.S.A.

hye.pae@uc.edu

Gulbahar H. Beckett

Iowa State University, Ames, IA, U.S.A.

beckett@iastate.edu

Abstract

Script relativity posits that the writing system in which we read affects our thinking, information processing, cognitive mapping, and thought patterns. Given that script effects have been investigated primarily in psycholinguistics, this paper discusses the potential to extend the scope and sequence of research to a broader level of sociolinguistics. As the microscopic psycholinguistic analysis can be complemented by a macroscopic sociolinguistic view, the interplay among cognitive, linguocultural, and sociocultural variables can facilitate our holistic understanding of script effects. To this end, this paper provides an account of writing systems as a catalyst for building cognition and culture. The dynamic interaction between individual language processing (psycholinguistics) and language use in social and cultural contexts

(sociolinguistics) is discussed, which has both theoretical and methodological implications for future research, policy, and practice.

Keywords

Script Relativity, Semiotics, Cognition, Culture, Psycholinguistics, Sociolinguistics

1. Introduction

Language in spoken and written forms is a fundamental means to gain and transmit information in our lives. Given the inherent language-writing connection, our regular use of spoken and written languages on a daily basis is bound to have effects on the way we view, perceive, process, and interpret incoming information (Pae, 2020; Pegado, 2022). The effect of spoken language is captured by the *linguistic relativity hypothesis* (Whorf, 1956), while that of written language is understood through *the script relativity hypothesis* (Pae, 2020a; Pae, 2022; Winskel, 2022). In support of linguistic relativity and script relativity, Pegado (2022) further claims bidirectional relationships and effects between written language acquisition and brain functioning and cognition.

In the digital era, the role of written language has become crucial more than ever before with various types of texts. Regardless of differences in reading on screen and reading in print, the frequency of reading has dramatically increased on multiple platforms, such as texting, social media, hyperlinks, e-readers, and traditional text. As a result, the effects of reading are deemed substantial. In this spirit, this paper discusses script relativity and its relationships with semiotics, cognitive mapping, and culture. It also discusses how cognitive processes and further sociocultural behaviors are shaped by the writing system in which we read. Script relativity has been investigated primarily in psycholinguistics. As human cognition is closely tied to one's culture, script relativity should be further examined at the intersection of psycholinguistics and sociolinguistics.

2. Script Relativity

The *linguistic relativity hypothesis* (a.k.a., Sapir-Whorf hypothesis) posits that the language in which we speak shapes the way we think and view the world (Whorf, 1956). It indicates that linguistic structure, grammar, vocabulary, and semantics are likely to affect or shape the speaker's perception, cognitive processes, and thought patterns. It is of importance to note that

linguistic relativity has little to do with linguistic determinism, which was a complete misinterpretation of Whorf's theory (Pae, 2020a).

As an extension of the linguistic relativity hypothesis, the *script relativity hypothesis* (a.k.a., *writing system effects* or *script specificity*) theorizes that the writing system¹ in which we read affects and shapes readers' perception, cognitive mapping, and thought processes (Pae, 2020a; Pae, 2022; Winskel, 2022). Specifically, the unique and specific features as well as the characteristics of a writing system, such as alphabets, morphosyllabaries, syllabaries, and alphasyllabaries (a.k.a., abjads), yield the distinct cognitive functions and discrete patterns of information processing and problem solving as a consequence of reading or literacy over an extended period. The theoretical soundness of script relativity lies fundamentally in the close link between spoken language and a given writing system. Writing is a visual representation of spoken language. While linguistic relativity focuses on how linguistic structures influence thinking, script relativity centers specifically on how the features and characteristics of a writing system that are manifested in words internally and externally (i.e., intraword sublexical properties vs. between-word relationships, respectively) influence thinking, thought processes, information processing, memory recall, retrieval rate, and thought patterns.

Pae (2020a, 2022) has identified scriptal dimensions with which script relativity is involved, such as alphabets versus syllabaries (i.e., operating scriptal principle), linear writing (e.g., English, Arabic) versus block writing (Chinese, Korean Hangul, Japanese Kanji), spatial organization (i.e., text direction—left-to-right vs. right-to-left²), character crowdedness or density (i.e., how many strokes are used within a single character; how much information is represented within a single character), cognitive load (i.e., complex characters; a large number of characters to learn), and cultural characteristics manifested in a given script (e.g., extended version of collectivism vs. individualism). The operating principle of writing is fundamentally different across alphabetic writing and logographic/morphosyllabic writing; that is, the former is processed serially, while the latter is processed holistically (Sun et al., 2022). The operating principle is also related to linear writing versus block writing. Alphabetic writing systems are typically written

¹ Although the terms *script* and *writing system* are technically different from each other (see Pae, 2020), the two terms are used interchangeably in this article with slightly different nuances according to the context.

² There is also a script that is written from left to right and then from right to left in the following line interchangeably throughout the passage (e.g., the Luwian script). However, this is not considered a mainstream of writing direction.

linearly from left to right (e.g., English, Spanish, French, etc.) or from right to left (e.g., Arabic and Hebrew), with the exception of Korean Hangul which is an alphabetic script yet written in blocks.

The writing direction can influence the way in which readers perceive spatial relationships and organize objects in a sequential manner (see Pae, 2020a for more detail and examples). Research shows that writing direction indeed affects spatial cognition and time mapping. Specifically, Bergen and Lau (2012) examined spatial construals of time among speakers of English (left-to-right readers), Mandarin Chinese from mainland China (predominant left-to-right readers), and Mandarin Chinese from Taiwan (predominant top-to-bottom readers). Participants were asked to organize three pictures in a growing or sequential order (e.g., seed → sapling → tree; larva → pupa → butterfly; baby → girl → woman). Their results show that spatial organization for timeline is significantly different among the three groups with the Taiwanese group's dominant preference for top-to-bottom arrangement, compared to the other two groups.

The Chinese writing system and Japanese Kanji, known as logography or morphosyllabary, are visually dense within the block, except for basal characters comprising a small number of strokes (e.g., 一 meaning *one*; 人 meaning *person* or *human*). Most Chinese characters (about 80%) are compound characters with a combination of a phonetic radical to the left and a semantic radical to the right within the block (see Luo & Pae, 2023). The degree of character density and character complexities can affect readers' visual discrimination skills. Readers' visual discrimination skills can vary between alphabetic scripts and morphosyllabic scripts and between simplified Chinese characters and traditional Chinese characters (Chang & Perfetti, 2018).

Cognitive load engaged in reading can also vary across scripts. Learners of Chinese characters need to rote-memorize thousands of characters, while those of English learn to read using orthotactic combinatory rules for letters after mastering only 26 letters. Other than the dramatic difference in the number of minimal orthographic units to be mastered for reading in Chinese and English (i.e., about 3,000 characters vs. 26 letters), the complexity of characters in Chinese also requires heightened cognitive loads. An identification of complex characters is more cognitively demanding than that of simple characters.

Although it is difficult to test script relativity, an examination of the cognitive effects of various writing systems allows us to tease out specific script effects. An exploration of similarities

and differences in the perception and conceptualization of the outer world between readers who are raised in mono-script environments and those who are raised in multi-script environments can be instrumental for identifying script effects on perception, information processing, ~~and~~ interpretation, memory recall, and other cognitive functioning. A line of research into script-specific language processing can also broaden our knowledge of script effects on cognition. For example, cognitive demands of reading and writing in the Chinese writing system and alphabetic systems can be different because different writing systems can affect language processing differently.

It is important to note that while script relativity suggests that writing systems have a fundamental impact on cognition and thought processes, it does not indicate that a particular writing system or habitual reading in a certain script determines or limits the reader's thinking or cognitive abilities. Rather, script relativity underscores the dynamic interface among language, writing, perception, and thinking, with each influencing the other in various ways. Researchers continue to investigate the extent of script relativity and, in turn, its potential effects on language processing (i.e., inverse effects of script relativity) and cognitive mapping to gain a deeper understanding of how writing systems influence human cognition and thinking. A discussion of script relativity in a broader sense is in order, encompassing script effects on cognition and their extended effects on sociocultural domains.

3. Script Relativity, Cognition, and Culture

3.1. Semiotics, Writing Systems, and Script Relativity

Semiotics is the study of linguistic and nonlinguistic signs, sign systems, and symbols to understand how they are used to convey information and create meaning in communication and culture. As a study of interactions among signs, symbols, and meaning, semiotics comprises a wide range of aspects of human communication, including language, writing, gestures, images, symbolism, and other forms of representation, so that the interplay can be interpreted in the context of specific social and cultural domains.

Both semiotics and writing systems involve meaning-making processes by exploring relationships between sign systems and meaning. The two of them share some commonalities in terms of the use of signs and symbols, their representations and meaning, their associations with cultural and social contexts, and a tool for expressing ideas and participating in communication.

As semiotics involves signs, symbols, and their systems used to create meaning, in essence, writing systems are also a type of sign systems.

The close relationship between semiotics and writing systems has been examined from a semiographic perspective. Domashevskaya et al. (2022) consider that the Chinese writing system involves a semiographic framework of knowledge structures via the structure of characters in the intersection of grammatology and semiotics due to its logographic feature. Similarly, by taking advantage of the nature of multiscripts in the Japanese writing system, Matsuda (2023) applies a social semiotic multimodal approach to an examination of script-switching in text. These studies show inextricable relationships between semiotics and writing systems. Semiotics expands on its scope beyond linguistically based semiotics toward an inclusive semiology for multimodal meaning-making in signs (McDonald, 2012). As the physical materials on which written signs are written are important for social semiotics (see Cook, 2015), the platform on which words are written (i.e., in print vs. on screen) can also influence reading outcomes in terms of speed, accuracy, the level of understanding, and its effects. Pae (2020b) notes that the impact of reading in the printed text would be different from that of reading on screen. Digital texts include far more images and interactive entries (e.g., hyperlinks) than traditional texts. This textual difference can shape the impact of digital texts differently than that of traditional texts.

Although both semiotics and writing systems concern the relation between visual representation and meaning, the two are different in terms of the level of systematicity and specificity. Semiotics focuses on how signs represent concepts or referents and create meaning through the interaction of signs and their interpretations. In contrast, writing systems are more systematic and more organized than sign systems because they focus on how codified orthography represents spoken language and conveys meaning through their orthotactic rules represented in words. In a similar notion, the difference between semiotics and writing systems also lies largely in writing systems' interlocking relations with spoken language. Given that writing systems represent spoken language using written signs, the visual symbols of a writing system (e.g., letters, graphemes, or characters) are different across spoken languages. Differences can also be found in instrumental purposes. Semiotics examines how signs and symbols are used for expression and communication, while the writing system concerns how the specific features of written signs are processed and in turn influence the way in which cognitive mechanisms are involved.

From sociocultural perspectives, semiotics analyzes how signs and symbols are constructed and further influenced by cultural and social contexts, while writing concerns how scripts are chosen by cultural and social contexts. In this line, Unseth (2005) suggests an interplay among spoken language, script, and sociocultural contexts, by pointing out sociolinguistic parallels between languages and scripts chosen by a cultural community. Language and script are entrenched in cultural contexts and therefore influence the way in which sociocultural expressions, cultural identity, and communication patterns are expressed.

As semiotics studies how users interpret signs and symbols based on their cultural backgrounds and contexts, script relativity also concerns how different writing systems influence the way in which readers perceive and process written information, leading to script-specific cognitive effects. Figure 1 shows the interplay between semiotics and script relativity.

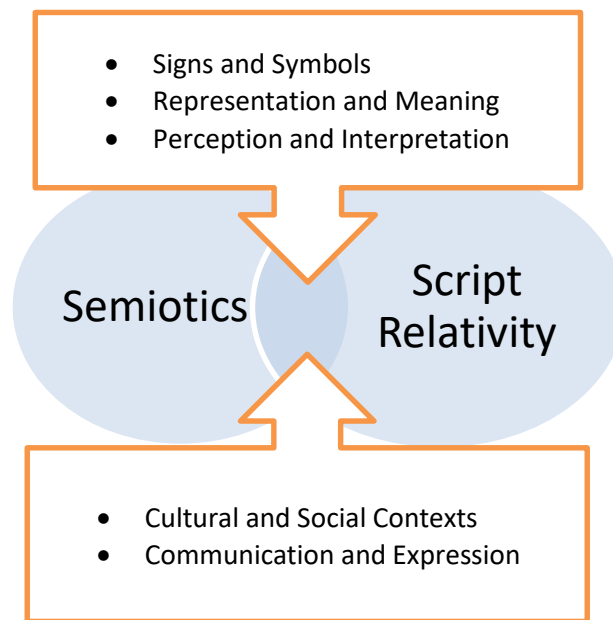


Figure 1: *Interplay between Semiotics and Script Relativity*

(Source: Authors' Own Illustration)

In short, although semiotics and writing systems share similarities, they have distinct concepts and different emphases on their own. Both semiotics and script relativity contribute to our understanding of how our communication and cognition are influenced by symbolic systems. Semiotics provides a broader theoretical framework than writing systems for analyzing various signs and symbols in various communication contexts, as it is not limited to writing systems and concerns various forms of both verbal and nonverbal representations. Script relativity narrows its

focus to the cognitive implications of different writing systems of language processing, perception, and thinking as well as cultural expressions. Identifying these relationships leads to a better understanding of the complex interface among written signs, symbols, language, writing, human cognition, and culture.

3.2. Writing Systems and Cognition

Beyond the impact of language, as indicated earlier, writing systems exert a fundamental effect on how we perceive and process visual information, retrieve meaning from written text, and organize incoming information in coherent ways. While it is estimated that human language or its capacity emerged about 150,000 through 200,000 years ago (Pagel, 2017), written language is a relatively recent cultural invention, which appeared just 5,000 years ago or so. The trajectory of human civilization largely correlates with the development of writing systems (see Pae, 2020). As reading and writing are fundamental cognitive skills, the development of writing systems has significantly shaped the way we think, process information, and express our ideas and thoughts. The use of writing systems in reading and writing enhances higher-order thinking. Specifically, literacy can change our cognitive and linguistic functions, such as enhanced mental abilities, reasoning skills, imagination and creativity, improved vocabulary, and improved language skills (Pae, 2020).

The way in which literacy (i.e., reading and writing) affects our cognition can be observed in a gradient way. As reading and writing demand both immediate focus and sustained attention, our routine and prolonged reading activities enhance our abilities to engage in and concentrate on cognitive activities for extended periods. Through extended cognitive activities with literacy, abstract thinking skills are promoted given that reading inherently involves decoding abstracted written signs and the symbolic representations of spoken language and concepts. Over time, the abstraction of language facilitates the ability to organize abstract concepts in a meaningful way and to express complex ideas and their relationships in a systematic way. Similarly, analytical thinking skills can also be promoted. Writing requires organizing thoughts and ideas in a structured and comprehensible manner to make points across, which in turn fosters analytical thinking and logical reasoning. Writing encourages us to develop arguments, express ideas logically, and critically evaluate the information at hand. Relatedly, our metacognitive function can be enhanced

as the benefit of literacy, as reading and writing promote our ability to think critically about what we have read and to reflect on our own interpretations.

The use of writing systems or writing makes us overcome our memory limitations by externalizing our thoughts, ideas, and knowledge onto text. The act of externalization mitigates some cognitive burden from the brain by freeing up mental resources such that we can store and retrieve a vast amount of information efficiently. By saving our cognitive resources via writing, we can observe, analyze, and modify our thinking, resulting in our deeper insights and greater self-awareness. At the same time, writing allows us to overcome the limitations of spoken language in terms of time and space. The affordances of writing systems rise above and beyond spoken language by serving people in different localities and by traveling time through the past and future. Hence, knowledge preservation across generations and building collective knowledge across communities are possible.

3.3. Writing Systems and Culture

As much as language is inextricably linked to the speaker's culture, a writing system is closely connected to a given culture. Learning both spoken and written languages is situated within sociocultural contexts, regardless of whether it takes place at home or in classrooms. This relationship points toward the natural intersection of a writing system, cognition, and culture. Pae et al. (2021) dubbed this relationship *linguocultural cognition*, which is manifested in linguistic output, such as written narratives and speech.

With respect to the utility of writing systems, in addition to the cognition-related function at the intrapersonal level, writing systems also impact culture in a broader sense. The influence of writing systems on culture can be understood at the individual level and the societal level. Regarding the individual-level impact, writing systems allow us to record our history, traditions, and knowledge in a more long-lasting and reliable form so that we can transmit culture, traditions, and historical knowledge to the next generation. Writing systems help us not only preserve cultural identity (Proskurin, 2015), cultural heritage, and cultural continuity, but also facilitate the sharing of ideas and values across generations and regions. Due to writing, we can preserve and disseminate religious texts, scriptures, and philosophical treatises within a cultural group. We can also understand the practice and understanding of belief systems and values between cultural groups and exchange ideas and knowledge between cultures fostering cultural

interaction and cross-cultural understanding. Through these cultural exchanges and interactions, cultures influence each other and one another during the adaptation to, integration, or adoption of certain cultural traits as necessary. Writing systems have also generated literary traditions in various genres, such as poetry, fiction, nonfiction, and drama, that celebrate our values, beliefs, and philosophies, as literature is a powerful tool for expressing cultural identity, exploring societal issues, and inspiring collective minds and imagination.

With respect to the societal-level impact of writing, writing systems help standardize the language by establishing rules for grammar, syntax, and vocabulary so that people from various regions can understand one another. This standardization not only prevents language drift over time, but also enhances communication among people from different regions and further forms a shared cultural identity among speakers of the same language. In a similar notion, a writing system can be closely tied to a language group's cultural uniqueness or distinctiveness. As writing systems are a crucial part of cultural identity, a certain group's heritage can become a symbol of cultural attitudes and values as well as cultural pride. Standardization therefore can also become a source of struggle for people whose scripts are being replaced and create tension among dominating and dominated parties. Historically, there have been cultural groups who fought for the preservation of their languages and scripts. As one example, Korean people fought to preserve and promote the use of their own language and writing system in the face of the brutal history of Japanese rule from 1910 through 1945. For Korean people, their writing system, Hangul, is a symbol of their cultural identity and pride. At the heart of their capital city, Seoul, in South Korea, is a huge statue of King Sejong who invented the writing system in the 15th century to enlighten ordinary people through public literacy (see Pae, 2024).

As societies become more complex, writing systems expedite the development of governmental structures and systems. Written language becomes crucial for the means of governmental operation to run organized societies through the dissemination of codified laws, administrative records, and official documents, all of which are written using the writing system. Effective governance along with moral education through public literacy was one of the purposes behind King Sejong's invention of the Korean alphabet in Korea (Pae, 2024).

As literacy is a gateway to information acquisition, knowledge or skill set, and intellectual development, writing systems serve as a catalyst for public education. It is the writing system that allows for the development and usage of textbooks, academic materials, and learning

resources. Similarly, written language allows us to efficiently use a wide range of media and technologies. In the end, literacy skills promote economic growth at the individual level and have an economic impact at the societal level. Through literacy, not only are students prepared for college, work, career, and work, but also society witnesses increased innovation, systematic development, and economic productivity in the workforce. In contrast, when one or a few scripts are selected as the literacy tool for multilingual societies, this can disempower and displace people whose scripts are not chosen as the literacy tool. They are deprived of their literacy means for higher education, economic opportunities, and services rendered in the dominant languages. As such a displacement can also generate generation gaps, it is most likely possible that parents and children function in different scripts during the transition.

In short, the impact of writing systems on cognition, culture, history, and heritage knowledge can vary across different writing systems, as some writing systems are not only more efficient for learnability and pragmatic use, but also more conducive to certain cognitive processes than others (see Pae, 2020). The advent of digital technology and the excessive use of digital texts in the digital era are likely to introduce new challenges and opportunities for our cognition (Pae, 2020b). Overall, writing systems are powerful tools that significantly influence how cultures evolve (or are lost), interact, and express themselves as well as how cultural values and ethical principles pass down from one generation to another. They play a central role in the preservation of cultural heritage and the promotion of cultural diversity in our globalized world.

Figure 2 summarizes the relationships between script and cognition, between script and culture, and between cognition and culture. What cognition and culture entail in each domain is also provided.

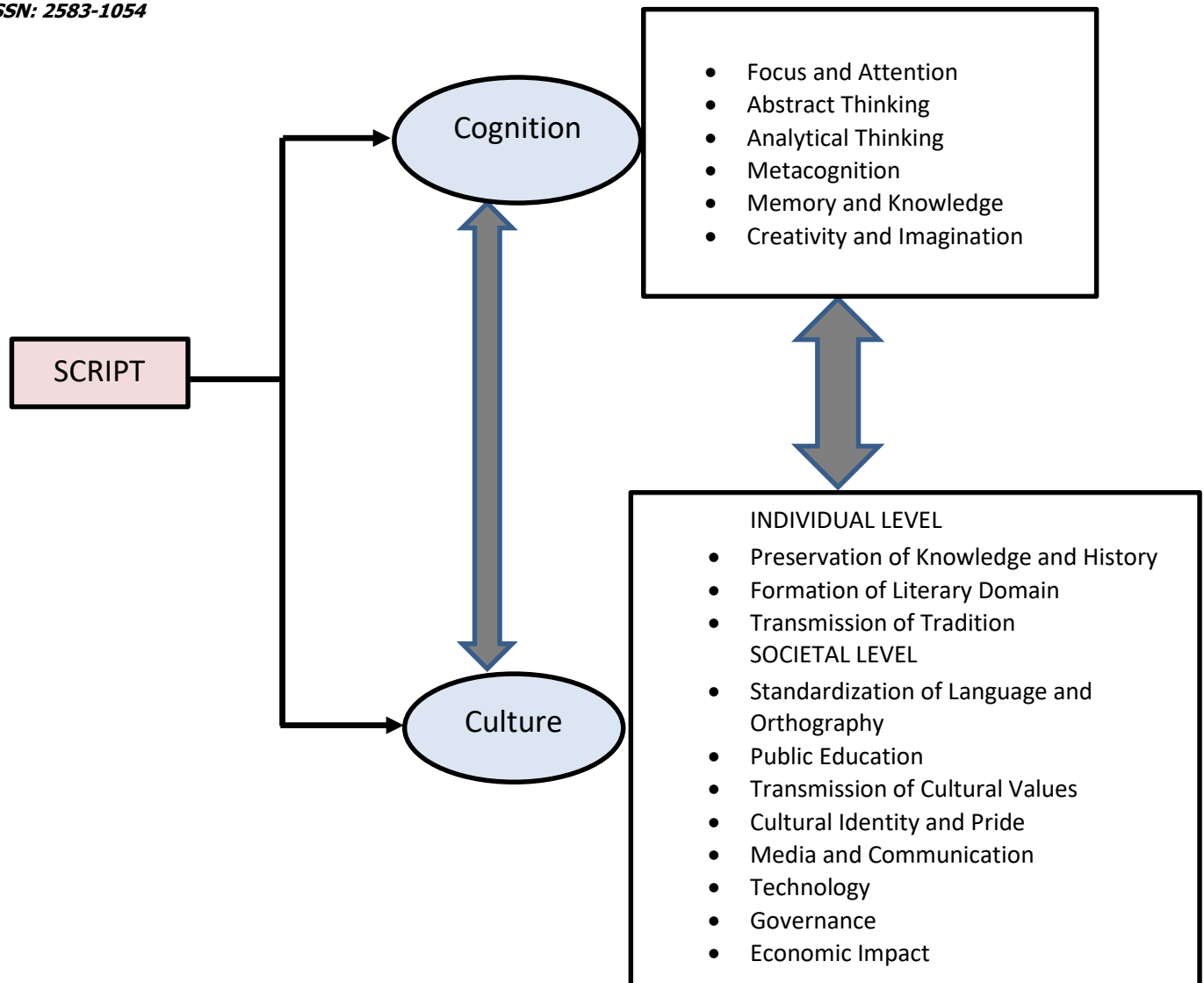


Figure 2: *Relationships among Script, Cognition, and Culture*

(Source: Authors' Own Illustration)

It is essential to recognize that the concept of script relativity is a subject of ongoing research and debate among linguists, psychologists, and anthropologists. While some studies have suggested evidence of script-specific cognitive effects, the extent and nature of these effects continue to be explored in diverse linguistic and cultural settings. The main tenet of script relativity highlights the importance of considering the influence of writing systems when examining human cognition and language processing. Script relativity has both specific and broader implications that impact various aspects of our cognition, language use, and cultural expressions.

Table 1 summarizes the specific and broader implications of script relativity to understand how writing systems shape the way we think, interpret, and communicate with other people and the world. Overall, script relativity provides valuable insights into the complex relationship among writing systems, cognition, and culture. The implications of script relativity have practical applications in education, cross-cultural communication, language preservation, and understanding the cognitive diversity of human societies. However, it is important to continue studying and exploring this area to gain a deeper understanding of the extent and nature of script-specific cognitive effects.

Table 1: *Specific and Broader Implications of Script Relativity*

Specific Implications	Broader Implications
<ul style="list-style-type: none"> • The ease and difficulty of reading • Spatial perception and mapping • Visual discrimination and memory recall • Information-processing strategies • Problem-solving strategies • Cross-scriptal transfer • Literacy teaching and learning • Digital communication and technology 	<ul style="list-style-type: none"> • Linguocultural diversity • Cultural identity • Cross-cultural communication • Educational practices • Language variations • Language preservation • Language socialization • Macro-level effects on cultural profile • Globalization with common threads

(Source: Authors' Own Illustration)

4. Augmented Script Relativity: Where Psycholinguistics and Sociolinguistics Meet

Script relativity has been primarily investigated in the area of psycholinguistics centering on individuals' scriptal processing, as it is primarily concerned with cognitive processes and mapping. However, it has the great potential to be examined in light of sociolinguistics focusing on script use or literacy in social and cultural contexts. Script relativity can be examined from a sociolinguistic approach in the context of studying how writing systems influence language use (pragmatics) and communication within social and cultural contexts. Psycholinguistics studying individual language processing and sociolinguistics studying language use in sociocultural contexts meet in the context of exploring relationships among language, writing, society, and culture. Figure 3 depicts the dynamic interface between psycholinguistics and

sociolinguistics, which allows for a more comprehensive understanding of language as a complex, multifaceted phenomenon shaped by both cognitive and social factors.

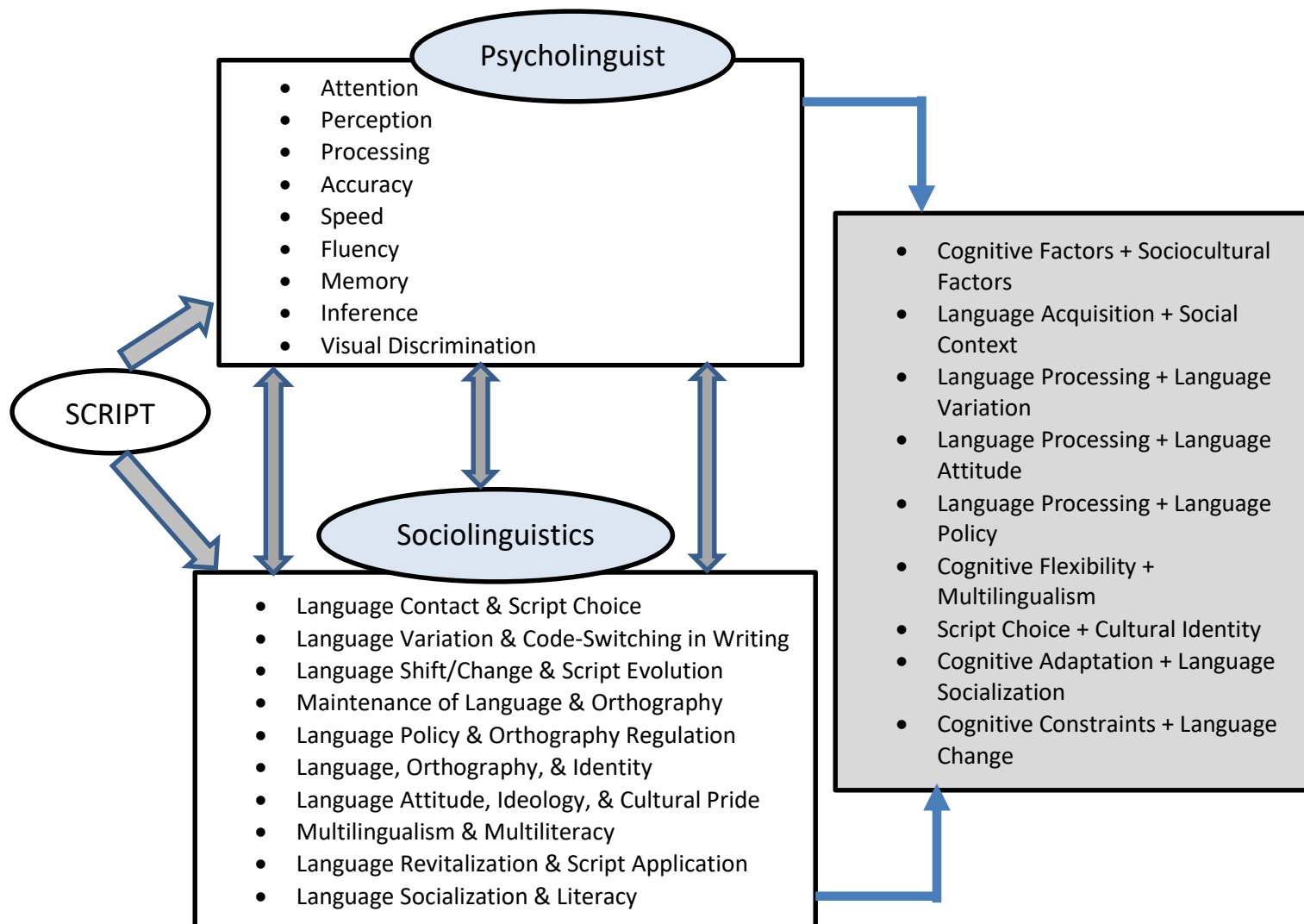


Figure 3: *Mapping a Crossroad of Psycholinguistics and Sociolinguistics Regarding Script Relativity*

(Source: Authors' Own Illustration)

Psycholinguistics examines how language and linguistic factors are psychologically processed in language acquisition and language use focusing on production and comprehension. It examines psychological mechanisms behind our attention, perception, processing, accuracy, speed, fluency, working memory, inference, visual discrimination skills, and so on. It is not surprising that script relativity has been investigated in the realm of psycholinguistics. At the same time, as spoken and written languages are socioculturally nested, it is natural that script relativity is examined from a

perspective of sociolinguistics. The key concepts that sociolinguistics covers include code-switching, language change, language ideology, language planning, bilingualism/multilingualism, and language variations (Wikipedia, 2023). The relationship between script relativity and sociolinguistics underscores the interconnectedness of language, writing, society, and culture. By considering how writing systems function within sociocultural contexts for thinking, being, and doing, we can gain a more comprehensive understanding of the complex interactions between language use and script use in diverse communities.

As Figure 3 shows, sociolinguistics can address script effects by looking at language contact and script choice, language variation and code-switching in writing, language shift/change and script evolution, language and orthography maintenance, language policy and orthography regulation, relationships among language, orthography, and identity, interactions among language attitude, ideology, and cultural pride, multilingualism and multiliteracy, and language revitalization and script application. When the approaches of psycholinguistics and sociolinguistics are merged, a more comprehensive examination and a deeper understanding can be achieved, as shown in the gray area in Figure 3.

An interdisciplinary approach of psycholinguistics and sociolinguistics extends the psycholinguistic understanding of individual language processing to the sociolinguistic interpretations of language use in social contexts. This integration provides a more comprehensive understanding of how language is acquired, used, and developed within diverse cultural and social contexts. It also helps bridge the gap between individual cognitive mechanisms and broader sociocultural influences on language and script and vice versa. The affordances provided by both psycholinguistics and sociolinguistics allow for a more holistic understanding of language as a complex, multi-faceted phenomenon shaped by both cognitive and social factors.

Other benefits of integrating psycholinguistic and sociolinguistic approaches also come into play in the context of script relativity. Code-switching, script-mixing, and new script creation (Daoudi, 2011) in writing can be examined from the perspective of linguistic expression and scriptal processing, while language contact and various social interactions by speakers of different languages are examined, especially in multilingual societies with various writing systems. An examination of script relativity in sociolinguistics underscores the interconnectedness of language, writing, and society. By considering how writing systems are embedded in sociocultural contexts, we can gain a more comprehensive understanding of the complex interactions between language

and script usage in diverse communities. Investigating language change over time in specific social contexts also helps understand how cognitive constraints can impact language drift, change, and evolution.

To incorporate script relativity into sociolinguistics, we can study how social factors influence script choices when orthographic reforms take place. Certain writing systems might be associated with specific social groups, historical contexts, or prestige, affecting the choice of script used in formal or informal communication. Sociolinguistics examines how language varies across diverse social groups and how its linguistic variations affect language use in social contexts and communication. Specifically, merging psycholinguistics and sociolinguistics can explore how language variations (e.g., dialects, registers) influence language and scriptal processing with and without controlling for cognitive factors so that overlapping and unique variances in pragmatics can be identified. Another example would be a study of whether speakers process different language varieties differently or similarly based on sociolinguistic factors.

Language shift and maintenance in communities are examined in sociolinguistics. Script relativity is relevant when studying how changes in writing systems may impact language use and influence language shift or maintenance efforts. Examining language shift processes in communities allows us to understand how cognitive adaptation occurs in response to changing sociolinguistic environments. The interdisciplinary approach allows us to explore how literacy acquisition or loss as well as reading skills are influenced by language shift and/or maintenance efforts in language communities.

Language policy, planning, and policy decisions in societies, such as the choice of scripts for official documents, education, educational materials, or media, can also be examined in the context of script relativity, as these efforts affect language use and language processing. This line of research helps us understand how social factors shape individual linguistic and scriptal processing. It also helps us understand the sociocultural and sociohistorical impacts of script policies, particularly on those whose scripts are displaced. Research can explore how education, economic, and social mobility of the population are impacted, positively and/or negatively, by such policies. Efforts and struggles with identity, culture, ideology, history, and heritage maintenance and transmission can also be studied.

Sociolinguistics explores the relationship between language and the speaker's identity, especially linguoculturally. In the context of script relativity, the writing system associated with a

language can be an essential component of cultural identity and may influence the perceptions of language, identity (e.g., the Korean example mentioned above), and language use. Integrating psycholinguistics and sociolinguistics can reveal how language and script choices contribute to the construction and negotiation of social identity, and how this, in turn, affects linguistic and scriptal processing. Such understanding can help reduce cross-cultural misunderstandings and tensions.

Sociolinguistics concerns language attitudes (e.g., linguistic overgeneralization, prestige, stereotypes, biases) and how they shape language use. Individuals' attitudes toward specific writing systems may influence script choices and perceptions of linguistic prestige or pride. These associations can be examined to explore how language attitudes impact language processing, reading, and overall communication, along with language and reading acquisition.

Sociolinguistics examines the role of bilingualism or multilingualism in societies. Script relativity can be applicable to studying how bilinguals and multilinguals navigate through different writing systems and how literacy skills are developed across multiple scripts. The integration of psycholinguistics and sociolinguistics can shed light not only on how bilinguals and multilinguals navigate between languages, but also on how code-switching is influenced by cognitive and social factors. Examining language acquisition in diverse social settings allows us to understand how sociolinguistic factors influence the development of linguistic skills in children and adult second language learners. Research can focus on how bilingualism or multilingualism enhances cognitive flexibility as well as how social factors influence bilinguals' or multilinguals' linguistic and scriptal processing.

Language revitalization efforts for endangered or dying languages are examined in sociolinguistics. Psycholinguists can investigate the cases of endangered scripts to identify psycholinguistic factors contributing to the given phenomenon as part of language revitalization initiatives.

5. Conclusion

This paper has provided a new perspective on script effects in light of the integration of psycholinguistic and sociolinguistic approaches to better understand our cognitive and cultural mapping. Language is intrinsically tied to the human mind and the speaker's culture and society. As such, the script in which we read is essentially connected with cognitive processes due to reading being a cognitive process. The script is also essentially connected with sociocultural

domains because meaning-making through text is socioculturally constructed. In this regard, this new approach has significant theoretical and methodological implications. Theoretically, the *script relativity hypothesis* is augmented to embrace the notion of cultural mapping beyond cognitive mapping. Methodologically, we call for interdisciplinary research into script effects in a manner of integrating psycholinguistic and sociolinguistic approaches.

As discussed earlier, script relativity does not argue for scriptal determinism, the idea that the writing system strictly determines thinking and cognition. It instead suggests that writing systems can influence cognition, language use, and cultural expressions, but the relationship is complex and interactive. The realm of script relativity is an area of ongoing research and debate among applied linguists, psychologists, and anthropologists. While some studies have found evidence of script-derived cognitive differences, the extent and nature of these effects continue to be explored in various linguistic and cultural contexts.

In conclusion, by merging psycholinguistics and sociolinguistics, we can gain a deeper understanding of the complex mechanism and relationships between linguistic and scriptal processing and social factors in the context of linguistic relativity. This interdisciplinary approach enables a more holistic understanding of how language and script are acquired, processed, used, and changed within diverse cultural and social contexts. It also helps bridge the gap between individual cognitive mechanisms and broader sociocultural effects on language and script.

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