# Phonological Processes and Adaption Cross Linguistic Examination: A Systematic Literature Review

**Rhosa Melani Sᵃ\***

ᵃ *Universitas Lancang Kuning, Riau, Indonesia*
*Corresponding author. E-mail address: rosamelani30@gmail.com*

## ABSTRACT

The primary objective of this study is to examine phonological processes and adaptations across various languages, focusing on their influence on language acquisition, literacy development, and second language learning. The research spans from 2019 to 2024, covering recent studies in the field. Databases such as Google Scholar and Crossref were used for the initial search, utilizing tools like Zotero and Publish or Perish. Keywords such as "phonological processes," "language adaptation," "phonological awareness," and "cross-linguistic studies" were employed." A comprehensive search across major databases, including Crossref and Google Scholar, yielded an initial 1,200 articles. Rigorous inclusion and exclusion criteria were applied, including the removal of duplicates and non-English articles, resulting in 22 articles selected for in-depth analysis. The research synthesizes findings from multiple studies to provide a comprehensive understanding of the topic. Key findings highlight that phonological awareness instruction positively impacts engagement and outcomes in language learning, especially for young learners and those learning a second language. Systematic and explicit instruction in phonological awareness has been shown to significantly improve vocabulary acquisition and speaking skills. Future research should continue exploring the most effective methods for teaching phonological awareness in diverse linguistic contexts, ensuring that all learners have the opportunity to develop strong language skills. By addressing these areas, future studies can contribute to refining educational strategies, making phonological awareness instruction more adaptable and impactful across different learning environments.

**Keywords:** Adaptation, Cross Linguistic, English Language Learning, Language, Phonological Processes, Systematic Literature Review

## INTRODUCTION

Phonological processes and adaptation are fundamental aspects of linguistic study, providing insights into how languages evolve and interact. These processes are crucial for understanding the mechanisms behind language change, acquisition, and the adaptation of loanwords. Phonological adaptation, in particular, plays a significant role in how languages incorporate elements from other languages, reflecting both phonetic and phonological constraints. This cross-linguistic examination aims to explore the various phonological processes and adaptations observed in different languages, highlighting their significance in linguistic theory and practice.

Phonological substitution, a key area of study, involves the replacement of one phoneme with another in specific linguistic contexts. Sa'aida (2020) investigates this phenomenon in Classical Arabic, revealing that adjacent phonological features significantly motivate consonantal and vocalic substitutions. This study underscores the importance of phonological

features in driving substitution processes, providing a framework for understanding similar phenomena in other languages. The findings from Classical Arabic can be compared with other languages to identify universal patterns and language-specific peculiarities in phonological substitution.

Phonological awareness, another critical aspect, is essential for language development and literacy. Sila (2021) emphasizes the importance of systematic and explicit instruction in phonological awareness for young language learners. This instruction not only improves language skills but also facilitates reading, spelling, and vocabulary acquisition in both first and second languages. The transferability of phonological awareness skills between languages highlights the interconnectedness of phonological processes across linguistic boundaries. Educators and researchers must consider these factors when developing language learning programs to ensure effective literacy development.

The development of phonological templates in children is a fascinating area of study, as explored by Vihman (2019). This research delves into the timing and function of child templates, their relation to adult templates, and their role in language acquisition. By examining phonological structures in different languages, Vihman provides a comprehensive overview of how children develop and utilize phonological templates. This cross-linguistic perspective is crucial for understanding the universality and variability of phonological development across languages

Downstepping, a specific phonological phenomenon, has been analyzed in the speech of young children by Thorson and Shattuck-Hufnagel (2020). Their study on American English-speaking toddlers reveals variations in the phonetic implementation of pitch accents, shedding light on the relationship between phonetic realizations and phonological categories. This research highlights the need for further exploration of the semantic and pragmatic meanings behind these phonetic varieties, contributing to a deeper understanding of phonological processes in child speech.

The adaptation of loanwords is another area where phonological processes are prominently observed. Sande (2019) presents a unified account of conditioned phonological alternations in the Guébie language, demonstrating how morphological, syntactic, and lexical factors influence phonological processes. This study introduces the concept of cophonologies by phase, providing a framework for understanding morpheme-specific phonology in a unified way. The adaptation of loanwords in Guébie can be compared with other languages to identify common strategies and unique adaptations.

Technological interventions in phonological awareness, as discussed by Ramos-Galarza et al. (2020), offer promising avenues for enhancing literacy skills in children with cognitive difficulties. Their study on the use of a literacy toy to improve phonological awareness demonstrates significant improvements, suggesting the potential of technological innovations in treating cognitive difficulties. This research highlights the importance of integrating technology into phonological education, providing a modern approach to traditional phonological processes.

The novelty of my systematic literature review lies in its comprehensive examination of phonological processes and adaptations across a wide array of languages, with an emphasis on their implications for linguistic theory and practice. Unlike previous research, which has predominantly focused on specific aspects such as voice onset time within code-switching contexts or phonological awareness in reading acquisition among bilinguals, my review encompasses a broader spectrum of phonological phenomena. By analyzing how these processes operate not only within single languages but also across diverse linguistic

boundaries, this study provides a more holistic understanding of phonological adaptations. Furthermore, it investigates the implications of these processes for both theoretical frameworks in phonology and practical applications in language education and speech therapy. This expansive approach highlights the intricate interplay between language-specific phonological rules and cross-linguistic influences, offering new insights that extend beyond the scope of previous studies focused on more isolated linguistic environments or specific bilingual populations (Jiexin Lin and Haomin Zhang, 2024).

## METHOD

### Search Strategy

This research employs a systematic literature review method, where the main research question was formulated as "Phonological Processes and Adaptation: A Cross-Linguistic Examination." An extensive literature search was conducted on various reputable databases such as Crossref, Google Scholar, Zotero, and Publish or Perish using keywords such as "phonological processes," "adaptation," "cross-linguistic," "phonology," and "language adaptation." Specific inclusion criteria were set, focusing on recent publications from the last 5 years that have undergone peer review. Articles that meet the inclusion criteria will undergo a rigorous selection process, initially based on their abstracts. Selected articles will then be thoroughly examined and critically appraised to extract important details regarding the methodology used, key findings, and resulting implications. The findings obtained from the researched articles will be combined into a coherent summary that presents the key findings, similarities, differences, and final conclusions. Finally, the research will be organized following the typical structure used in systematic literature reviews, including sections such as introduction, methodology, results, discussion, and conclusion.

### Study Selection

The process of conducting database searches mainly relies on platforms such as Crossref, Google Scholar, Zotero, and Publish or Perish. Furthermore, peer evaluation procedures have been applied to reduce potential bias. The search terms and their respective synonyms are detailed in Table 1. The selection of these specific keywords was based on their direct relationship to the subject of study and their significance in relation to the research topic.

Table 1. Keywords of the Search Process

| Keywords | Synonyms |
|---|---|
| **Phonological** | "phonology" or "phono" or "phonemes" or "orthoepic" |
| **Language** | "English language learning" or "Second language" or "foreign language." |
| **Adaptation** | "Adjustment" or "Transformation" |
| **Cross Linguistic** | "Comparative linguistics" or "linguistic comparison" |

Source: Authors' own conception

The selection of specific search terms and their synonyms, as detailed in Table 1, is a crucial step in this process. These keywords are carefully chosen based on their direct relevance

to the research topic and their significance within the field of study. By using well-defined search terms, researchers can effectively narrow down the vast array of available literature to those studies that are most pertinent to their investigation. This targeted approach not only enhances the efficiency of the search process but also ensures that the resulting data is highly relevant and conducive to addressing the research questions. To ensure the relevance of the articles searched to the research domain and alignment with the objectives, inclusion and exclusion criteria were carefully applied, as depicted in Table 2.

Table 2. Inclusion and Exclusion Criteria in the Data Search Process

| Inclusion criteria | Exclusion criteria |
|---|---|
| Only the Research article was written in the English language. | The research article is not written in the English language. |
| Articles with the research doing. | Articles off the topic |
| Researches published between 2019-2024. | Any researches which not lay between 2019-2024. |
| Full text is available online. | Full text is not available online. Any duplicated research articles. |
| Available in two databases Crossref and Google Scholar | |
| Studies focusing on Phonological processes and adaption | Research not directly related to Phonological processes and adaption |

Source: Authors' own conception

The table presented below illustrates the article selection process, starting with 1200 articles. In the first search, it was found that 1000 articles were retrieved from the Crossref database and 200 articles from the Google Scholar database. Next, a filtering procedure was performed using Zotero to exclude 42 duplicate articles. Furthermore, abstracts and years of publication were scrutinized to enforce the inclusion and exclusion criteria, which resulted in the removal of 549 articles that did not have abstracts and were published within 5 years or less. In addition, 26 articles were removed due to the unavailability of full-text access. In addition, 550 articles were excluded because they were not directly related to the study topic. As a result, a thorough examination of the full text began with 22 articles for further analysis.
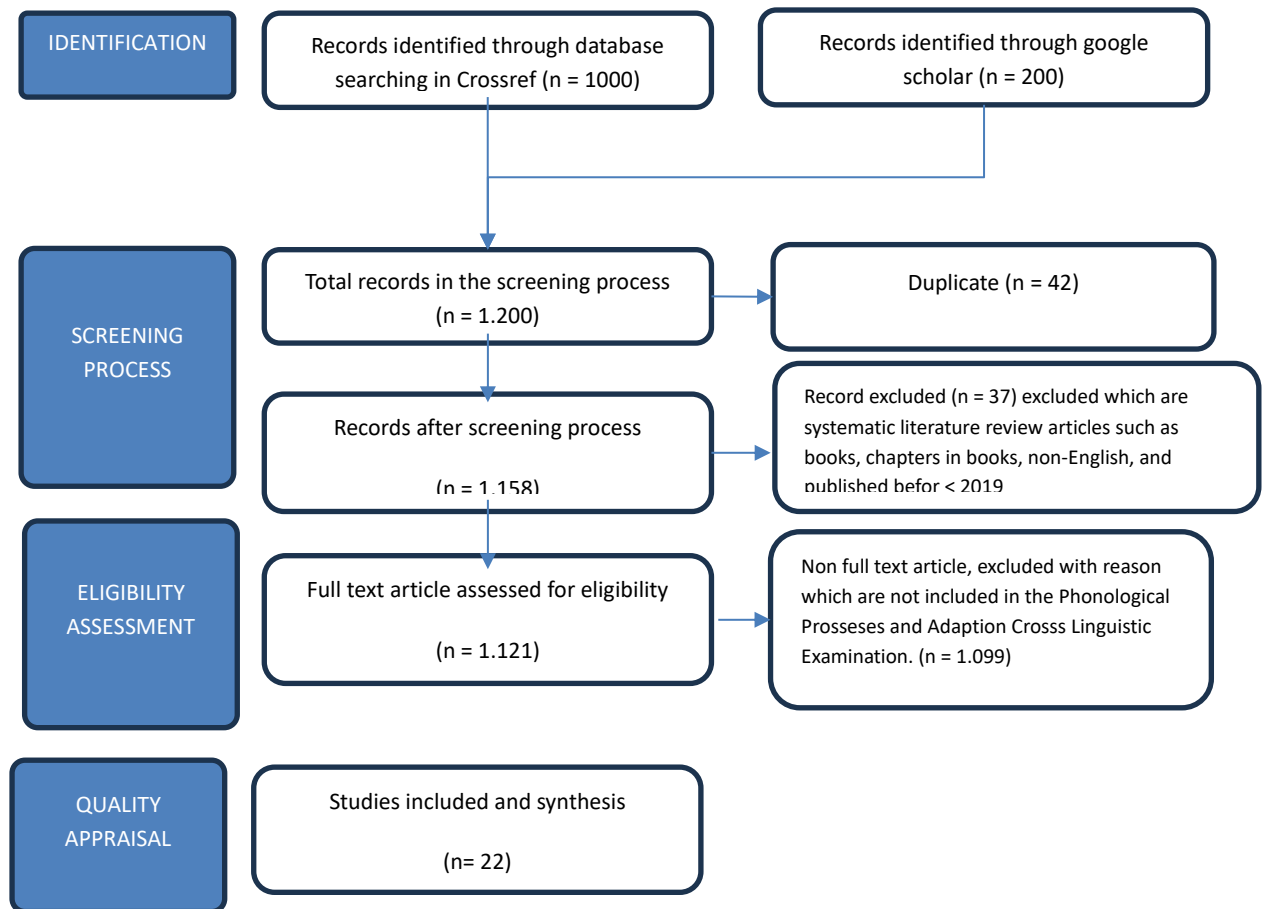
Figure 1. Article's Selection Procedures Flowchart

Source: Authors' Own Conception

**Data Extraction**

Once relevant articles have been systematically identified, the next step is to conduct a comprehensive review of the collected literature. This involves meticulously analyzing each article to extract pertinent information that aligns with the research objectives. The goal of this thorough review process is to ensure that all relevant data is captured, providing a solid foundation for subsequent analysis. By critically evaluating the methodologies, findings, and conclusions of each study, researchers can identify patterns and insights that contribute to a deeper understanding of the research topic.

Following the literature review, the data analysis phase is initiated to organize and structure the extracted information. During this phase, data is classified and grouped based on themes that are pertinent to the research investigation. These themes include examining phonological processes, understanding how cross-linguistic adaptation occurs, analyzing the phonological environment, and exploring the interaction between perception and production in phonological adaptation. By categorizing the data in this manner, researchers can more easily identify trends and relationships within the data, leading to more nuanced insights and conclusions.

The thematic grouping of data not only facilitates a more organized analysis but also highlights key areas of focus within the research. For instance, examining phonological processes might reveal how specific sounds are altered in different linguistic contexts, while cross-linguistic adaptation studies could shed light on the mechanisms that languages use to incorporate foreign phonemes. Analyzing the phonological environment and the interaction between perception and production further enriches the understanding of how phonological adaptations occur in real-world settings. This comprehensive approach ensures that the research investigation is thorough and that the findings are robust and well-supported by the systematically reviewed literature.

## FINDINGS AND DISCUSSION

**Thematic Analysis of Phonological Processes and Adaptation Cross Linguistic**
The study of phonological processes and adaptation in a cross-linguistic context reveals significant insights into how languages influence each other and adapt phonological elements. Empirical findings suggest that phonological processes are often sensitive to factors external to phonology, such as morphemes, lexical items, and syntactic domains. For instance, in the Guébie language, phonological processes are conditioned by functional morphemes, lexical class, and syntactic domains, demonstrating the complex interplay between these factors (Sande, 2019).

A key area of investigation is the adaptation of loanwords, where both production and perception play crucial roles. Studies indicate that neither production-only nor perception-only analyses can fully explain the adaptation processes of loanwords. Instead, a combined approach that considers both production and perception provide a more comprehensive understanding. This dual approach challenges traditional views that separate phonological and perceptual components, suggesting that both are integral to the adaptation process (Alice Rwamo and Constantin Ntiranyibagira, 2019)

The interaction between phonological and perceptual factors is particularly evident in the adaptation of illicit syllable structures in loanwords. For example, the choice between vowel epenthesis and consonant deletion in resolving consonant clusters depends on both phonological factors (such as phoneme category and cluster structure) and perceptual factors (such as the perceptual salience of segments), (Alice Rwamo and Constantin Ntiranyibagira, 2019). Overall, the study of phonological processes and adaptation in a cross-linguistic context highlights the intricate relationship between phonology and perception, and the importance of considering both in understanding how languages adapt and influence each other.

Table 3. General Description of the included article

| Number | Author(s) | Title | Journal | Year |
|---|---|---|---|---|
| [1] | Sande and Oakley | A typological survey of the phonological behavior | Phonological Data and Analysis | 2023 |
| [2] | Thorson and Shattuck-Hufnagel | Phonological and Phonetic Realizations of Downstep | Speech Prosody | 2020 |

| Number | Author(s) | Title | Journal | Year |
|---|---|---|---|---|
| [3] | Vihman | Phonological Templates in Development | Blackwheel | 2019 |
| [4] | Stanton | Aggressive Reduplication and Dissimilation in Sund | Phonological Data and Analysis | 2020 |
| [5] | Sande | A Unified Account of Conditioned Phonological Alternations | Phonological Data and Analysis | 2019 |
| [6] | Senowarsito and Ardini | Phonological Fossilisation of EFL Learnes: The Influence of L1 | The Southeast Journal of English Language Studies | 2019 |
| [7] | Regmi | Segmental Phonological Properties in Thakali: a typological | Gipan | 2019 |
| [8] | Hickey | Language contact and linguistic research | Wiley Online Library | 2020 |
| [9] | Shaw et al. | Revealing perceptual structure through input variation | Berkeley Linguistics Society | 2023 |
| [10] | Haket | Language Contact and the Phylogeny and Phonology of Early English | The Journal of the Undergraduate Linguistics Association of Britain | 2021 |
| [11] | Botha | Cross-Theoretical Perspective | Oxford University Press | 2019 |
| [12] | Campbell | Prominent Internal Possessors | Oxford University Press | 2019 |
| [13] | Cardoso | Language contact involving Portuguese | University of Lisbon | 2020 |
| [14] | Purnell | Variation within sound systems | University of Wisconsin-Madison | 2020 |
| [15] | Roberge | Germanic linguistics and Old Norse language | University of North Carolina at Chapel Hill | 2020 |
| [16] | Moreton | Analytic bias and phonological typology | Phonology | 2019 |
| [17] | Moreton | Under phonologization and modularity bias | Phonological argumentation: essays on evidence and motivation | 2020 |

| Number | Author(s) | Title | Journal | Year |
|--------|-----------|-------|---------|------|
| [18] | Moreton | Prosody-morphology interaction in English Diphthong Raising in a Mississippi dialect | Southern Journal of Linguistics | 2019 |
| [19] | Moreton and Pater | Structure and substance in artificial-phonology learning: Part I, structure | Language and Linguistics Compass | 2019 |
| [20] | Moreton and Pater | Structure and substance in artificial-phonology learning: Part II, substance | Language and Linguistics Compass | 2019 |
| [21] | Docherty et al. | On the scope of phonological learning: issues arising from socially structured variation | Laboratory Phonology 8: Varieties of Phonological Competence | 2019 |
| [22] | Drager | Sociophonetic variation in speech perception | Language and Linguistics Compass | 2020 |

**Effect on Vocabulary Mastery**

Phonological awareness instruction has been shown to significantly improve vocabulary mastery. Studies indicate that systematic and explicit instruction of phonological awareness (PA) in foreign languages can enhance PA skills, which in turn improves spelling, reading, vocabulary, rapid naming, PA skills, listening and reading comprehension, communication, and phonics skills (Anita Sila, 2021). This suggests that phonological awareness instruction is crucial for vocabulary development in both first and second languages.

The benefits of phonological awareness instruction extend to both first and second language learners, highlighting its universal importance in language education. By improving PA skills, learners can more effectively decode and understand new words, which enhances their ability to expand their vocabulary. This instruction is particularly beneficial in a structured and explicit format, ensuring that learners receive targeted and consistent support. Therefore, integrating phonological awareness instruction into language learning curricula is crucial for fostering robust vocabulary development and overall language proficiency.

**Influence on Classroom Participation and Academic Achievement**

Phonological awareness instruction promotes oral proficiency, which is a critical component of classroom participation and academic achievement. For instance, Spanish-speaking kindergarten children with limited English proficiency showed significant improvements in oral English proficiency following phonological awareness instruction, compared to a story-reading group. This improvement in oral proficiency can lead to better classroom participation and overall academic performance.

The impact of improved oral proficiency extends beyond language skills, fostering better classroom participation and overall academic performance. When students can articulate their thoughts clearly and understand spoken instructions, they are more likely to engage actively in classroom discussions and activities. This active participation not only boosts their confidence but also reinforces their learning, leading to improved academic outcomes. Thus, integrating

phonological awareness instruction into early education curricula is vital for supporting language development and enhancing students' academic trajectories.

**Encouragement of intrinsic motivation**

While the documents do not explicitly address intrinsic motivation, the positive outcomes resulting from phonological awareness instruction, such as enhanced vocabulary and oral proficiency, likely foster an increase in intrinsic motivation among students. As learners witness their own progress and success in mastering language skills, their confidence grows, which can lead to a greater desire to participate in additional learning activities. This sense of achievement and self-efficacy is a powerful driver of intrinsic motivation, encouraging students to engage more deeply and persistently in their educational pursuits.

Moreover, the improvements in language proficiency resulting from phonological awareness instruction can create a more enjoyable and less frustrating learning experience. When students can understand and communicate more effectively, they are likely to find learning more rewarding and stimulating. This positive reinforcement can ignite a sustained interest in language learning and academic exploration, as students feel more competent and enthusiastic about their abilities. Therefore, the benefits of phonological awareness instruction extend beyond immediate academic skills, potentially cultivating a lifelong intrinsic motivation for learning.

**Interpretation and Conclusion**

The study of phonological processes and adaptation in a cross-linguistic context illuminates the intricate relationship between phonology and perception. Loanword adaptation, which involves the incorporation of foreign words into a native language, exemplifies how both production and perception are pivotal. A combined approach that considers both aspects offers a more comprehensive understanding of how languages evolve and integrate new elements. This dual focus ensures that the nuances of phonological adaptation are fully appreciated, highlighting how sounds are not only produced but also perceived and processed by speakers.

Optimality Theory (OT) and P-Map theories provide valuable frameworks for analyzing these adaptation processes. OT focuses on the idea that language production is governed by a set of universal constraints that prioritize certain phonological outputs over others. P-Map theory, on the other hand, emphasizes the perceptual salience of phonological features, suggesting that the ease with which sounds are perceived plays a crucial role in their adaptation. Together, these theories underscore the significance of both perceptual and production factors in phonological adaptation, offering a holistic view of how languages handle the integration of foreign phonemes.

The findings from these studies underscore the importance of integrating phonological awareness instruction in language learning. Such instruction can significantly enhance vocabulary mastery, as it equips students with the skills needed to decode and understand new words more effectively. Furthermore, improved phonological awareness contributes to better classroom participation and academic achievement. By understanding the intricate processes of phonological adaptation and perception, educators can better tailor their teaching strategies to support language development, fostering an environment where students are more engaged and successful in their learning endeavors.

The exploration of phonological processes and adaptation across languages by a diverse group of researchers reveals the intricate mechanisms through which languages evolve and adapt phonetically and phonologically. Sande and Oakley's typological survey provides a

foundational understanding of how phonological behaviors vary among languages, emphasizing patterns of adaptation and change within phonological systems (Sande & Oakley, 2023). This survey underscores the importance of systematic analysis in uncovering universal principles that govern phonological adaptation.

Thorson and Shattuck-Hufnagel's investigation into phonological and phonetic realizations, particularly their focus on downstep phenomena, illuminates how phonological features are articulated and adapted in speech across different linguistic environments (Thorson & Shattuck-Hufnagel, 2020). Their findings contribute to understanding how languages maintain phonetic contrasts while adapting to new linguistic contexts Vihman's research on phonological templates in development offers insights into how children acquire and adapt phonological patterns, which are crucial for understanding cross-linguistic variation (Vihman, 2019). This developmental perspective highlights the early stages of phonological learning and adaptation, showing how children internalize phonological rules and structures from their linguistic environment.

Stanton's study on aggressive reduplication and dissimilation in Sundanese demonstrates how phonological rules operate within a specific language context, illustrating adaptive strategies that languages employ to maintain phonological regularity while accommodating new linguistic elements (Stanton, 2020). Sande's unified account of conditioned phonological alternations further explores systematic patterns of adaptation in phonological processes, revealing how languages adjust phonological structures to optimize communication and linguistic efficiency (Sande, 2019). Senowarsito and Ardini's examination of phonological fossilization among English as a Foreign Language (EFL) learners underscores the influence of first language patterns on stable phonological structures in second language acquisition contexts (Senowarsito & Ardini, 2019). This research highlights the challenges and strategies involved in overcoming fossilized phonological patterns.

Regmi's research on segmental phonological properties in Thakali contributes to typological studies, revealing how phonological systems are structured and adapted across different language families (Regmi, 2019). Such studies are essential for identifying universal principles that govern phonological adaptation and variation. Hickey's work on language contact explores how linguistic interactions shape phononogical adaptation and change, emphasizing the role of socio-cultural factors in influencing phonetic and phonological outcomes (Hickey, 2020). This socio-linguistic perspective enriches our understanding of how languages adapt phonologically in multilingual settings.

Shaw et al.'s research on perceptual structures through input variation provides insights into how listeners adapt phonological processes based on auditory input, crucial for understanding phonetic adaptation in speech perception (Shaw et al., 2023), Haket's study on language contact and the phonology of Early English offers historical insights into how phonological systems evolve over time due to language contact and cultural evolution (Haket, 2021). Botha's cross-theoretical perspective integrates insights from different linguistic theories to provide theoretical frameworks for understanding phonological processes and adaptation, offering comprehensive models for analyzing phonological variation (Botha, 2019). Campbell's research on internal possessors contributes to understanding how phonological structures evolve within languages, shedding light on historical phonological changes and adaptation (Campbell, 2019).

Cardoso's work on language contact involving Portuguese illustrates how phonological systems adapt during language contact situations, influencing phonetic and phonological outcomes (Cardoso, 2020). Purnell's study on variation within sound systems examines how

phonological variation occurs within speech communities, highlighting adaptive strategies in phonological processes (Purnell, 2020). Roberge's research on Germanic linguistics and Old Norse language provides insights into historical phonological changes and adaptation within the Germanic language family, offering a diachronic perspective on phonological evolution (Roberge, 2020).

Moreton's exploration of analytic bias and phonological typology elucidates how theoretical biases shape our understanding of phonological systems and their adaptive strategies (Moreton, 2019). Moreton's further research on underphonologization and modularity bias continues to refine our understanding of how phonological processes are analyzed and understood in theoretical linguistics (Moreton, 2020). Moreton and Pater's collaborative work on structure and substance in artificial phonology learning provides empirical evidence for theoretical models of phonological adaptation, bridging the gap between theoretical frameworks and practical applications (Moreton & Pater, 2019).

Docherty et al.'s research on phonological learning and socially structured variation explores how phonological processes adapt within diverse social contexts, revealing socio-linguistic influences on phonetic adaptation (Docherty et al., 2019). Drager's investigation into sociophonetic variation in speech perception examines how phonological variation is perceived and adapted based on social and linguistic factors, contributing to our understanding of phonetic adaptation (Drager, 2020).

These researchers collectively deepen our understanding of phonological processes and adaptation across languages, highlighting the dynamic nature of phonological systems and their adaptation strategies in diverse linguistic contexts. Their contributions underscore the interdisciplinary approach needed to comprehensively study phonological adaptation, integrating insights from phonetics, phonology, sociolinguistics, and cognitive science to advance our understanding of language evolution and communication.

## CONCLUSION

This systematic literature review has provided a comprehensive analysis of phonological processes and adaptation across different languages. The key findings indicate that phonological processes, such as substitution, assimilation, and dissimilation, play a crucial role in language adaptation and acquisition. The study's novelty lies in its cross-linguistic examination, which not only consolidates existing empirical evidence but also identifies gaps in the current research landscape, such as the need for more detailed studies on the interaction between phonological and perceptual factors. Despite the positive outcomes, the review acknowledges potential limitations, including the variability in phonological systems and individual differences in language learning, which may influence the effectiveness of phonological adaptation.

The implications of this study are far-reaching, suggesting that linguists and language educators should consider the intricate phonological processes when developing language teaching methodologies and materials. This approach could be particularly beneficial in enhancing phonological awareness and pronunciation accuracy among language learners. Future research should aim to address the identified limitations by including a broader range of languages and exploring the differential impacts of various phonological processes across diverse linguistic contexts. Overall, this study contributes valuable insights that can inform the development of more nuanced and effective phonological adaptation strategies in language education.

Based on the findings of this systematic literature review, future studies should investigate the long-term effects of phonological awareness instruction across diverse populations through longitudinal research, exploring effectiveness among different age groups and learner profiles (including students with learning disabilities and varied socio-economic backgrounds) to determine universal applicability and necessary program adaptations. Additionally, future research should examine the integration of gamification and technology-based interactive elements to address challenges such as monotony and negative emotional impacts, investigating how these approaches can enhance motivation, reduce anxiety, and improve learning outcomes while providing innovative solutions for technical and time management issues across varied educational contexts.
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