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A Morphological Analysis of Phonological Switch Points in Large Language Models-Generated English Blends

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Abstract:

Forming neologisms such as *brunch* and *smog* represents a complex example of linguistic creativity. This process involves the compression of two conceptual domains as well as the intentional manipulation of phonological, orthographic, and semantic material to produce a novel yet interpretable lexical item. With the emergence of Large Language Models (LLMs) as powerful generators of text capable of producing language often indistinguishable from that of humans, the question of whether these models can truly replicate this type of human creativity has become a central focus of inquiry. This study explores the blending capabilities of six contemporary LLMs by implementing a systematic analysis of their neologisms in comparison to those created by humans. Depending on established frameworks of word formation (WF) theory, the study investigates the phonological switch point, the juncture at which the two source words (SWs) are joined to form a new lexeme, in blends generated by LLMs. Through systematic analysis of 43 LLM-generated blends, the study identifies 14 distinct switch point types and reveals that LLMs demonstrate a clear preference for syllable boundary switches, followed by onset-nucleus boundaries and nucleus coda boundaries. The analysis shows that LLMs successfully learn and apply general phonological rules from their training data. These preferences align with those observed in human-generated blends. Furthermore, LLMs are sensitive to phonotactic constraints. They avoid splits within complex consonant clusters. These findings suggest that while LLMs can acquire sophisticated phonological knowledge through statistical learning, their approach to blend formation (BF) reflects learned patterns rather than genuine creative intuition. The study contributes to our understanding of how LLMs process morphological and phonological information, and raises important questions about the nature of linguistic knowledge in Artificial Intelligence (AI) systems.

Keywords: Blending; Large Language Models; Word Formation; Neologisms;Switch Point; Syllable.

تحليل صرفي لنقاط التحويل الصوتية في المنحوتات الانجليزية المولدة بواسطة نماذج اللغة الكبيرة

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الملخص:

يمثل تكوين الالفاظ المستحدثة مثل برانج و سموغ مثالا معقدا على الابداع اللغوي. اذ ينطوي على دمج مجالين مفهوميين الى جانب التلاعب المتعمد للمواد الصوتية والاملائية والدلالية لانتاج عنصر معجمي جديد لكنه قابل للتفسير. مع ظهور نماذج اللغة الكبيرةكمولدات نصوص قوية قادرة على انتاج لغة غالبا ماتكون غير قابلة للتميز عن لغة البشر، أصبح السؤال حول ما إذا كانت هذه النماذج قادرة حقا على انتاج هذا النوع من الابداع البشري محور تركيز مركزي للبحث. تستكشف هذه الدراسة قدرات الدمج لستة نماذج لغة كبيرة معاصرة من خلال تنفيذ تحليل منهجي للكلمات المستحدثة التي تنتجها مقارنة بتلك التي ابتكرها البشر. اعتمادا على الاطر المعتمدة لنظرية تكوين الكلمات، تبحث الدراسة في نقطة التحويل الصوتي، وهي النقطة التي يتم عندها دمج كلمتين لتشكيل معجم جديد في المنحوتات المولدة بواسطة نماذج اللغة الكبيرة. من خلال التحليل المنهجي لـ ٤٣ منحوت مولد من قبل نماذج اللغة الكبيرة حددت الدراسة ١٤ نوع متميزا من نقاط التحويل الصوتي وكشفت ان نماذج اللغة الكبيرة تُظهر تفضيلا واضحا لنقاط التحويل عند حدود المقاطع تليها حدود البداية- النواة وحدود النواة- الخاتمة. يُظهر التحليل ان نماذج اللغة الكبيرة تتعلم وتطبق بنجاح القواعد الصوتية العامة من بيانات تدريبها. وهذه التفضيلات تتوافق مع تلك التفضيلات التي يظهرها البشر في تكوين المنحوتات. علاوة على ذلك فأن نماذج اللغة الكبيرة حساسة للقيود الصوتية التركيبية. فهي تتجنب الانقسامات داخل مجموعات الحروف الساكنة المعقدة. تشير هذه النتائج الى انه بينما تستطيع نماذج اللغة الكبيرة اكتساب معرفة صوتية متطورةمن خلال التعليم الاحصائي، فان نهجها في تكوين وتوليد المنحوتات يعكس انماط متعلمة بدل من حدس ابداعي حقيقي. تساهم الدراسة في فهمنا لكيفية معالجة نماذج اللغة الكبيرة للمعلومات الصرفية والصوتية، وتثير اسئلة مهمة حول طبيعة المعرفة اللغوية في انظمة الذكاء الاصطناعي.

الكلمات المفتاحية: النحت، نماذج اللغة الكبيرة، تشكيل الكلمات، الكلمات المستحدثة، نقطة التحويل الصوتي،المقطع الصوتي.

1. Introduction

Neologisms are one of the most direct manifestations of linguistic creativity. It is defined as a newly coined word, "a word which has lost its status of a nonce-formation but is still one which is considered new by the majority of members of a speech community" (Fischer, 1998). They are described as a "response to a particular need. They are used to label denominant inventions, new phenomena, and old ideas that have taken on a new cultural context (Usevics, 2012). The study of neologisms has been a subject of linguistic inquiry since antiquity. In Ancient Rome, the grammarians and rhetoricians differentiated between words that were born and those that were coined (Duffalo, 2005). The concept of WF refers to dynamic processes by which languages continuously enrich their lexicon to meet evolving communicative needs (Algeo, 1991).

There are different word formation processes (WFPs) to create neologisms, such as compounding, derivation, backformation, conversion, borrowing, blending, and clipping, and the most common processes are those that shorten the existing words (Shahlee & Mustaffa,

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2019). Blending is one of the WFPs by which a new word is formed by merging two or more words into one. The merging words are either clipped or overlap (Lieber, 2009), for example, ***frienemy*** from ***friend*** and ***enemy***.

The rise of LLMs has raised debate about their ability to mimic human language. There are two viewpoints presented by the scholars. Some scholars state that LLMs can produce texts that closely resemble human language (Bubeck et al., 2023; Clark et al., 2021; Georgiou, 2025). In contrast, other studies showed significant differences between them (Cai et al., 2024; Georgiou, 2024; Herbold et al., 2023). This study is motivated by a core question: How do these models, which are trained on massive amounts of statistical data, handle the creative and often unpredictable processes of WF? This question is particularly pertinent in the case of blending, a WFP that has long been a subject of debate among linguists.

1.1. Problem of Study

Earlier research has focused on the formal and semantic features of blends as well as their pragmatic functions. But the emergence of LLMs has introduced new aspects or dimensions to explore, such as how these computational systems approach and process BF. A significant gap exists within the current literature, which is how these LLMs generate blends and to what extent these blends converge with, diverge from, or replicate the formal and phonological features and tendencies of human blending, the phonological types of switch points.

1.2. Research Questions

This study aims to answer the following questions:

1. What are the phonological switch points preferences in novel English blends generated by LLMs?
2. To what extent do LLM-generated blends align with or diverge from established patterns in human-created blends?

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1.3. Value of Study

Examining Blends generated by LLMs provides insights into the nature of linguistic tendencies and constraints that shape BF. By analysing the phonological switch points in LLM-generated blends, we can determine whether these systems have learned general phonological principles or are merely reproducing patterns from their training data. This investigation helps to identify both the capabilities and limitations of LLMs in handling creative linguistic tasks.

2. Literature Review

2.1. Blending as a Word-Formation Process

WF is the branch of linguistics that studies the patterns and procedures whereby new lexical units, i.e., words, are produced (Marchand, 1969). Marchand (1969) emphasises the systematic nature of WF and considers it a rule-governed domain of linguistic inquiry that can be analysed in terms of indefinable patterns and regularities. More precisely, Mathews (1991, p.37) refers to WF as the branch of morphology that deals with the relation between a complex lexeme and a simpler lexeme. Mathews' (1991) definition of WF encompasses both grammatical derivational processes and the creative formation of new words that follow existing morphological patterns. Plag's (2003) definition of WF is the processes by which new complex words are built from other words or morphemes. Harley (2006) considers WF as the process by which a new word emerges through the deliberate manipulation of established lexical forms. This field investigates the mechanisms through which new lexical items are created. Booij (2007, 2019) defines WF as a central area of morphological study that examines the smallest meaning-bearing units of language.

The classification of WFPs has been a subject of considerable scholarly debate. Marchand (1969) proposes a binary classification system that divides WFPs into two categories based on the nature of elements involved in the lexical creation. The first category includes what Marchand (1969) terms 'grammatical syntagmas', which are

ISSN (Print): 1994-8999, ISSN (online): 2664-469X. DOI Prefix: 10.36317

combinations of full-linguistic signs that are morpheme-based. This category encompasses traditional morphological processes, including compounding, prefixation, suffixation, and backformation. He characterised these processes as 'grammatical' because they are rule-governed and can be analysed through the determinant / determinatum relationship that forms what he describes as "condensed syntagmas".

Marchand's (1969) second category comprises 'non-grammatical syntagmas', which include elements that are not full linguistic signs and are not morpheme-based. This group includes processes such as clipping, expressive symbolism, blending, rhyme, ablaut gemination, and word manufacturing. These processes are distinguished by their greater irregularity and creativity. They often lack a transparent morphological structure that would permit systematic compositional analysis. This makes them more challenging to analyse using a traditional morphological framework.

Marchand's binary classification provides a helpful starting point. However, contemporary scholars have presented various refinements and extensions that address the limitation of rigid categorial distinction.

Bauer (2003) proposes an alternative approach that conceptualises morphological processes as existing on a spectrum or network rather than in discrete categories. According to Bauer's models, the most prototypical morphological processes, including affixation, backformation, and classical compounding, occupy the centre of this network. In contrast, less prototypical processes, such as clipping, blending, and acronym formation, are positioned farther from the morphological core.

Bauer's (2003) network model suggests that rather than maintaining sharp boundaries between morphological and non-morphological processes, it is more accurate to recognise that morphological processes "gradually shed off into other linguistic phenomena". This approach acknowledges that the boundaries between different types of WF are fluid rather than absolute, with some processes

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exhibiting characteristics that place them at the intersection of multiple analytical domains.

Dressler (2000) offers another influential classificatory framework that distinguishes among prototypical grammatical morphology, marginal morphology, and extragrammatical morphology. Prototypical grammatical morphology includes the traditional and reflectional processes, as well as derivational and compounding processes, that operate according to systematic rules. Marginal morphology includes phenomena such as classical and modern combining forms that exist at the boundaries between morphology and other components. Extagrammatical morphology, according to Mattiello (2013, p. 1), refers to "a set of heterogeneous formations (of an analogical or rule-like nature) which do not belong to morphological grammar, in that the processes through which they are obtained are not clearly identifiable and their inputs do not allow a prediction of regular outputs." These exagrammatical processes include blends, acronyms, initialisms, clipping, reduplication, backformation, expletive infixes, and hypocoristics.

The modern study of lexical blending owes much to the foundational work of Algeo (1977). He provided a clear and concise structural definition that has been influential in the field. A blend is a combination of two forms, with at least one being shortened in the process of combination. This definition emphasises the truncation aspect of blending and establishes a clear distinction between blends and compounds. Algeo (1977, p. 641) declares that the combinations involving full form without overlap should be classified as compounds rather than blends. Algeo (1977) himself acknowledged that, in some cases, such as meritocracy, it may be interpreted as a derivative formed with *-ocracy* or as a blend of merit and aristocracy. This highlights the idea that the line between blends and other derivational processes is blurred. Cannon (1986) highlights the telescoping nature of blends and the importance of overlapping segments. Cannon (1986, p. 730) states that a blend involves telescoping two separate forms into one, or

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superpositioning of one form upon the other. It usually contains overlapping and preserves some of the meaning of at least one of the SWs, though sometimes so much of the roots are lost that a blend is unanalysable.

Cannon's (1986) classification positioned blends as a specialised form of shortening alongside abbreviation, clipping, acronyms, and backformation. Despite characterising blends as a smaller category, Cannon (1986, p. 750) noted that "this category contains the most varied and perhaps the most structurally complex items."

Plag (2003, p. 121) defines blends as "complex words whose formation involves two or (rarely) more base words, that lose phonetic or orthographic material and are best described in terms of prosodic categories". This view was asserted by Olsen (2014, p. 46), who notes that in BF, lexemes are combined and superimposed, which leads to shortening the constituents while preserving semantic flow similar to the compounding process.

Kemmer's (2006, p. 71) study presents a cognitive perspective on BF. Blends are defined as "words that are cognitively linked to pre-existing words which are co-activated when the blend is used." The study emphasises the cognitive mechanisms underlying BF and locates lexical blending as a subtype of conceptual blending.

Other studies have focused on the meaning, sound, and conceptual nature of blends beyond structure and cognition. According to Bat-El (2006, p. 66), "a blend is one word that delivers the concept of its two base words and its meaning, thus contingent on the semantic relation between the two base words." She explores the semantic headedness of the blend. Her analysis reveals different types of semantic relationships within blends. For example, in endocentric blends such as ***skinoe***, created from ***ski*** and *ca**noe***, the ***-oe*** component from *canoe* functions as the semantic head because ***skinoe*** is a type of *canoe*. But, in exocentric blends such as ***snazzy***, from ***sna**ppy*** and *j**azzy***, neither component functions as a head, and the meaning of the blends represents a hybrid of the two SWs' meanings. Bat-El (2006, p. 67) also notes that English

ISSN (Print): 1994-8999, ISSN (online): 2664-469X. DOI Prefix: 10.36317

blends “do not show a preference for endo or exocentric relation, whereas compounds are mostly endocentric.” But she observed that endocentric blends, similar to endocentric compounds, are essentially right-headed, while in exocentric blends, the SWs maintain equal semantic status.

Not all linguists have viewed blending as a regular, systematic process. Some have characterised it as marginal and unpredictable, whereas others have placed it outside the bounds of traditional grammar.

Aronoff (1976) characterised blends as ‘oddities.’ His argument centres on the non-systematic nature of blend creation. He renders them unproductive and difficult to comprehend. Blends are constructed from fragmented and meaningless components that resist morphological analysis into recognisable morphs (Bauer, 1983, p. 234; Cannon, 1987, p. 144).

Trask (1994, p. 39) supported Aronoff’s (1976) view and described blends as formations created from arbitrary fragments of words, “chopped off and stitched together”. They are primarily employed to achieve punning effects (Ginzburg, Khidekel, & Knyazeva, 1979, p. 190). This irregularity and unpredictability of the blending contribute to its marginalisation within the traditional morphological framework.

Ronneberger-Sibold (2006, p. 157) and Dressler (2000, p. 5) define blend as “deliberate creation of a new word out of two (or rarely more) previously existing ones in a way which differs from the rules and patterns of regular compounding”. This definition positions blending outside conventional morphological grammar while acknowledging its systematic properties.

Across the various theoretical perspectives, two fundamental characteristics consistently emerge as crucial for the formation of successful English blends. These are recognisability and similarity. These are governed by a tension between two competing cognitive principles.

Many studies have shown that, for well-formed and successful blends, both SWs must be recognisable (Bauer, 2012; Gries, S. T., 2004c; Mattiello, 2013). Kaunisto (2000, p. 49) contributes to this field by

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examining the proportional contribution of the SWs to the blends. He investigates how orthographic and phonemic elements from SWs are combined. Based on Bergström's (1906) earlier proposal, Kaunisto (2000, p. 49) analysed the quantitative contribution of each segment in different blend types, proposing that deleting any items from the SWs indicates a certain degree of 'danger' or 'threat' as to the comprehensibility of the resulting blend; moreover, a typical blend would involve an overlap of the final part of SW1 and the first part of SW2 in a way to avoid deletion.

Kaunisto's (2000) analysis reveals that the shorter SW tends to contribute more significantly to the blend than LSW, helping preserve recognisability. For example, in the blend *brunch*, the word *lunch* (despite having fewer letters) contributes more than 80% to the blend than the longer *breakfast*, which contributes only 22.2%.

Bauer (2012, p. 13) observed that "it is generally accepted in the psycholinguistic literature that recognisability is easier for word beginnings than for word ends". Consequently, the prototypical structure of a blend is AD: the beginning of SW1 merges with the end of SW2. The SW1, whose beginning is preserved, is easier to access than SW2, whose end is preserved instead. Mattiello (2022, p. 32) investigated factors that contribute to SWs' recognisability, including overlap at SwiPs between SWs, semantic relationships, and contextual information referring to either SW1, SW2, or both.

The second principle is the principle of maximisation, rather than the principle of 'least effort'. The creation of new English blends appears to be a compromise between two opposing forces. On the one hand, the principle of 'maximisation' suggests that blends "allow the creator to express a single word that otherwise would formally take at least two words (Balteiro, 2013, p. 886), preserving as much of SWs as is optimal for their recognisability (Beliaeva, 2014a; Gries, 2004c).

On the other hand, blends also meet "the brain's need for denser information load by shortening certain very familiar concepts which require a shorter processing time" (Chung, 2009, p. 17). This process is

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known as the principle of 'least effort' (Zipf, 1949) and of 'linguistic economy' (Martinet, 1955), which favours the formation of new blend words that are brief, not redundant, easy to pronounce, and pleasing to the ear. Therefore, new English blends should be created as a compromise between maximising segmental input from SWs and minimising effort in production, perception, and recognition.

Although the term productive is frequently used to describe blending, which suggests it is a vital and ongoing source of new words in English. However, the precise meaning of productivity in this context is a subject of considerable debate. Mattiello (2013) discusses the phenomenon of "secreted combining forms," in which a splinter from a blend, such as -holic from alcoholic, becomes so frequently used that it acquires morpheme-like status, as in workaholic and shopaholic. Mattiello (2013) argues that these form, having lost their direct connection to the original SW, are no longer part of a blend but have become moderately productive affixes in their own right. They have become regular enough to be considered grammatical, but they are still somewhat marginal in terms of morphology. If their usage continues to grow, they could eventually become free morphemes, at which point they would no longer be part of blends (Bauer, Lieber & Plag 2013).

From its early documentation to modern linguistic analysis, the phenomenon of blending has resisted a single absolute definition. The debate among linguists has evolved from early characterisation of blends as "oddities" to sophisticated models that account for their systematic properties, such as the prototypical AD structure, phonological and semantic similarity, and the cognitive principles of recognisability and economy. Scholars have approached blending from structural, cognitive, semantic, and prosodic angles. Each contributes a piece of the puzzle.

2.2. Neologisms and AI

The rise of LLMs such as ChatGPT, Gemini, Claude, etc. has moved the boundaries of creativity and has transformed creative industries that introducing a new era in which AI systems collaborate

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with humans to produce innovative and revolutionary results (Lim et al., 2023) from "music composition" (Carnovalini & Rodà, 2020) and fine arts (Oksanen, Cvetkovic, Akin, Latikka, Bergdahl, Chen & Savela 2023) to literature (Cardon, Fleischmann, Aritz, Logemann & Heidewald 2023) and design (Zhang & Liu, 2024).

AI is an umbrella term that encompasses various methods, capabilities, and limitations, many of which are not always explicitly articulated by researchers or developers (Gillani et al., 2023). According to Anantrasirichai and Bull (2022), AI represents a kind of computational creativity that has acquired extensive attention due to its rapid development. AI offers intelligent technologies such as computer systems and computerised machines functioning and reacting as the human brain (Karsenti, 2019). Sometimes, it is known as Machine Intelligence. This kind of intelligence is displayed by machines. It aims to imitate the natural intelligence exhibited by humans. According to Wang (2019), AI comprises Natural Language Processing (NLP), machine learning, and intelligent research. Choudhury et al. (2024) state that there is an increasing demand for AI to advance expert systems that can understand certain components of human intelligence, such as language comprehension, speech recognition, visual perception, and decision-making.

The journey of language modelling began with basic statistical methods such as n-gram models (Diao et al., 2021). This model primarily relied on simple statistical techniques to predict word sequences (Brown et al., 1992). The real revolution came later, driven by the emergence of deep learning in NLP (Rawat et al., 2022), the availability of enormous public datasets (Lhpest et al., 2021), and the availability of computing devices that are needed to process this massive data (Sharir & Shoham, 2020), which led to the emergence of LLMs.

The revolutionary advancement in AI and NLP has introduced capable language models known as LLMs (Kasneci et al., 2023). LLMs are "remarkable data annotators. Their pre-training and supervised instruction fine-tuning build intelligent assistants that mimic human

ISSN (Print): 1994-8999, ISSN (online): 2664-469X. DOI Prefix: 10.36317

behaviour" (Ferrazzo, 2025). These models affected and changed the way in which humans interact with and process language. These LLMs, which depend on deep learning techniques (the Transformer architecture), are able to learn and reproduce intricate patterns and structures of a language from enormous volumes of textual data (Vaswani et al., 2017). These models can also deal with unstructured data, figure out the semantic relationships between phrases and sentences, and generate multimodal outputs such as text, image, or even sound (Li et al., 2024). Unlike humans, who develop their language within social interaction and experiential context, LLMs learn from the statistical distribution of tokens within a massive corpus of human-created text (Wu et al., 2024). The main functions of these LLMs are to predict the next word in a textual sequence (Patil, 2024). Consequently, their generated outputs might be highly accurate and coherent, but their main operation remains purely mathematical and statistical. They only produce a sequence of items based on statistical probability (Zhu, 2024).

The emergence of LLMs has offered new possibilities to generate neologisms. Academic works on how these LLMs process neologisms are scarce. Marelli and Amenta (2023) explored the abilities of ChatGPT to approach and interpret novel words. The findings showed that computational models find difficulty with low-frequency items. However, other studies revealed good performance of LLMs. Weller-Di Marco and Fraser (2024) investigate the ability of ChatGPT to comprehend morphologically complex words. These experiments on noun compounding and derivational morphology. It demonstrated that LLMs' understanding is functional but not formal. The model successfully applied generalised structural rules, such as identifying the head noun in novel compounds, which suggests an ability to generalise beyond simple memorisation. However, the model failed the critical test of distinguishing between valid and ill-formed word forms created by violating German devotional rules.

ISSN (Print): 1994-8999, ISSN (online): 2664-469X. DOI Prefix: 10.36317

2.3. Phonological Switch Points

The switch points can be defined as the place at which an SW is clipped to a splinter (Kubozono, 1990). It refers to the specific juncture within an SW where it is truncated. The resulting fragments, which are termed fracto-lexemes, are then combined to form the blend. In some works, it is referred to as the cut-off or breakpoint. The essential question that has driven decades of research is whether these SwiPs are arbitrary or if they cluster at a predictable phonological location. The consensus demonstrates that these SwiPs are far from random and show a strong preference for major phonological boundaries.

Cannon's (1986) analysis represents one of the earliest systematic corpus-driven investigations into the structural properties of English blends. Cannon sought to identify where the switch point in SW typically occurred and how the resulting segments (i.e., splinters) are fused. Cannon's corpus was 132 blends sourced from prominent dictionaries of new words. So the analysis was based on attested published neologisms rather than spontaneous or nonce formations.

Cannon (1986, pp. 726-742) identifies three primary locations for the SwiPs in his corpus. The fusing points occur at a syllabic boundary, which is the most straightforward type, where the cut occurs between two syllables, for example, *ausform* from *aus.tenitic* and *de.form*. The first part of the blend aus- corresponds to the first syllable of SW1, and the second part -form is the final syllable of SW2. The second position of the switch point takes place at a morphemic boundary, where the cut coincides with the boundary between two morphemes; for example, *alphametic* from *alpha.bet* and *arith.metic*. Cannon (1986), however, notes that morphemic boundaries almost invariably occur at syllabic boundaries. This observation led to some ambiguity, as it was unclear why this was treated as a distinct category from the first (Mohsin, 2021). The third position of switch point was non-boundary; this category contains all cuts that do not occur at a clear syllabic or morphemic boundary. That means the switch point takes place within the syllable;

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for example, splansh from spl.it and r.ansh. The splits occur between the onset and the nucleus in both SWs.

Kubozono (1990) conducted a large-scale analysis that aimed to reveal the phonological constraints on blending in English. The significance of his work lies in its large corpus. His analysis was based on a corpus of 3661 English blends, including both 61 spontaneous “error blends” and 3600 consciously formed blends from various sources. Kubozono’s (1990) most crucial finding was a phonological constraint that prohibits cut-off points from occurring within a primary syllable constituent. Kubozono (1990) argued that a cut cannot split an onset or a coda, based on which identifying three locations for SwiPs: between the onset and nucleus (peak), between the nucleus (peak) and the coda, and at the syllable boundary, which is primarily for polysyllabic SWs.

Kubozono’s (1990) study also states that the SwiPs in the two SWs are not independent. He proposed a constraint of positional symmetry: “the blended item must switch in the same syllable position such that if one word is split in a given syllable position, between the onset and the peak, for example, the other word is split in the same position” (Kubozono, 1990, p. 6), which suggests a parallel structure in the truncation of both SWs. For example, if SW1 is split to contribute its onset, SW2 must also be split to contribute its rhyme(nucleus and coda), creating a clean “swap” of corresponding parts.

Kelly’s (1998) study refined the understanding of intra-syllabic SwiPs, which he termed “breakpoints”. By analysing a corpus of 165 intentional English blends, Kelly provided additional evidence that these breakpoints are not random but “cluster at major phonological joints” (Kelly, 1998, p. 584).

Like his predecessor, Kelly (1998) found that the majority of breakpoints occur at word or syllable boundaries. However, Kelly’s (1998) primary interest was in the cases where the cut happens inside a syllable.” Kelly (1998, pp. 585-587) argued that “certain breakpoints might be favoured because they correspond with more natural phonological boundaries. The most natural and therefore most favoured

ISSN (Print): 1994-8999, ISSN (online): 2664-469X. DOI Prefix: 10.36317

intra-syllabic boundary, according to his findings, is the one between the onset and the rime. This can be illustrated with classic examples: *smog* from *sm.oke* and *fog*. The breakpoint occurs after the onset of *smoke* and before the rhyme of *fog*. In *boost* from *boo.m* and *hoi.st*, the cut occurs after the nucleus of *boom* and before the coda of *hoist*.

Hong (2004, p. 125) defines switch point as "the boundaries between the blend components". Importantly, Hong (2004) restricts his detailed analysis to non-overlapping blends to avoid the ambiguity about where the switch occurs in overlapping forms. Hong's (2004) key contribution was to categorise SwiPs by their linguistic status and then analyse their statistical distribution in a corpus of 445 English blends. Hong (2004) differentiates between morphological SwiPs, where a break occurs at a morpheme boundary, between the base and a suffix, between two base morphemes, or between a prefix and a base morpheme. For example: base+base: *earwitness* from *ear* and *eye.witness*, base+suffix: *neculeonics* from nucleon and *electron.ics*, and prefix/base *dumbfound* from *dumb* and *con.found*.

The phonological SwiPs are where the break occurs at a purely phonological juncture. Hong's (2004) analysis of 270 SwiPs revealed a clear hierarchy of preference. The data showed that BF is far from random, with the coiner strongly favouring major phonological joints as the place to make the cut. Hong's (2004, p. 128) findings were reflected in Figure 1 below.

ISSN (Print): 1994-8999, ISSN (online): 2664-469X. DOI Prefix: 10.36317

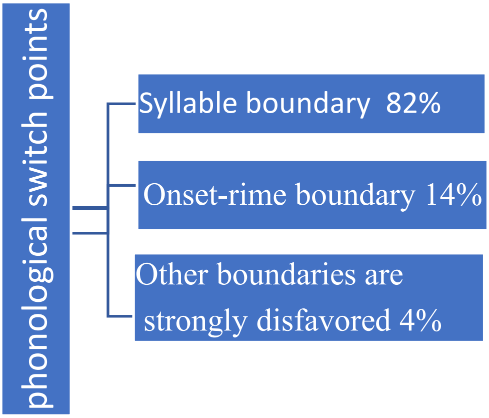

Figure 1. Distribution of Phonological SwiPs (Hong, 2004)

These disfavoured SwiPs include a break within a syllable (e.g., a body-coda boundary; ٣ cases) or within a consonant cluster (١ case). Hong's work verifies the observations of Kubozono (1990) and Kelly (1998) that SwiPs occur at major phonological junctures.

A significant evolution in the study of BF came with the work of Arndt-Lappe and Plag (2013). Their research represents a paradigm shift in both methodology and theoretical focus. They moved from the analysis of static corpora, which they considered highly biased, to dynamic production experiments and shifted the focus from purely segmental/syllabic to prosodic ones. They proposed a more powerful predictive model for switch point location, arguing for the primacy of word stress.

A central claim of earlier work by Kubozono (1990) and Bauer (2012) was that SwiPs occur at major phonological joints, with a strong preference for syllable boundaries. Arndt-Lappe and Plag's experimental data challenged the absolute nature of this constraint. While they found that most SwiPs occur at constituent boundaries, they also observed systematic exceptions, particularly in complex onsets. Their analysis

ISSN (Print): 1994-8999, ISSN (online): 2664-469X. DOI Prefix: 10.36317

showed that the constraint is not against splitting clusters per se but against creating a phonotactically illegal cluster in the resulting blends, "complex onsets in source words may variably split, and the parts may be variably recombined or deleted, as long as the resulting combinations of sounds are phonotactically legal" (Arndt-Lappe & Plag, 2013, p. 149). For example, given the pair scanner + printer, participants produced sprinter where the switch point is within the onset of SW1, and breen from b.lue and green where the switch point in both SWs takes place within the onset of both SWs. This indicates that syllabic constituents, while it is a strong tendency, are not an inviolable rule and can be overridden by other factors.

The most significant contribution of Arndt-Lappe and Plag (2013) was their hypothesis that the location of the SwiPs is essentially determined by the primary stress of SWs above all that of SW2. Their quantitative analysis of 1263 experimentally elicited blends provided overwhelming support for this hypothesis, with an error rate of only 9.1%. The relationship between the location of SW2's stress and the location of the switch point was statistically highly significant ($p<0.001$)

Renner (2019) contrasts BF in English and French. He seeks to distinguish the universal principle of blending from language-specific tendencies. Renner (2019, p. 35) analyses two datasets: 374 blends from English and 97 blends from French. Renner defines the split point as the point where the source word is cut off. According to Renner (2019), the split point might occur at five different positions.

ISSN (Print): 1994-8999, ISSN (online): 2664-469X. DOI Prefix: 10.36317

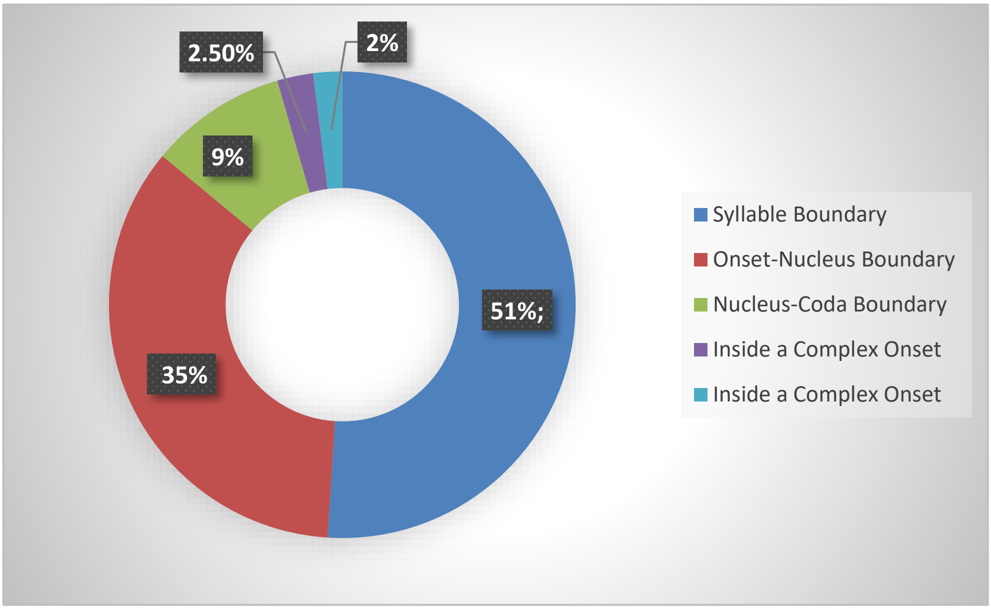

Figure 2. Distribution of Phonological SwiPs (Renner, 2019)

Figure 2 above displays the following distribution: 51% for syllable boundary, 35% for onset-nucleus boundary, more than 9% for nucleus-coda boundary, inside or within complex onset only 2.5%, and finally inside complex coda only 2%. These findings mean that English BF favours breaks at syllable boundaries or between onsets and rhymes. In a few cases, the split occurs inside or within a complex onset or coda. This supported the finding from Arndt-Lappe and Plag (2013), who argue that phonological constituents are not entirely inviolable. This finding contrasts with the French blends. French Blend favoured split points at the onset-rhyme boundary, whereas English blends favoured the syllable boundary.

The journey through these studies demonstrates a maturation in the linguistic analysis of the blend switch point. The analysis of the phonological switch point and its tendencies in this study is guided by Renner's work (2019).

ISSN (Print): 1994-8999, ISSN (online): 2664-469X. DOI Prefix: 10.36317

3. Methodology

3.1 Research Design

This study adopted a mixed-methods research design. This approach is optimal for addressing the research questions. A qualitative approach is used to answer questions beginning with Why? And how? To support and enhance the qualitative approach, the study adopted a quantitative approach to subject the data to statistical treatment to verify or refute alternative knowledge claims (Williams, 2007). For calculating the results of the analysis, the study used the percentage equation shown below:

$$\textit{The percentage} = \frac{\textit{Occurrence of tokens}}{\textit{Total number of strategies}} \times 100$$

The quantitative section involves the numerical results of each item used in the model. These numerical findings support and give precise information about the most frequently used items.

The selection of a mixed method approach is justified by the unique nature of the research questions. A purely qualitative study offers rich descriptions but would lack the systematic basis for comparing the two groups. While a purely quantitative study might identify statistical differences, it would fail to explain the underlying linguistic mechanisms driving those differences. The integration of both methods provides a more complete picture.

3.2. Data Source

The dataset in this study was generated from six prominent LLMs. This set includes:

1. OpenAI ChatGPT is chosen as the most widely used LLM. Its flexibility and general-purpose training make it an essential baseline for comparison.

2. Anthropic Claude was selected for its reported strength for producing more natural, refined, and stylistic language.

ISSN (Print): 1994-8999, ISSN (online): 2664-469X. DOI Prefix: 10.36317

3. Google Gemini is selected for its native multimodality, and its amalgamation with Google's vast data ecosystem represents a distinct architectural approach.

4. xAI Grok selected as a newer model with real-time access to social media from the X platform

5. DeepSeek AI DeepSeek was selected as an open-source model that was developed outside the USA. It showed competitive performance with other models, particularly in coding and reasoning tasks.

6. Felo Inc. Felo is an innovative multilingual search engine developed by the Tokyo-based startup

These models are selected to reflect different development organisations, architectures, training data, and specialisation. The selected models are:

To ensure the study's replicability, specific versions of the models that were used and the timeframe for data generation were documented. LLMs are subject to frequent updates that can significantly alter their behaviour. All data for this study were generated on May 14th, 2025. The following versions were used: ChatGPT-4o, Claude 3.7 Sonnet, Gemini 2.0 Pro, grok3, DeepSeek-R1, and Felo v3.

3.3. Stimuli

The experimental SWs in this study consist of 30 Iraqi collocated word pairs. These word pairs were not selected randomly, their selection was based on particular criteria. They are selected to represent different semantic domains such as food and culinary practice, kinship terms, environmental and geographical features, daily life activities and objects, as well as abstract concepts and emotions. The semantic relationships between word pairs were both syntagmatic and Paradigmatic. This diversity prevents biases that might arise from restricting stimuli to a single semantic domain. The number of syllables in each SW ranges from monosyllabic to tetrasyllabic. Gries (2004c), XDice was used to measure the orthographic similarity between the SWs.

ISSN (Print): 1994-8999, ISSN (online): 2664-469X. DOI Prefix: 10.36317

3.4. Experimental Design

The study employed a group of six LLMs as mentioned previously. One prompt is used for all models to ensure consistency. A simple, direct prompt was engineered to replicate the zero-shot condition given to the human participants. The following prompt was used:

You are engaged in a linguistic task. You will be presented with 30 pairs of English words that represent Iraqi cultural ideas. For each pair, create one blended word by combining distinctive parts of both words. Ensure the result is phonically smooth, semantically transparent, and ideally reflects Iraqi culture in its tone or connotation. Provide a short explanation describing the meaning of the new blend. Blending is a WFP where parts of two words are combined to create a new word that incorporates elements from both SWs; for example, ***breakfast*** + ***lunch*** = ***brunch***, and ***smoke*** + ***fog*** = ***smog***.

For each of the six LLMs, a new clean session was initiated. A list of stimuli was presented; each prompt was a single-turn interaction. The first response was recorded; no requests for alternatives were made. Blends generated from each model for each pair were recorded in a spreadsheet, alongside the name of the model and the SWs.

3.5. Data Analysis

An AI corpus comprising 180 responses generated by the 6 LLMs, which represent 98 types. Ten out of 98 are excluded because of the filtration process. Several types of responses were excluded for example, blends contain obvious orthographic mistakes, items that violate English phonotactic constraints (e.g., impermissible consonant cluster or syllable structure), novel items classified as compound rather than true blends, and semantic block. Consquently only 88 types are analysed. This study aims to examine the phonological switch point, the place at which the transition from SW1 to SW2 occurs in blends generated by LLMs. To achieve this goal, the study employed the framework proposed by Renner (2019), which suggests five phonological positions in which the split could occur.

ISSN (Print): 1994-8999, ISSN (online): 2664-469X. DOI Prefix: 10.36317

1. At a syllable boundary, such as ***tomaegg*** from ***to.ma***.to and ***egg***.plant.
2. At an onset-nucleus boundary such as ***brined*** from ***br***.other and f.***riend.***
3. At a nucleus-coda boundary ***snach*** from ***sna.***ck and lun.***ch.***
4. Within a complex onset ***chaolan*** from ***chao.***s and p.***lan***.
5. Within a complex coda ***lemin*** from ***lem.***on and ***min***.ts.

Only 43 blends were included in this analysis. They represent blends generated by LLMs through the clipping of both SWs or overlapping (the shared segment is treated as belonging to both SWs). Whereas (55) blends generated by clipping only one SW were excluded because the study focused on phonological switchpoint within sub-word.

4. Results

The LLMs dataset comprises 180 responses. They represent 98 distinct blend types. As a result of the filtration process, 10 types were excluded for various reasons, including spelling mistakes and failure to meet the formal criteria for blends as defined in this study. The final number of the dataset was 88 types generated by six LLMs minus 55 blends generated through clipping of one SW not both.

A quantitative analysis of the AI-GB showed a distinct distribution of phonological SwiP types. A total of 13 distinct SwiPs were identified within the AI corpus.

Table ***1*** below summarises the distribution of these types, ordered by their observed frequency.

ISSN (Print): 1994-8999, ISSN (online): 2664-469X. DOI Prefix: 10.36317

Table 1. Distribution of Phonological SwiPs in LLM-generated Blends

No.	SwiP Type	Freq	Pct	Examples	IPA
1	syllable + syllable	9	21%	*salwich*	/ˈsæl.·əd/+ /ˈsæn·.wɪdʒ/
2	nucleus coda + onset nucleus	8	19%	*plaos*	/plæ.n/ + /ˈk.eɪ·ɒs/
3	nucleus coda + syllable	6	14%	*cucugurt*	/ˈkjuː·kʌ.m·bər/+ /ˈjoʊ·.gərt/
4	syllable + onset nucleus	4	9%	*choffee*	/ ˈtʃɔ.·kə·lət/+/ˈk.ɒf·i/
5	onset nucleus + syllable	3	7%	*tomcumber*	/təˈm.ɑː·təʊ/ + /ˈkjuː·.kʌm·bər/
6	onset nucleus + onset nucleus	3	7%	*stitting*	/ˈst.ændɪŋ/ + /ˈs.ɪtɪŋ/
7	syllable + nucleus coda	3	7%	*goming*	/ɡəʊ.ɪŋ/ + /kʌ.mɪŋ/
8	syllable + complex onset	2	5%	*sitanding*	/ˈsɪt.ɪŋ/ + /ˈst.ændɪŋ/
9	complex coda + onset nucleus	1	2%	*goodads*	/ɡʊd.z/ + /b.ædz/
10	complex coda + nucleus coda	1	2%	*chippsi*	/tʃɪp.s/ + /ˈpe.psi/
11	complex onset + onset nucleus	1	2%	*spinter*	/sp.rɪŋ/ + /ˈw.ɪn·tər/
12	onset nucleus + complex onset	1	2%	*briend*	/ˈbr.ʌð·ər/ + /f.rend/
13	syllable + complex coda	1	2%	*lemint*	/ˈlem.·ən/ + /mɪnt.s/
Total		43			

ISSN (Print): 1994-8999, ISSN (online): 2664-469X. DOI Prefix: 10.36317

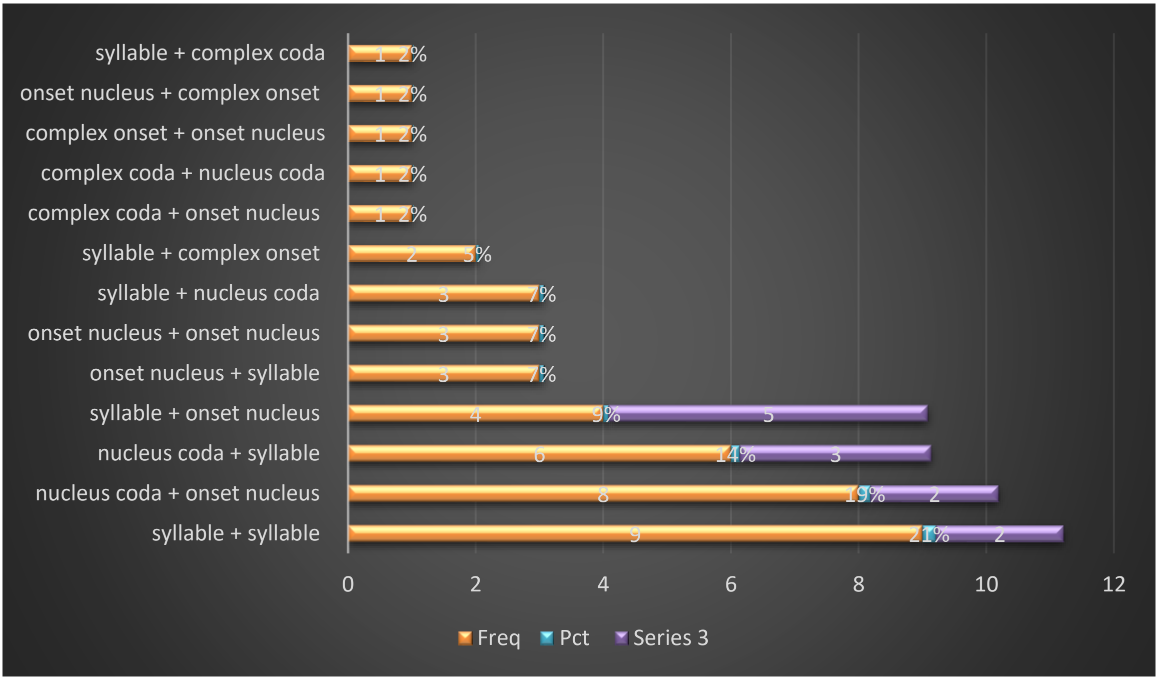

Figure 3Distribution of Phonological SwiPs in LLM-generated Blends.

Table 1 and Figure 3 show 13 distinct phonological SwiP types employed by LLMs in BF. These switch points denote the phonological boundaries at which elements or parts from two SWs are merged, and reflect varying levels of linguistic complexity and naturalness.

The frequencies and percentages of phonological SwiPs in LLM-GBs revealed significant quantitative asymmetries. Syllable-level strategies dominate the dataset, with the most frequent SwiP type syllable + syllable, accounting for 21% (n=9) of the total. This reveals that AI also favours complete syllabic transition. This is closely followed by the

ISSN (Print): 1994-8999, ISSN (online): 2664-469X. DOI Prefix: 10.36317

nucleus coda + onset nucleus strategy, which accounts for 19% (n=8) of all cases. This reflects that AI frequently performs blending at deeper sub-syllabic boundaries. Nucleus coda + syllable type ranked third, 14% (n=6). Syllable + onset nucleus accounted for 9% (n=4). Less frequent types, such as onset nucleus + syllable, onset nucleus + onset nucleus, and syllable + nucleus, account for 7% (n=3) for each.

AI corpus also revealed the presence of types that involve complex onsets or complex codas, such as syllable + complex onset 5% (n=2) and types such as complex coda + onset nucleus, complex coda + nucleus coda, complex onset + onset nucleus, onset nucleus + complex onset, and syllable + complex coda each account for 2% (n=1) for each.

The data revealed a notable preference for SwiP at broader phonological units, such as syllables, rather than sub-syllabic segments such as onsets, codas, or even complex onsets.

The analysis showed syllable + syllable as the first and the most frequent SwiP category, for example, ***salwitch*** from ***salad*** and ***sandwitch*** /ˈ***sæl.·***əd/ and /ˈsæn·.***wɪdʒ***/ in this blend, the SwiP occurs exactly at the juncture where one syllable ends, and another begins. The first part, sal- from salad, and -wich, which is the second part from SW2 sandwich, join at their respective syllable edges. This highlights that LLMs exhibit a preference for blending at maximal phonological constituents, likely because their training on vast amounts of data that prioritises the integrity of syllables as a fundamental phonological unit. The high frequency is attributed to the fact that syllable is a essentioal and fundamental salient unit of language.This behavour of LLMs suggests that they are trained on text capture and process phonological information at this important level.

At the onset nucleus boundaries where the cut off takes place between the initial consonants of the syllable and the following vowel within a syllable. This category is presented in onset nucleus + syllable and onset nucleus + onset nucleus appeared in AI blends, reflecting mergers at the onset-nucleus boundary; for example, ***tomcumber*** from ***tomato*** and ***cucumber*** /***tə*** ˈ***m.aː***·təʊ/ and /ˈkjuː·.***kʌm·bər***/ where the merge

ISSN (Print): 1994-8999, ISSN (online): 2664-469X. DOI Prefix: 10.36317

point is after the onset and before the nucleus of the first word's second syllable and before the full syllable of second SW. This implies that the onset of the second syllable is preserved and the blend occurs at the boundary where the nucleus of SW1 is followed by the onset of SW2.

Another example is ***stitting***, from ***standing*** and ***sitting*** /ˈ***st***ændɪŋ/ and /ˈs***.ɪt.ɪŋ***/, which exemplifies the category of onset nucleus + onset nucleus. This case involves the onset of the first syllable from SW1 and combines it with the nucleus and coda of the first syllable and the remainder of SW2, as shown in Figure 4 below.

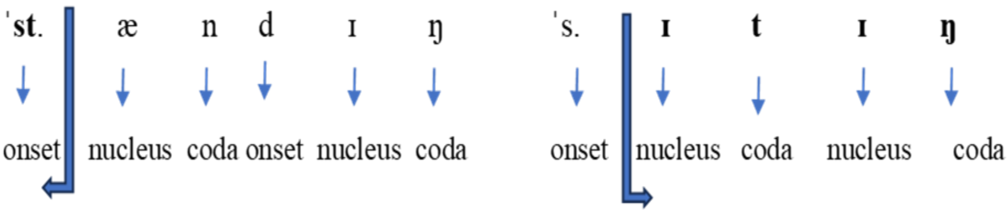

Figure 4. Phonological SwiPs in SWs of *stitting*

In both cases, the phonological cut is made after the onset and before the nucleus. This pattern might be arised because the onset and nucleus form the core of the syllable. They carry significant phonetic information for distinguishing words.

The nucleus coda boundary comprises blends cut off between the vowel of the syllable and any following consonant. The high frequency of nucleus coda + onset nucleus 19% in AI-GBs, exemplified by ***plaos*** from */plæ.n/* and */ˈk.eɪ·ɒs/* where the onset and nucleus of SW1 is preserved to combine with the nucleus and coda of SW2, exploiting overlapping as a split point. The cut is made after the nucleus and before the coda of the plan, and SW2 begins with its nucleus.

Cucughurt is an example of nucleus coda + syllable from ***cucumber*** and ***yoghurt*** /ˈ***kjuː·***kʌ.m·bər/ and /ˈjoʊ·***.gərt***/ and ***goming*** from /***gəʊ.***ɪŋ/ + /kʌ.***mɪŋ***/, is an example of a syllable + nucleus coda that also demonstrates merges at the nucleus coda boundary, albeit with

ISSN (Print): 1994-8999, ISSN (online): 2664-469X. DOI Prefix: 10.36317

different combinations of full syllables or truncated elements. These patterns indicate that AI models are adept at manipulating the internal structure of syllables to create novel forms, often prioritising a smooth transition between the two blend components.

Switch points also appeared inside or within complex onsets or codas, which are rare. For example, ***spinter*** from ***spring*** and ***winter*** /***sp***.rɪŋ/ and /ˈw.***ɪn·tər***/ is an example of a complex onset + onset nucleus category. To form this blend, the coiner chose to make the SwiP within the consonant cluster of SW1, to maintain the recognisability of the blend, and combined it with the nucleus and coda of SW2.

Chippsi from ***chips*** and ***Pepsi*** /***tʃɪp***.s/ and /ˈpe.***psi***/ is an example of a phonological SwiP type that took place within a complex coda. To form this blend, the coiner preserves the onset, nucleus, and part of the coda of SW1 and combines it with the coda of SW2, with complete exploitation of the shared phonemes and graphemes between the two SWs.

The low frequency of these types of SwiPs highlights that AI models, like humans, generally avoid splitting complex onsets and prefer to treat them as indivisible units. This could be a learned constraint from the training data and reflect the phonotactic regularities of NLs.

Table 2 belowshows the distribution of the phonological SwiP types in blends in SW1 in comparison to SW2.

Table 2. Distribution of Phonological SwiPs in SW1 and SW2 of LLM-GBs

SwiP Types	SW1		SW2	
	Freq	Pct	Freq	Pct
syllable	19	44%	18	41%
nucleus coda	14	33%	4	9%
onset nucleus	7	16%	17	40%
within a complex coda	2	5%	1	2%
within a complex onset	1	2%	3	7%
Total	43	100%	43	100%

ISSN (Print): 1994-8999, ISSN (online): 2664-469X. DOI Prefix: 10.36317

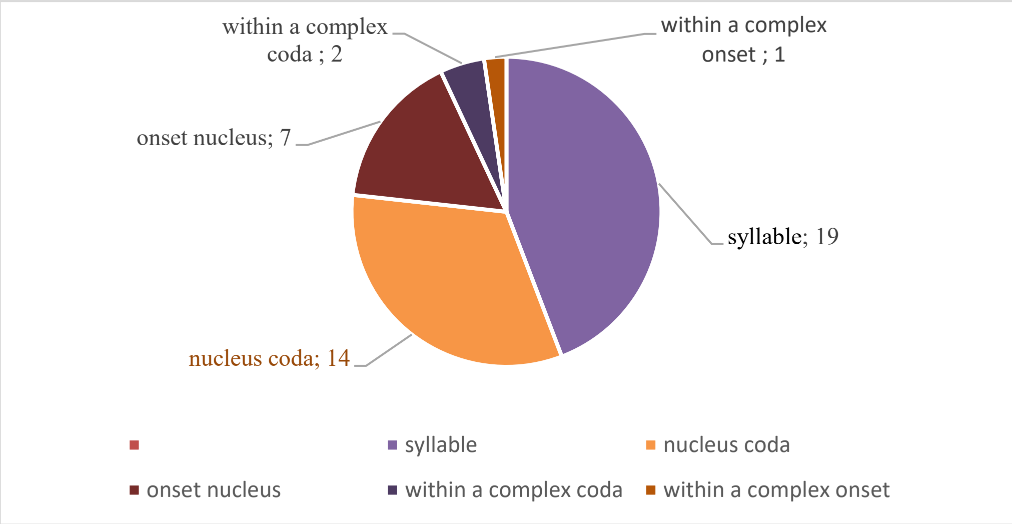

Figure 5Distribution of Phonological SwiPs in SW1 and SW2 of LLM-GBs

Table 2 Figure 5 reveal notable differences and similarities in how these two SWs contribute to the BF process. In both SW1 and SW2, the syllable level switch point constitutes the most frequent pattern, accounting for 44% in SW1(n=19) and 41% in SW2 (n=18). This finding supports prior observations in the literature. The table reveals differences in Sub-syllabic structure preference. SW1 demonstrates a higher preference for the SwiP at the nucleus coda boundary, accounting for 33% (n=14) of observed cases. This suggests that in SW1, there is retention of the beginning of the word up to the rhyme or nucleus before a switch occurs. SW2 demonstrated a higher frequency, 40% (n=17) of switch points at the onset nucleus boundary. This indicated that in blend with SW2, the beginning of the word is more likely to be introduced from the nucleus or rhyme of the syllable.

The table also revealed that switch points that occur within complex onsets or codas are rare in both SWs. They are less than 8% combined. The low frequency of these patterns suggests that LLMs are sensitive to the phonotactic constraints, likely due to statistical generalisation learned during training.

ISSN (Print): 1994-8999, ISSN (online): 2664-469X. DOI Prefix: 10.36317

Table **3** below presents the distribution of phonological SwiPs in AI-GBs in all SWs.

Table 3. Distribution of Phonological SwiPs in all SWs of LLM-GBs

SwiP Types	SW1 Freq	Pct
syllable	37	43%
onset nucleus	24	28%
nucleus coda	18	21%
within a complex onset	4	5%
within a complex coda	3	3%
Total	86	100%

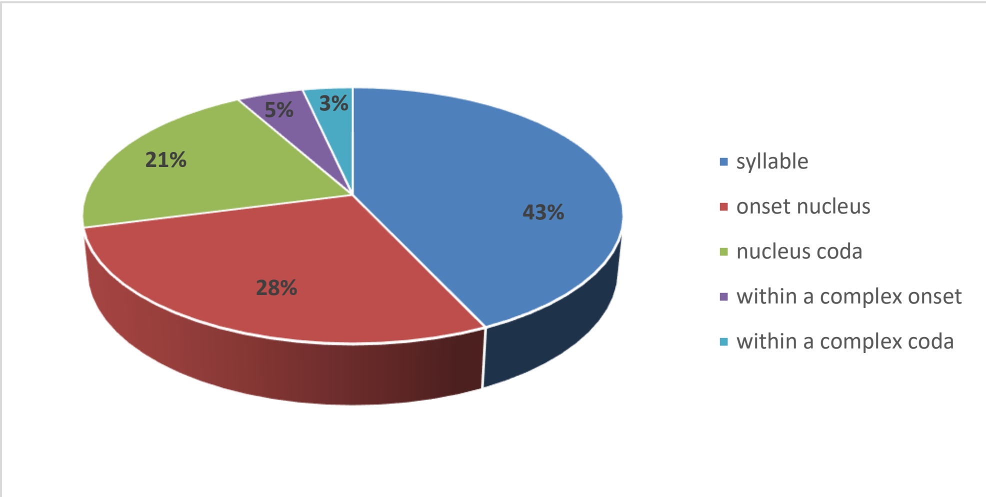

Figure 6 Distribution of Phonological SwiPs in all SWs of LLM-GBs

This table of analysis is concerned with the phonological SwiP types observed in both SWs across 86 AI-GBs to uncover overarching tendencies in how LLMs segment and recombine phonological material during BF.

As shown in Table **3**, at syllable SwiP is the most frequent pattern, 43% (n=37). This highlights LLMs' tendency to keep the whole syllable, and this aligns with human-like blending strategies that prioritise prosodic naturalness (Plag, 2003; Gries, 2012). Onset nucleus 28% (n=24) comes second, and nucleus coda 21% (n=18)

ISSN (Print): 1994-8999, ISSN (online): 2664-469X. DOI Prefix: 10.36317

comes third as SwiPs at internal syllabic boundaries. This is to maintain well-formed syllable structures, which enhances the pronounceability of the output.

Switch points within a complex coda and onset account for 8% combined. Their rarity highlights that LLMs generally have a tendency to avoid transitions that disrupt consonant clusters. This avoidance might be due to phonotactic sensitivities learned from training data.

To sum up, the analysis of the 86 novel blends showed different patterns of phonological switch points. The majority of SwiPs occurred at the syllable level; sub-syllabic transitions were also common. A small proportion of SwiPs are located within complex onsets or codas. These findings suggest that LLMs replicate human-like phonological preferences in BF because of their statistical learning from the NL data.

5. Discussion

The analysis of the phonological switch point types revealed that there are two main phonological junctures: 1) transition at syllable boundary, 2) those occurring at or within sub-syllabic constituents such as onset, nucleus, or coda.

A total of 13 distinct switch point types were identified within the AI corpus. The most frequent switch point type is syllable + syllable. This strong preference for syllable-level switch points indicates that, similar to humans, syllable boundaries are the preferred switch point even in computational WF. This finding goes in line with Kelly (1998), switch points tend to take place at "major phonological joints". This preference might stem from the underlying linguistic data that LLMs are trained on, which inherently reflects human phonological tendencies. This minimises phonological restructuring and contributes to the perceived well-formedness of blends. LLMs have learned to identify and use well-defined phonological boundaries, which leads to efficient and perceptually natural BF, because syllables are perceptually salient and psycholinguistically accessible (Lehrer, 2003; Lappe & Plag, 2013). This high frequency aligns with established linguistic research on English blends Kubozono,1990; Gries,2006 where LLMs internalise this preference from training data, replicating the human tendency to treat syllables as fundamental units of phonological processing.

The asymmetry between the onset nucleus and the nucleus coda switches can be attributed to the fact that onsets are more tightly bonded to nuclei than codas (Clements and Keyser, 1983). This makes the nucleus coda boundaries more breakable. This reflects LLMs' sensitivity to sub-syllabic structure. The higher onset-nucleus rate might arise because blending at this boundary preserves onset clusters. Because the onset and the nucleus are perceptually more noticeable than the coda, this allows the blend to retain one salient element from each SW. The onset of SW1 and the nucleus of SW2.This finding is consistent with previous research by Kelly (1998), who showed a strong preference for onset-rhyme over body-coda breaks, Bertinetto (2001), who stated three preferred SwiP types: the first preferred SwiPs at syllable boundaries, the second

ISSN (Print): 1994-8999, ISSN (online): 2664-469X. DOI Prefix: 10.36317

between the onset and nucleus, and the third between the body and the coda. Renner (2019) reported that about 50% of blends preserved syllabic constituency, and the majority of the remaining splits occur at the onset nucleus boundary.

The switch point also occurred within complex onsets and codas. The rarity of SwiP types within complex onsets/codas < 3% parallels HCBs' behaviour. These types represent more intricate phonological operations and often involve the splitting of a consonant cluster.

Breaking consonant clusters violates English phonotactics and disrupts perceptual cohesion (Berg, 1998), and this explains the low frequency of such switch point types. This goes in line with Lappe and Plag (2013: 549), who found that at least one coiner places the switch point inside or within onset clusters. This indicates that the phonotactic constraints that govern complex clusters are deeply rooted in the vast linguistic data on which LLMs are trained. It indicates that advanced LLMs, when generating novel linguistic forms, adhere to fundamental phonological principles, for example, a disfavour of splitting the consonant clusters. This adherence reflects the effectiveness of LLMs in capturing and replicating the subtle phonological regularities of natural language.

These findings contribute to a deeper understanding of how LLMs approach and generate novel linguistic forms, such as blends. AI-GBs showed that BF is not a random concatenation of two splinters from two SWs. But it is systematically formed depending on phonological principles and often reflects the statistical regularities and constraints present in their training data. Despite lacking innate grammatical intuitions, LLMs can acquire patterns that resemble human linguistic behaviour through extensive statistical learning. Further research could delve deeper into specific algorithms and training methodologies, and how they might influence BF.

6. Conclusions

The analysis of the data revealed something quite remarkable about these LLMs. LLMs have successfully learned and replicated the underlying phonological principle governing BF and avoided rather random combinations. They acquire the phonological rules of BF from their training data. Their blending tendencies in relation to the phonological switch point align closely with human patterns. They strongly prefer syllable boundaries as major split points followed by onset-nucleus and nucleus-coda boundaries. These preferences mirror those of humans. Such alignment also appears in LLMs' avoidance of awkward sound combinations. LLMs showed a tendency to create splits with complex consonant clusters, a behaviour that reflects the human tendency.

ISSN (Print): 1994-8999, ISSN (online): 2664-469X. DOI Prefix: 10.36317

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