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Cognitive Processes behind Slips of Tongue (SOTs) in Shina: Insights from WEAVER++ Model of Speech Production

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Abstract

The study explores slips of tongue in Shina language through the WEAVER++ Model of Speech Production Model by Levelt (1989). Through a corpus of naturally occurring slips of tongue, the study aims to classify types of SOTs and examine how they align with stages of Levelt's model at conceptual, formulation, and articulation levels. The systematic analysis of Shina speech errors, through the lens of Levelt's Speech Production Model, provides cross-linguistic perspectives on the potential breakdowns during planning and production stages. Moreover, identifying patterns of speech errors in Shina can inform educational and therapeutic practices aimed at addressing and managing speech related challenges; the findings will offer valuable insights for speech therapists, educators, and language learners.

Keywords:

Slips of Tongue, Shina language, Speech production, WEAVER++ model, cognitive processes, conceptualization, formulation, articulation.

1. Introduction

Slips of tongue (SOTs) are referred to as speech errors in the literature of psychology and linguistics and have long been an area of interest and investigation by psychologists, linguists, and cognitive scientists. According to psychologists, speech errors reveal our inner thoughts that we suppress to be more polite and as a 'means of self-betrayal' (Freud, 1973, p.6) and unexpressed thoughts, strong feelings, excitement and emotion of individuals (Heaton, 1982). However, for linguists and cognitive scientists, they do not reveal any hidden point (Fromkin, 1973a) (Hinter Huber, 2007) but are unintended novelties that reveal momentary malfunction of human speech production and inform how speech is organized in nervous system (Fromkin, 1973b). They are not errors of knowledge, but the errors of performance, since speakers use an unintended word or sound or misplace an intended linguistic unit in an unintended location (Garett, 2001) (Goldrick & Daland, 2009). These unintended deviations from intended utterances offer a unique window into

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the complex cognitive processes underlying speech production (Silva et al., 1976), (Mederios, 2024), (Kemmerer, 2019) (Goldrick et al., 2016), (Schwartz & Dell, 2016), (Scovel, 2005).

According to modern psycholinguistic theories of speech production, speech errors reflect breakdown in various components of speech production (Dell, 1986; Garett, 1975, 1980; Levelt, 1983; Levelt et al., 1999; Postma, 2000). Garrett proposed that speech errors occur due to disruptions at different levels of language processing: lexical, phonological and syntactic. Elaborating on this, Dell categorized speech errors based on linguistic units they affect word errors, morphemic errors, phonological errors. Levelt et al. (1999) categorized errors into four primary types: lexical errors (selection of incorrect words or substitution) morphological errors (incorrect use of morphemes, affecting affixes or word roots), syntactic errors (mistakes in sentence structure) and phonological errors (mispronunciation of words). Levelt et al. further argued that whatever is the nature of errors – semantic substitution errors, word exchange errors or sound exchange errors – they are very systematic and are governed by syntactic and phonological legality. For example, sound exchange error 'you have hissed all mystery lectures' respect the phonological structure of English (Fromkin, 1973). The classification frameworks like these facilitate systematic examination of speech errors made by Shina speakers

Shina people (people of Gilgit-Baltistan) speak the language Dardic sub-group of the Indo-Aryan family known as Shina language. Shina is spoken not only in Pakistan but also in some parts of India, including Laddakh, Dah Hanu, and Dras. It is also spoken in Jammu and Kashmir, such as Gurez, and Chanderkote. In Gilgit-Baltistan Shina language is spoken with respective dialects in valleys of Astore, Chilas, Tangir, Darel, Ghizer, Drass, Juglote, Drotte Palas, Kolai, and Kohistan. Devangari script and Urdu Arabic alphabet version are being used for Shina writings. Slips in Shina language are the errors in speech production that reorganize sounds or whole words between two or more separate words.

While speech errors have been extensively studied in English, Mandarin, Spanish and other languages, the phenomena remain unexplored in Shina. There is lack of empirical research investigating patterns, types and cognitive processes behind slips of tongue in Shina speakers. This leaves us with incomplete understanding of how speech production operates in Shina language; hence, to generalize speech production theories across languages, it is imperative to address this gap. Following research questions guides the study:

a. What kinds of Slips of Tongue (SOTs) are committed by Shina speakers?

b. What do these Slips of Tongue (SOTs) inform about the mental processes of the speakers during speech production?

This study aims to fill this gap by examining speech errors in Shina through Levelt's (1989) speech production model – that elucidates the underlying cognitive processes responsible for speech

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errors. The study is significant since it contributes to the expansion of psycholinguistic scholarship by exploring a new linguistic dimension – Shina – to the study of speech errors. This will broaden our understanding of how language production mechanisms operate across diverse linguistic contexts.

2. Literature Review

2.1 Slips of the Tongue & Speech Production Models

Levelt's Speech Production Model is a comprehensive framework that explains how humans produce speech, from conceptualizing ideas to articulating sounds. This model comprises three main stages, **conceptualization**, **formulation**, and **articulation**. Speech errors, often termed as "slips of the tongue," are viewed as breakdowns that occur at various points in this process.

1. **Conceptualization Stage**: In this first stage, the speaker formulates the idea or meaning they wish to convey. This is a pre-verbal stage where the message is constructed at a cognitive level, without linguistic encoding. Speech errors at this stage are rare, but they may involve slips where the wrong idea or concept is expressed, such as calling an object by the wrong name due to misalignment in conceptual planning (Levelt, 1989).

2. **Formulation Stage**: During this stage, the speaker transforms the conceptualized idea into a linguistic structure involving grammatical encoding (syntax) and lexical selection (word choice). In this stage speech errors are often evident as **lexical errors** (wrong word selection) or **syntactic errors** (incorrect sentence structure). For instance, the selection of the wrong word or often confusion while arrangement of words and the brain mishandles the encoding of linguistic elements (Roelofs, 1992). Moreover, Phonological errors may also occur during this stage such as anticipations or perseverations when the speaker attempts to organize phonemes and syllables into coherent speech (Levelt et al., 1999).

3. **Articulation Stage**: In this stage linguistic plan is translated into physical speech through motor commands to the vocal apparatus. This is the final stage where **phonological** or **phonetic** errors may be evident when the speaker mispronounces sounds or syllables. For example, a speaker can say "poon" instead of spoon" which reflects a failure in the performance of motor commands associated with speech sounds (Levelt et al., 1999).

Errors during the conceptualization stage reflect problems in idea generation or planning. For example, a speaker might intend to request water but mistakenly ask for tea. This shows a conceptualization problem. Furthermore, in the formulation stage, errors occur during grammatical encoding or lexical selection. These errors could involve using the wrong verb form or structure. Errors in the articulation stage arise during the physical production of speech sounds. For example, the word "Sharbat" is pronounced as "Sharabat" which would fall under the category of articulation stage.

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Speech errors are systematic and organized, not just accidental or random. These errors reveal the cognitive mechanisms in speech production. They can be categorized based on the stages of the speech production procedure where they take place. These may include conceptual errors, morphological errors, and phonological errors (Levelt et al., 1999). Moreover, D. Carroll's taxonomy of speech errors identifies eight specific types. These errors start from a shift where a speech segment starts from the intended location. Then the next is exchange where two linguistic units adjust their places. Another type is anticipation where a later segment substitutes an earlier one and maintains its original position. Perseveration occurs when an earlier segment replaces a later one and remains intact. Furthermore, an additional error involves adding extra linguistic material while deletion means omitting some linguistic elements. Substitution happens when a segment is replaced with an unintended element, on the other hand blend occurs when two intended items merge into a single expression.

The given Table 1 categorizes each type of speech error and its specific linguistic level. This classification highlights the cognitive and linguistic processes of speech production as introduced in Levelt's model.

Table 1: Mapping of Speech Errors to Linguistic Categories

Speech Error Type	Error Example	Relevant Error Category
Shift	"he dunk in the sink" → "he drunk in the sink"	Phonological
Exchange	"I wrote a mother to my letter" → I wrote a letter to my mother	Syntactic
Anticipation	"bake my bike" → "take my bike"	Phonological
Perseveration	"he pulled a pan" → "he pulled a fan"	Phonological
Addition	"I am runninged" → "I am running"	Morphological
Deletion	"I am walk" → "I am walking"	Morphological
Substitution	"fissue" → "fish" (sound); "caught" → "missed"	Phonological (sound), Lexical (meaning)
Blend	"grool" (great + cool)	Lexical

A study conducted by Postma (2000) examined how the brain monitors each speech utterance and detects or corrects speech errors in real-time. Self-monitoring throughout speech production involves associating intended speech with actual utterances. This process is sensitive and involves

various contextual factors such as cognitive load, stress, and others. For example, the frequency of speech errors rises due to high-pressure situations such as public speaking where the mind intensifies demand on the cognitive system.

2.2 Slips of the Tongue in Multilingual and Cross-Linguistic Contexts

The concept of speech errors has been widely investigated in diverse contexts and situations such as multilingual, English-speaking, and non-English-speaking. Researchers have explored whether error patterns vary or follow the same patterns across languages. For instance, Vigliocco et al. (1996) investigated subject-verb agreement errors in Spanish. They found that speakers often made errors when the subject was separated from the verb. This may reflect the sentence complexity effect during speech production. Furthermore, it was observed that morphological and syntactic errors occur more frequently as compared to English. This distinction may reflect the richer inflectional morphology of the Spanish language.

A study conducted by Wan and Jaeger (1998) in Mandarin Chinese. The findings revealed that slips of the tongue may involve tonal errors that are specifically associated with tonal languages. The study highlighted that tonal languages add a distinctive layer of complexity to speech production. Errors in tonal languages can occur at the tonal level while phonological or lexical components of speech are left unaffected. The same study conducted by Chen and Dell (2016) in Mandarin revealed that tonal speech errors occur more commonly under cognitive stress. The study suggests that speech monitoring systems function differently in tonal languages as compared to non-tonal languages.

Cross-linguistic studies may expand the concept of the structural properties of languages that influence speech production. Berg (2006) examined speech errors in German, French, and English languages. Findings of the study reveal that German speakers were more inclined to phonological errors which may be due to the complexity of German consonant clusters. While French speakers make frequent syllabic errors. One of the reasons behind frequent speech errors could be the syllable-timed nature of the French language. On the other hand, English speakers committed balanced errors such as morphemic, lexical, and phonological errors.

A Study on Dutch English bilinguals conducted by Poulisse (1999) reveals that the frequency of slips of the tongue varies and depends on the languages being spoken. The findings reveal that lexical retrieval errors are more frequent in non-dominant languages. The Errors were more frequent when the speakers switched between languages. This reflects that cognitive load and language proficiency could be the major factors in the occurrence of speech errors.

Researchers have also observed the impact of contextual features on speech errors across different languages such as formality and stress. Omen and Postma (2002) found that Dutch speakers commit more errors in formal settings as compared to casual conversations. This finding is similar to studies in English (Dell, 1986; Levelt et al., 1999) and suggests that formal context increases the possibility of speech errors.

Taha (2016) examined slips of the tongue that occur during religious and political speeches in the Arabic language. The study reveals that the chances of errors could be increased in spontaneous and unscripted discourse as compared to prepared speeches. The study highlighted the effect of speakers' emotional situations and their influence on the occurrence of speech errors such as nervousness or excitement.

El-Zawawy, (2021) believes that the production of slips of the tongue in the English language is irregular, and it was noted that substitution errors are prominent, and replacement of phonemes are also observed. According to Paradewari and Bram (2020), phonetic slips of the tongue occur more frequently than others. The study is based on frequency effects and highlighted three types of errors including anticipation, perseveration, and exchange. The study reveals four types of effects (i) lexical expectation effect, (ii) speaking rate effect, (iii) type effect (iv) location similarity effect. These four effects occurred more frequently in their research. Based on the outcomes, researchers concluded that anticipation errors occurred more often. Frequency errors were frequently found in type and speaking rate effects. In conclusion, the frequency effects that influence the slips of the tongue can be learned by the speakers. In textual pronunciation, speakers can learn to avoid slips when speaking and pronouncing words and utterances. Anticipation error occurred in their research, which means that speakers might utter a slip due to a similar word or utterance to pronounce. The speaker unintentionally made slips because of the similar sounds. Type effects often occurred because there was anticipation in the utterance.

Zulaihah and Indah (2021) examined different types of slips of the tongue in Barack Obama's interview at Axe Files. The study examines factors that cause errors in speech production using Fromkins' and Clark's theories to investigate the slips of the tongue in the audio data. The findings reveal the different kinds of errors including anticipation, perseveration, transposition, substitution, blend, and haplologies but the prominent among error the different types are substitution. Some other factors might be cognitive difficulty, situational anxiety, and social factors. In the beginning, Barack Obama speaks cautiously, and later the error occurs. They're--- they haven't quite gotten to prime age; He wanted to say he wanted to say, "they have not" but he uttered "they are". Substitution error may also be seen when he wanted to say, "when you have" instead he said, "what you don't have". Such types of errors are called substitution. Similar errors were found by Bakri (2019), his study also based on Fromkin (1973) theories of slips of tongue. He explained that speakers commit errors while adding some linguistic material in their speeches. He analyzed that the speaker said, "often historically cognate or genetically" instead of "often historically cognate genetically". In this speech the speaker should avoid –ed after the word cognate, this slip is called addition.

Berg (2020) focused on German Speech Errors as well and he collected data from other languages. He classified the data into five dimensions which highlighted the effects of errors in speech production. He believes that the distinction between inflections and derivations is not clearly drawn in language processing. Productivity makes the occurrence of errors possible, and morphological and phonological processes show considerable differences. Phonological processing is primarily a sequence problem, while morphological processing mostly struggles with issues of selection. The

study of cross-linguistics comparison reveals that some types of errors may be found in one language but not in all languages.

Hussain et al (2021) examined different kinds of slips of the tongue in Pakistan politicians' speeches and they believe that slips of the tongue occur on formal and informal occasions. They may be caused by various circumstances including anxiety symptoms, intellectual problems, and policy problems. The results reveal that slips of the tongue frequently happened in speech and addresses of Pakistani Politian including substitution, perseveration, addition, deletion, exchange, anticipation, shift, and haplology. The results indicate that Substitution is the most frequently occurring compared to other types of slips.

Syukri (2018) aims to find different types of speech errors among the 24 speeches of children during informal conversations with family members using the Indonesian language. The results show that 86 slips of tongue occurred and that were categorized into different types of errors using Harley's types (2001). The result indicates that the most frequent type of error is substitution produced by the children. Some of the children recognized their slips and made self-repairs. It occurred in certain patterns; first word replacement was made on content words or open words rather than on functional words or closed class words. Secondly, the unintended word replaces the intended word of the same category such as a noun (*lebah*) meaning 'bee' was replaced by another noun (*kupukupu*) meaning 'butterfly'.

Slips of the tongue, also known as speech errors, are common phenomena in everyday life where speakers struggle to produce their intended speech. These errors were investigated by various scholars to understand the mental processes during language production. The current study focuses on a psycholinguistic analysis of the Shina language and aims to highlight speech errors that occur during speech production. The WEAVER++ model functions as a theoretical framework to investigate speech production concepts in any language. It describes the cognitive processes involved in speech production. This involves conceptual preparation, lexical selection, syntactic encoding, and phonological encoding. The current study utilized the WEAVER++ model to investigate the phenomena of speech errors in the Shina language. This model could assist in investigating slips of the tongue that occur at different stages of speech production. For instance, errors may occur during conceptual preparation if a speaker struggles to express a concept or idea by utilizing their existing lexicon. On the other hand, errors may also occur during phonological encoding where the speaker has difficulty selecting the appropriate phonemes or syllabic form.

3. Methodology

The present study investigates SOTs in the Shina language through a descriptive qualitative approach. The research site is Gilgit Baltistan, where the Shina language is predominantly spoken. A purposive sample of 50 participants, fluent Shina speakers, were selected for the study. The participants were requested to observe their linguistic behavior and to note down instances of their SOTs through pen and paper method as suggested by Cutler (1982). Hence, naturalistic

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observations were conducted by participants for two months. A total of 19 common SOTs were found to be committed by Shina speakers in their conversations of everyday settings (Table. 2).

Table 2: SOTs in Shina

S#	Slips of Tongue	Correct Speech
1.	Thup bandh (close and shut)	Khula bandh (open and shut)
2.	shakar bish bin (sugar is bitter)	Paju bish bin (salt is bitter)
3.	Shidalu hagaar (cold heated)	Tatu hagaar (super-heated)
4.	Bai gh ro (we and he)	Bai (we)
5.	Shanus bae	Shatnus bae (on it)
6.	bodi far na bo	bodi fafar na bo (do not get so hyped)
7.	Pha mat ga dait	Phala mat ga dait (give me the apple too)
8.	Kry hin namaz (what is the time for Salah)	Kry hin class (what is the time for class)
9.	shapet wiyon	shamet shap wiyon (we will go for shap (prayer) in the evening)
10.	thai hr ranawasho han	thai hr rang nawasho han (every color of yours is unique)
11.	Rega beh (Them and we)	Bega reh (we and them)
12.	Sabunot bartan det (wash the soap with the dishes)	Bartanot sabun det (wash the dishes with the soap)
13.	Loo jo ro	ro jo loo (weeping all night)
14.	Tikit uyanu det (give hungry to the food)	Uyanet tiki det (give food to the hungry)
15.	Dor ga shor	Shor ga dor (scattered)
16.	Cooker paji shah band thet (cook the cooker and shut the meal)	Shah paji cooker band thet (cook the meal and shut the cooker)
17.	Glassae gae (glass has gone)	Glassae wae (A glass of water)
18.	Jo jo bo	Ro jo bo (keep telling)
19.	Loko loko dai dait (give me ten quickly)	Loko loko wai dait (give me water quickly)

Psycholinguistics analysis is conducted through Levelt's (1983) Speech Production Model as theoretical framework – which offers a systematic framework for understanding mental processes underlying speech production. Its three primary stages of speech production (conceptualization, formulation and articulation) are associated with four primary types of errors: lexical, morphological, phonological and syntactic (Traxler, 2019). In addition to this, the analysis incorporates Carrol's taxonymy of speech errors: shift, exchange, anticipation, perseveration, substitution, blend (Bakri, 2019). Each type of error relates to the linguistic level mentioned above and each error is mapped to the relevant stage of speech production – blend, substitution and exchange are lexical errors that occur at the conceptualization stage; addition and deletion involve incorrect use of morphemes and occur at formulation stage; shift, anticipation, perseveration and substitution are phonological errors and occur during articulation stage. This classification of framework facilitated a systematic analysis of SOTs by Shina speakers.

4. Data Analysis and Discussion

During data collection, the researchers found 19 slips of tongue in speakers' conversations. The types that occurred in their speech were anticipation, preservations, reversal/exchange, blend/haplologies, mis derivations/shifts, substitutions, additions, and deletions.

4.1 Classification and Categorization of Slips of Tongue (SOTs) in Shina

The first stage of data analysis included categorization of SOTs into the linguistic levels they belonged to. Since each linguistic level corroborate with different stage(s) of speech production (Levelt, 1999), the date is further is mapped onto three stages of speech production as follows: conceptualization – lexical level; formulation – morphemic & phonemic levels; articulation – phonological level. This categorization and mapping allowed for a systematic and comprehensive understanding of the types of errors made by the speakers (Table 3).

Table 3: Classification & Mapping of SOTs

Linguistic Category of Error	**Category of Speech Error & Explanation**	**Example from Data**	**Stage of Speech Production (Levelt, 1999)**
Lexical	**Exchange/Reversal** **[**In this type of slip speaker often substitutes one word with another. A word exchange happens when a word appears in one position and is	***Cooker*** paji ***shah*** band thet (cook the cooker and shut the meal) → **Shah** paji **cooker** band thet (cook the meal and shut the cooker) ***Dar*** gai ***shor*** → **Shor** ga **dor** (scattered) *Tikit uyanet* det (give hungry to the food) → **Uyanet tiki** det (give food to the hungry)	**Conceptualization**

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	produced in a different position.**]**	*Rega beh* (Them and we) → **Bega reh** (we and them) *Sabunot* bartan det (wash the soap with the dishes) → **Bartanot** sabun det (wash the dishes with the soap) *Loo* jo ro (will weep from morning) → **ro** jo **lo** (weeping all night)	
	Substitution [the speaker utters a word that might be wrong however it would be related to the intended word]	***Thup*** bandh (close and shut) → **Khula** bandh (open and shut) ***shakar*** bish bin (sugar is bitter) → **Paju** bish bin (salt is bitter) ***Shidalu*** hagaar (cold heated) → **Tatu** hagaar (super-heated)	
	Blend or haplologies [two linguistic units are combined into one word while speaking]	***shapet*** wiyon → shamet shap wiyon (we will go for shap (supplication) in the evening) thai hr ***ranawasho*** han → thai hr rang nawasho han (every color of yours is unique)	
Morphological	**Deletion** [linguistic material is omitted at different levels including phonemes clusters, syllables, words, and phrases]	*bodi* ***far*** *na bo* → *bodi* ***fafar*** *na bo* (do not get so hyped) ***Pha*** mat ga dait → **Phala** mat ga dait (give me the apple too) *Shanus* bae → **Shatnus** bae (on it)	**Formulation**
	Addition [inclusion of one or more sounds, syllables, or words that were not part of the speaker's intended message]	Bai gh ro (we and he) → Bai (we)	

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Phonological	**Anticipation** [when a later segment takes the place of an earlier segment]	Loko loko ***dai*** dait (give me ten quickly) → Loko loko **wai** dait(give me water quickly) ***J***o jo bo → **R**o jo bo (keep telling)	**Articulation**
	Perseveration [when the initial consonant of the latter word is exchanged for the initial consonant of the first word]	Glassae *gae* (glass has gone) → Glassae **wae** (a glass of water)	
	Misderivation [these errors occur when a speaker's intended word is replaced by a new word]	Kry hin ***namaz.*** (what is the time for namaz) → Kry hin ***class***. (what is the time for class)	

4.1.1 Lexical errors

Exchange/Reversal

This type of error occurs when a speaker substitutes one word for another, by switching the positions of two words in a sentence. The findings of this study indicate that reversal is the most prevalent type of slip of the tongue among Shina speakers. For instance, in the sentence "*shah paji cooker band thet",* the intended word "*shah"* was replaced with "*cooker".* This error occurred due to the exchange of positions or words. The word '*shor*' was replaced with '*dor'*, which comes after in correct production this may cause of slip of the tongue in the language. Additionally, the speaker using 'Tikit' instead of 'Uyanet' leads to a reversal/exchange error. Moreover, the researchers observed that speakers may also substitute different words in a single sentence. For instance, "*Rega"* was used instead of "*Bega", "Sabunot*" was used instead of *"bartanot",* and "*loo*" was used instead of *"ro"* as a result slips of the tongue occurred. It is also observed that such errors may reflect deeper cognitive processes that are involved in the production of speech in everyday life. The unique linguistic features of Shina such as the presence of homophones may contribute to the occurrence of reversal errors. It is observed that 'reversal' occurs more frequently as compared to others in the collected data.

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Substitution

When a speaker substitutes an intended word with an unintended word during speech production, a substitution error occurs. In the collected data, three instances of substitution errors were identified among the slips of the tongue in Shina speakers. These errors happen when a speaker replaces one word with another, and the intended word may not be relevant to the speech. For example, "*thup*" was used instead of "*khula," "Shakar*" was used rather than "*Paju*," and "*Shidalu*" was uttered instead of "*Tatu*." Furthermore, the researchers observed that substitution errors were particularly noticeable. These types of errors can be common in spontaneous speech especially when the speaker is engaged in multiple activities or under stress. The underlying causes of these errors can be attributed to various factors such as exhaustion, distraction, speaking hastily, and lack of concentration.

Blend

In blend or haplologies two linguistic units are combined as one word while speaking. This may reveal that when a speaker intends to produce a sentence quickly, they might combine two words and make a different sound. According to Fromkin, a blend occurs when speakers combine two linguistic units into a single word while speaking. This type of error is thought to occur when a speaker wants to say a sentence quickly and combines two words in a sentence to create a new sound. In this research, the researcher found that speakers in their speech used "*ranawasho*" and "*shapet*" by combining two words "*rang nawasho*" and "*shamet shap."* These utterances are an example of blend or haplologies, which is a type of speech error that occurs when a speaker mixes two words in a sentence. The researcher also found that slips of the tongue in this study occurred in various contexts that involved pauses due to respiratory and hesitation, repetition, and some speech errors that happened in the phonetic, syllable, and word level. It results in the practice of content shifts on locus attention during speech production planning.

4.1.2 Morphological errors

Deletion

In the context of speech errors, deletion refers to the omission of one or more sounds, syllables, or words from a speaker's intended message. This can happen when a speaker's intended message is incorrectly derived from the mental representation of the message in the speaker's mind. Deletions can result in speech errors such as phonological reduction, where sounds are omitted, or syntactic reduction, where words or phrases are omitted. Research on speech errors shows that speakers sometimes replace one word with another. This can lead to a different or unexpected message being conveyed. In the case of the Shina language, it was observed that speakers utter "*pha*" instead of "*phala"* and "*far*" instead of "*fafar*." This may be occur due to the deletion of some linguistics elements, however, the intended meaning was still conveyed although deletion occurred. From

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both instances it is noticed that the speakers omitted linguistic material at the phonemic level. Specifically, in the word "*phala*," the last phoneme "la" was omitted during speech. Similarly, in the word "*fafar*," the initial phoneme "*fa*" was omitted during speech production. In another slip, the researchers found that the speaker deleted the/t/ sound in this phrase instead of saying "*shatnus*" the speaker said "*shanus*". This indicates that deletion plays an important role in the speech errors that occur in the Shina language

Addition

In this slip, the speaker said "bai gh ro" which means "we and he" but what actually speaker needed to say is "bai" which means "we". In this case, the speaker did an error while adding some linguistic material to his speech which is called addition. A similar error was found by Bakri (2019), his study was also based on Fromkin (1973) theories of slips of the tongue. He explained that the speaker commits an error while adding some linguistic material to their speeches. He analyzed that the speaker said, "often historically cognated or genetically" instead of "often historically cognate genetically". In this speech, the speaker should avoid –ed in the word cognate.

In the context of speech errors, addition refers to the inclusion of different elements during the production of speech. This may include one or more sounds, syllables, or words that were not part of the speaker's intended utterance. This can happen when a speaker's intended production is mixed with some unintended linguistic material. As a result, different errors occur, such as word repetition, phrase repetition, or the inclusion of an extra word or sound. For example, the speaker made an error by adding extra linguistic material to their speech as a result an incorrect phrase emerged, such as "*bai gh ro,"* which means "*we and he*" instead of the intended "*bai"* which means "*we*". This type of error is called an addition because the speaker added an extra word to their speech. This error is often caused by different factors such as attentional issues, or the influence of similar-sounding words in the speaker's environment

4.1.3 Phonological errors

Anticipation

Anticipation is when a later segment takes the place of an earlier segment. It can be noticed that both the segments differ from one another, but later segments interfere at first and thus it is used twice. In this speech, it could be noticed that the speaker committed speech error due to the time pressure because in the Shina language "***loko loko***" means "quickly" with the repetition of the same word speaker stressed the first word "***loko"*** to ensure he needed it urgently as a result speech error occurred. This error may be indicative of situational anxiety on the part of the speaker, as the phrase "*loko loko*" in Shina translates to "hurry up". This suggests that the speaker was in a rush and needed something urgently, leading to the replacement of the later segment with the earlier one.

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Fromkin mentioned anticipations in his study as speakers might say "it's a meal mystery" instead of "it's a real mystery". The results indicate that the Shina language contains the same slips just like other languages in the world. In another example, /dz/ sound occurred at the beginning of "***ro***" in his pronunciation during speech. The speaker intended to say "***ro jo***" which means "keep saying" but he said "jo jo" which shows later segment takes the place of the earlier one.

Perseveration

The cause of these types of errors is when the initial consonant of the latter word is exchanged for the initial consonant of the first word. In perseveration, it is noticed that phonemes having similar resemblance and representation in the same semantic field contribute to slips. The findings of this research indicate that there was one error that was classified as a perseveration type. This error occurred when the speaker repeated a unit of speech, instead of using the intended unit. An example of this type of error can be seen in the pronunciation of "*glassae wae",* where the speaker pronounced it as "*glassae gae".* Instead of using the correct unit "*wae",* the speaker replaced it with "*gae*". This is in line with Fromkin's definition of perseveration as the repetition of a unit of speech, instead of using the intended unit. This type of error is considered as perseveration.

Misderivations

Misderivations are a type of speech error identified by Fromkin in her model of speech production. According to her, these errors occur when a speaker's intended word is replaced by a new word, resulting in an incorrect or unexpected message. In an instance of this speech production by speakers of Shina, the researcher found that the speaker said ***namaz.*** The target word he wanted to say is ***class***. The speaker substituted ***namaz*** with ***class*** but the interesting point the researcher observed is that in these slips' speakers replaced nouns with nouns. **Namaz** is a noun in the Shina language similarly the word class is also a noun. These errors are thought to occur when a speaker's intended message is incorrectly derived from the mental representation of the message in the speaker's mind. This can happen when there is a problem with the process of selecting and organizing the words and sounds that make up the message.

As stated by Dell (1986), a slip of the tongue is a type of speech error that occurs when a speaker unintentionally utters a word that is different from the intended word. This error is caused by a failure in the speaker's planning or execution of the intended message. Based on this definition the phenomenon of a slip of the tongue also occurred among the Shina speakers they expressed words are not suitable with the intended words. The phonological encoding stage is identified as a crucial stage in accurately conveying the speaker's intended message to the listener, and errors at this stage can result in confusion or misunderstanding. This can also show the construction and organization of the mental lexicon during the production of speech.

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4.2 Mental Processes and SOTs

Willem Levelt's production theory known as the WEAVER++ model suggests that the process of speech production involves a series of cognitive and neural stages. These stages begin with the activation of a concept or idea and conclude with the activation of the corresponding speech sounds. It is pertinent to note that the activation of a concept does not automatically lead to the activation of speech sounds. It further requires modifying the concept in different stages. The WEAVER++ model provides a comprehensive description of the steps and processes that occur between the activation of a concept and the activation of the corresponding speech sounds. These include various stages such as lexical access, morphological encoding, phonological encoding, phonetic encoding, and articulatory control. Each stage serves a specific sub-goal in the overall process of speech production. The output of one stage serves as the input for the next stage and ultimately leads to the activation of the appropriate speech sounds.

Lexical selection involves mapping words or other linguistic units to their corresponding phonetic representations such as words "*fafar*" and "*Phala"* in Shina language would be mapped to the phonetic representation. After this stage the process further moves towards next stage which is a morphological encoding which deals with the relationship between the meaning and the form of words, it examines the word structure and its meaning. In this level words "*fafar*" and "*Phala"* are structured, and their meaning is also examined. Once morphemes of targeted words are activated then it shifts to the next level which is phonological encoding: This stage involves converting the phonetic representation of a word into a representation of the sequence of phonemes (i.e., the basic units of speech) that make up the word. Where in this stage slips of tongue may be formulated because the words "*fafar*" and "*Phala"* contain two phonemes of *"fa"* and *"far"* and "*Pha" and "la"* respectively, whereas in this stage first phoneme "*fa"* of the word "*fafar*" has been omitted as in "*Phala"* the last phoneme *"la"* also omitted where errors generated. The selected phonemes are further transferred to the next stage phonetic encoding. This stage involves the mapping of phonemes, which are the abstract units of sound in a language, into the specific sounds that are produced by the vocal tract. Now the selected words became *"far"* and "*Pha"* at this level. Furthermore, moving to the next stage vocal tract for the words *"far"* and "*Pha"* muscles movements, the position of the tongue, jaw, lips, and other parts of the vocal tract are organized according to the selected words.

When a speech is produced it involves two different systems. The first system is called the linguistic encoding system. It is used to choose the right words and grammar to express their thoughts (conceptual preparation, lexical selection, morphological and phonological encoding). In this level, a speaker might select "*Khula bandh* (open and shut) T*atu hagaar* (superheated), "*Bai*" (we), and "*wae*" (water). In the process of lexical selection, multiple lemmas as well as grammatical features to express their thoughts could be triggered. Speech production is a series of steps in the mind, where each step helps achieve a targeted speech. The output of one step is used as input for the next step. However, the second level is called phonetic encoding, and it is used to

turn the selected lemmas into the sounds that listeners hear when someone speaks. Such slips may be committed when the speaker accidentally switches or substitutes the sounds of two or more words, such as *Shidalu hagaar* (cold heated), instead of *Khula bandh* (open and shut), *Thup bandh* (close and shut) instead of *Khula bandh* (open and shut), "*bai ga reh"* as an alternative of "*Bai*" (we) and "*gae"* (gone) as a substitute of "*wae*" (water). Resulting in a phrase or sentence that is unusual from what was intended. Errors can occur at this level such as at the phonological encoding stage of speech production, where the sounds or phonemes of words are being planned and combined. In the phonological encoding stage where the speaker's thoughts and ideas are decoded into the specific sounds and articulations in a language. This process starts with the selection of appropriate sounds and syllables to create the intended utterance. This may involve the arrangement of words correctly to utter different sentences. The phonological encoding stage is also important as it ensures the speaker's message is correctly conveyed or not.

Speakers initially need to formulate a thought before speaking during normal utterances. It starts from selecting the intended idea to express and making sure it matches the lexicon of the language community. This process is called conceptual preparation while the output is a lexical concept. In this situation, speakers may have a clear idea of the intended speech but struggle to trigger the targeted words to express it. This difficulty can arise when the idea does not align with the existing lexemes in the language and becomes challenging to express thoughts into speech. In such situations, speakers need to use a combination of different lexemes to express the targeted idea. The WEAVER++ model reveals the mystery behind speech production from conceptualizing an idea to generating the sounds needed to convey it. The model suggests that speakers sometimes produce words that do not even exist in the language. For example, in the collected data "*Pha, Shanus, shapet, ranawash, and Jo jo"* were used. These sounds are not part of their language's lexicon. According to the model, this can occur during the conceptual preparation stage, where the speaker is formulating their thoughts and ideas. If there is a hindrance at the conceptual stage, the speaker may struggle to express the concept clearly and fail to select the intended word. As a result, speakers may create a new lexical combination that further leads to conveying novel utterances.

After conceptual preparation the next stage is lexical selection. In this stage, the speaker chooses the appropriate words and phrases to express the concept or idea. If the words "*Pha, Shanus, shapet, ranawash, and Jo jo"* are created at this stage, they will be added to the mental lexicon. The next stage is phonological encoding where the speaker encodes the selected words and phrases into speech sounds which results in a slip of tongue in speech. Hussain, Zahid &Ilyas (2021) examined different kinds of slips of the tongue in Pakistan politicians' speeches and they found a similar result just like the above-mentioned slip one of the Pakistani politicians said: "dollars" instead of "rupees". They believed that slips of the tongue might occur in special situations caused by various conditions including anxiety symptoms, intellectual problems, and policy problems.

The WEAVER++ model is presented as a valuable theoretical framework for the study of speech production in the Shina language, as it outlines the cognitive processes involved in speech

production in the Shina language. Understanding how the model operates in Shina can shed light on how slips of the tongue, or language errors, arise at different stages of speech production. The current study develops an understanding of speech errors that occur in everyday speech production at different levels such as lexical, phonetic, or morphological. Additionally, it is recommended that future studies can also utilize the same model to classify slips of the tongue in other linguistic contexts.

5. Conclusion

The present study examined various slips of the tongue in the Shina language by utilizing Levelt's Speech Production Model as a framework. This approach assisted in the examination of cognitive mechanisms primary to speech production in the language. The finding of the present study reveals that Shina speakers commit errors in the same patterns as they are present in every language such as conceptualization, formulation, and articulation. This research enhances the concept of complex psycholinguistic features that influence speech production. Moreover, this study contributes to the psycholinguistic features of lesser-studied language and broadens the application of the speech production model. Furthermore, the implications of this research could be multifaceted as it establishes a foundational concept of speech errors in the Shina language. It offers valuable insights for language educators and speech therapists that can address communication challenges faced by speakers. This study could be helpful for linguists interested in both the universal and language-specific aspects of speech production. For future research, several avenues are suggested. Investigating speech errors with a larger sample size that includes bilingual speakers could improve the influence of error patterns. Additionally, controlled experimental studies may also be useful to examine external factors such as stress, anxiety, or pressure. Comparative studies between indigenous languages could further enrich cross-linguistic as well as psycholinguistic phenomena of speech production.

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