



The Tongue Thlipped: A Phonological Analysis of Tongue Slips in Iraqi Arabic Adult Colloquial Speech

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Abstract

One of the indicators revealing the breakdown of normal pronunciation and speech is making a tongue slip. The current research, drawn upon 201 speech errors collected through participant observation from daily spontaneous conversations of adult speakers of Iraqi Arabic colloquial speech, is concerned with presenting a descriptive phonological analysis of some of the tongue slips that occur in Iraqi Arabic speech, identifying their frequent types, and how consonants and vowels operate in these slips. The research adopted a qualitative quantitative method, based on the tongue slips classification by Carroll (2008), Shattuck-Hufnagel (2002), Garret (2002), and Fromkin (1973). The findings show that anticipation, perseveration, metathesis, substitution, omission and blends occur in Iraqi Arabic speech, with substitution being the most frequent, while no reported cases of shift and addition have been observed. The findings have provided a new insight in Iraqi Arabic phonology, revealing that a consonant sound can slip even if it is a cluster member. This fact has contributed to confirm the existence of initial two-consonant clusters, and has led to uncover a new aspect regarding new two-segment combinations for forming such clusters, but it has shown that whole initial or final clusters, or cluster segments, tend not to slip all together and simultaneously. The findings call for more investigation into the above unobserved types of tongue slips, and into other potential formations of initial clusters in the Iraqi Arabic phonological structure.

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انزلق اللسان": تحليل صوتي لزللات اللسان بين البالغين المتحدثين باللهجة العراقية العربية

رامي عيسى موسى *

المستخلص

أحد المؤشرات التي تكشف تعطب النطق والكلام الطبيعي هو ارتكاب زلات اللسان. يهدف البحث الحالي، الذي استند إلى 201 خطأ في الكلام تم جمعها من خلال ملاحظة المحادثات اليومية للبالغين المتكلمين بالعربية العراقية، إلى تقديم تحليل وصفي صوتي لبعض زلات اللسان التي تحدث في الكلام العربي العراقي، وتحديد أنواعها المتكررة، وكيفية عمل الحروف الساكنة والمتحركة في هذه الزلات. اعتمد

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البحث على منهج كمي نوعي، بناءً على تصنيف زلات اللسان لكارول (2008)، وشاتوك-هوفناجل (2002)، وغاريت (2002)، وفرومكين (1973). أظهرت النتائج أن التوقع والتحفظ والإبدال والاستبدال والحذف والمزج حدثت في الكلام العربي العراقي، وكان الاستبدال هو الأكثر شيوعاً، بينما لم تلاحظ أي حالات من التحول والإضافة. قدمت النتائج رؤية جديدة في النظام الصوتي في اللهجة العربية العراقية، كاشفة أن الصوت الساكن يمكن أن ينزلق حتى لو كان أحد عناصر مجموعة أصوات ساكنة. وقد ساهم هذا في تأكيد وجود مجموعات صوتية أولية ثنائية الحروف الساكنة، وأدى إلى كشف جانب جديد يتعلق بتركيبات جديدة من مقاطعين لتشكيل هذه المجموعات، إلا أنها أظهرت أن المجموعات الأولية أو النهائية، أو مقاطع المجموعات، لا تميل إلى الانزلاق معاً وفي آن واحد. تدعو النتائج إلى مزيد من البحث في أنواع زلات اللسان غير الملحوظة المذكورة أعلاه، وفي التكوينات المحتملة الأخرى للمجموعات الأولية في البنية الصوتية للهجة العربية العراقية.

الكلمات المفتاحية: الكلام العامي، النظام الصوتي في اللهجة العربية العراقية، زلات اللسان، أخطاء الكلام، أنواع زلات اللسان

1. Introduction

In oral communication, it sometimes happens that a speaker's tongue fails articulatorily and systematically to produce intended pronunciations of utterances, leading to make what is called tongue slip. All human beings make tongue slips, where they sometimes come out as being amusing. Also known as speech errors, in which speakers depart from the intended utterance in some way, they are linguistically interesting and of significant value due to the fact that they give interesting details about language use (Fromkin et al., 2011: 255-256). Most speakers in communication have had the experience of hearing themselves slip utterances different from what they intended to say. Many of these speech errors which occur naturally and spontaneously are articulatory in nature, as when sounds exchange their places (Garman, 1990: 151). In any natural situation, speakers often get surprised or embarrassed when they produce tongue slips, and one of the interesting facts about them is that they are not made consciously on purpose; they are unusually and unintendedly articulated (Baars et al., 1975: 389; Hussain et al., 2021: 24). Since they are unintendedly produced, they occur beyond the speakers' control, and if necessary, they can be later corrected by them. Moreover, they are not representative or indicative of the speakers' ordinary everyday language use (Baars, 1992a: vii-viii).

1.1 Research Problem

Carrying out this research is an attempt to open a door for investigating more about tongue slips in Iraqi Arabic adults' colloquial speech. So, since the underlying purpose is to describe a specific phonological phenomenon, the problem, then, is often associated with investigating and revealing the patterns of errors which demonstrate the regularity of speech errors.

1.2 Aims of the Study

This study, limiting to investigate tongue slips that occur in the casual speech of Iraqi Arabic adult speakers, aims to present a phonological analysis and explanation for some of the tongue slips so as to find out the types that are frequent in Iraqi Arabic speakers' speech and to explore the mechanism of slipped consonants and vowels in syllable structures.

1.3 Research Questions

In light of the aims above, the current study seeks to answer the following research questions:

1. What types of tongue slips are uttered in the adult colloquial speech of Iraqi Arabic?

2. What are the most frequently-uttered types of tongue slips?
3. Do consonants slip with consonants and vowels with vowels, and which slip more?
4. What type of syllable structure position is subject to slip more frequently?

1.4 Hypotheses

The study hypothesises that speech errors elicited are not randomly made, but are the result of the activation of consonants and vowels. So, they are regular in one's speech. It is also hypothesised that slips are predictable in the sense that one can identify or detect what sort of error has occurred.

2. Literature Review

2.1 Definitions

Tongue slips can be viewed as “involuntary deviations in performance from the speaker's current phonological, grammatical, or lexical intention” (Boomer & Laver, 1973: 123). Two more definitions for tongue slips particularly related to conception and function are provided to further explain their nature. Conceptually, tongue slips “are actions that mismatch their own guiding intentions.” That is, they are errors which violate their own intentions; an utterance mismatches or is at odds with its target. Functionally, they may be looked at as being actions that speakers and listeners quickly recognize as unintended speech errors when they become aware of them. They are different or distinct from other mistakes (Baars, 1992a: vii-viii, 5). Still also called “Freudian slips” by many people, tongue slips or speech errors could be defined as words that are replaced by other intruding words, that is, words never wanted or never meant to be used or uttered (Sedivy 2020: 725-738). For Thieffry et al. (2023: 2), speech errors from a psycholinguistic perspective are defined as being failures of error control systems, and they occur “when brain and tongue deny to work in accordance” (Oreč, 2017: 7).

2.2 A Linguistic Standpoint on Tongue Slips

The study of speech errors has become a good source for understanding the speech planning and production process, revealing a lot about the underlying mechanics of speaking. Thus, speech errors are seen as an interesting window to look into the mind (Sedivy, *ibid*: 726; Aitchison, 2011: 215, 216; Carrol, 2008: 197). They show how particular units underlie linguistic performance, revealing the reality and providing evidence for general phonological rules and units (Fromkin, 1973: 215).

Linguistically, slips of the tongue can be observed in any kind of linguistic unit. However, they are in most cases encountered between phonemes, morphemes and words, and can be found on the phonological and syntactic levels (Dell, 1995: 190). Furthermore, tongue slips can reveal themselves in a number of ways or show error processes such as segment or word substitutions, segment deletion, segment addition, or segment transposition. These segmental errors can take place within single words and across word boundaries, and involve either consonants or vowels (Fromkin, *ibid*: 217-220). On the one hand, when two sounds, whether consonants or vowels, are substituted or metathesized or undergo any other speech error process, they have similarity in terms of phonetic features, i.e. they are phonetically similar, and may be different in only one distinctive feature (Nooteboom, 1969: 121; Fromkin, *ibid*: 226). Sometimes whole

clusters can be moved or transposed in an utterance. Consider *throat cutting* which is pronounced as *coat thrutting*, where the cluster (thr) /θr/ is shifted to the second word (Fromkin, *ibid*: 221).

On the other hand, when words are slipped, the word slipped often carries some sound and meaning similarity to the target word (Aitchison, *ibid*: 226). Besides, when such words are switched or substituted, for instance, they (the slipped and the target words) belong to each other in terms of word class – that is, the slipped word typically has the same word class as the intended word. Thus, nouns switch or substitute with nouns, verbs with verbs, adjectives with adjectives, etc. (Nooteboom, *ibid*: 130; Fromkin, *ibid*: 233). Additionally, any type of tongue slip may not occur alone. Not only single speech errors are found in an utterance but also multiple ones, in which many types of tongue slips or combinations of them occur. For instance, the utterance *I wanna be green. You be blue* /aɪ wənə bi gri:n ju bi blu:/ is mistakenly pronounced as /aɪ wənə bi gri:n ju blu: bi:z/ (*I wanna be green. You blue bees*). The content words ‘be’ and ‘blue’ switch their position, i.e. are metathesised, and the verb ‘be’ has had the third-person singular present tense suffix -es, non-contextually added to it. So, metathesis and addition occur in this utterance (Jaeger, 2005: 34).

2.3 Causes of Tongue Slips

The cause of speech errors is not ignorance or forgetfulness of the target but a control problem in the process of speech production (Baars, 1992a: vii, viii, 6). Thus, a mistake made out of ignorance is not considered a tongue slip. With this viewpoint in mind, a speaker’s cognitive and psychological state may affect his speech and give rise to errors. In this respect, the main reason of the production of speech errors may be attributed to stress and anxiety. For instance, a speaker in a job interview may utter *pleased to beat you* instead of the target *pleased to meet you* (Akbarov, 2012: 55, 57). According to Aitchison (2011: 215) and Sariasih et al. (2023: 289), since every speaker is likely to produce tongue slips from time to time, they often do so when they are either tired, drunk, nervous, excessively enthusiastic or unprepared. So, tongue slips as a type of errors are common to be quite normal, since they occur due to the speaker’s unstable cognitive or psychological state. Despite being normal, that does not mean they tend to occur on a quite frequent basis (Garman, 1990: 151).

2.4 Classification of Tongue Slips

Several researchers have looked differently at tongue slips, and therefore different classifications have been proposed. Among these are the following eight major types suggested by Carroll (2008: 195), Shattuck-Hufnagel (2002: 77), Garret (2002: 38), and Fromkin (1973: 218-229): anticipation, perseveration, metathesis, shift, substitution, omission, addition, and blends.

a. Anticipation: It is the result of “a substitution of one sound in anticipation of a sound which occurs later in the utterance, with no other substitutions occurring,” as shown in the substitution of /s/ by the following /sh/ in *also share*, resulting in *alsho share*. An anticipation error takes place when a later sound segment takes the place of or replaces an earlier one.

b. Perseveration: It occurs when a sound that is already planned for and spoken earlier in the utterance is perseverated and has an effect on a sound planned for later in the utterance. A case in point is the utterance *John gave the goy* instead of the target *John gave the boy*. That is, an earlier sound replaces a later sound, so perseveration is seen as repetition or postposition where sounds already uttered are repeated later to replace other sounds.

c. Metathesis: Metathesis as a phonological phenomenon is a switch that occurs in the linear ordering of the segments intended. It is a linguistic term that refers to the transposition of two sound segments inside a word, phrase or sentence, indicating a sound shift that modifies the order of two phonemes in one utterance. In other words, metathesis results when a sound departs or hops out its proper location and appears in a different position in the word. For example, the speaker produces *in the fast pew weeks* instead of *in the past few weeks* or *fash and tickle* instead of *fish and tackle*.

d. Shift: A shift, also known as movement, is a process in which a target sound disappears or is removed from its appropriate or originally planned position and appears or is added at another position in the target sequence, as in *State-lowned land* for *state-owned land*, or as in *most claudal side* for *most caudal slide*.

e. Substitution: This error happens when one intruding segment, which may or may not be existing in the utterance, replaces another segment. Fromkin (ibid: 221-225) classifies substitution into sound and word substitutions. As an illustration for sound or phoneme substitution, examine the substitution of the phoneme /f/ for /v/ in the word *reveal*, resulting in *refeel*, where only the feature value (voice) is changed. As for word or lexical substitution, consider the word *piss* being substituted for *stress*. It can be added that the new wrong word is related to the intended word either semantically or phonologically. Further supportive examples come from Poulisse (1999: 109). Consider the utterance /kələz/ for the word *colours* instead of the target /kʌləz/, whereas the lexical substitution is exemplified by the substitution of the word *glass* for *bottle* in *uh a thing you put on a glass of milk, on uh, a bottle of milk*.

f. Omission: Omission or deletion is found when a sound segment is left out or when an intended segment is missing. It indicates the dropping of a target segment from the target sequence, and elsewhere in the utterance there may or may not exist a similar sequence. For instance, the sound /r/ in *two hundred drugs* is deleted, contributing to the utterance *two hundred dugs*.

g. Addition: This speech error comes about when an extra segment is added or inserted into the target sequence but in an incorrect location. The added segment is or is not likely to have a source in the utterance. This error can be illustrated by the following example. The utterance *I didn't explain this clarefully enough* is slipped due to the addition of the segment /l/ to the target word *carefully*.

h. Blends: They are two words, which were planned or being taken into account to occur in sequence, are blended into one. They are the result of the combination of existent words with similar semantic and phonological features into one existing or non-existing word. By way of illustration, consider the example from Fromkin that tackles the mixture of *switch and changed* into *swinged*.

2.5 A Brief Phonology of Iraqi Arabic

The syllable structure of Iraqi Arabic allows one consonant as an onset followed by a short vowel (CV), or a single consonant onset followed by a long vowel (CVV), where the double (VV) symbols indicate a long vowel. Other types of syllable structure include (CVC), (CVCC), (CVVC), (CVVCC), (CCV), (CCVV), (CCVC), (CCVVC), and (CCVCC) (Mustafawi, 2018: 19-20). Some syllable structures in a word may contain geminated consonants which involve prolongation of the continuant sounds and a longer closure of plosive sounds. They are seen as identical clusters, as in /mattan/ (CVC-CVC) 'cause to be strong'. In these clusters, the first segment of the cluster acts as a coda of the preceding syllable, whereas the second segment as an onset of the following syllable (Al-Ani, 1970: 77). Moreover, what is possibly

characteristic of Iraqi Arabic phonotactics is that some consonants can form clusters; they are allowed to follow each other in utterances. Iraqi Arabic speech allows a two-consonant cluster at the beginning of words. Such a cluster (CC+V) may include /td/, /mr/, /dr/, and /tl/ (Al-Bazi, 2006: 20, 38). A two-consonant cluster may also be formed at the final position of words, as in /dars/ 'lesson' (Hassan, 2011: 48).

With regard to vowels, there are no words in Iraqi Arabic, and in Arabic too, that begin with vowels. Vowels come second in a syllable which may begin with a glottal stop consonant /ʔ/. This articulation with an initial glottal sound appears to be plausible as all Arabic words are initiated with a consonant (Al-Ani, *ibid*: 22).

3. Related Studies

A number of studies have been carried out to explore tongue slips in Arabic in general and in Iraqi Arabic in particular, along with some reference to English. For instance, Khassawneh et al.'s (2018) comparative study analysed one type of tongue slips, metathesis, in Standard and colloquial Arabic, English, and several other languages, with the objective to seek the main cause of metathesis if it is the outcome of tongue slips, absence of mind in speech production, or phonological sound change. Besides, it aimed at showing and describing its distributions in Standard and Colloquial Arabic. The findings showed that metathesis is the phonological result of a change in sound in all languages and that it can affect the structure of sound units. Added to that, metathesis is a phonologically-governed phenomenon.

One of the studies addressing tongue slips from a psychological perspective is Nayef and El-Nashar's (2014). With a corpus of 1102 speech errors collected from Colloquial Arabic used in Cairo, they investigated the psychological reality of speech errors and linguistic units on a three-level analysis: phonological, lexical and syntactic. The study classified speech errors into four types: exchange, blend, substitution, and deletion with two subcategories: anticipation and perseveration. It was concluded that consonants and vowels, with their phonetic features and the syllables in which they were composed, are psychologically real units of performance. However, it was found that consonant clusters are not unitary units of performance. Moreover, the study showed that speech errors can be accounted for their existence on lexical and syntactic levels through the existence of syntactic features, morpheme and word as real units of performance, and that they can provide insights into the internal mechanism of speech production processes.

A study by Rashid (2006) examined phonologically some tongue slips in spoken Iraqi Arabic speech. Dividing speech errors into seven types, i.e., anticipation, perseveration, metathesis, blends, haplogies, misderivations, and word substitutions, the study analysed descriptively a sample of only 23 speech errors. The results were that consonants slip more than vowels and that tongue slips, taking place in similar syllable constituents, can be more than one kind occurring in the same sentence.

Abd-El-Jawad and Abu-Salim (1987) explored 911 speech errors in Standard Arabic used by adult Jordanian native speakers in their daily conversations and in television and radio talk shows. They examined the linguistic and semantic properties of tongue slips and the nature of the slipped sound units and even morphemes by classifying them into three categories: segment and word substitution, transposition and blending. Among the findings was that no case of addition and deletion of segments in Arabic corpus was reported, and that consonant sounds exchange their position across words and syllable boundary. Moreover,

the phonetic strings coming out as the result of speech errors do not go against the phonotactic constraints of Arabic.

4. Methodology

4.1 Participants and Data Collection

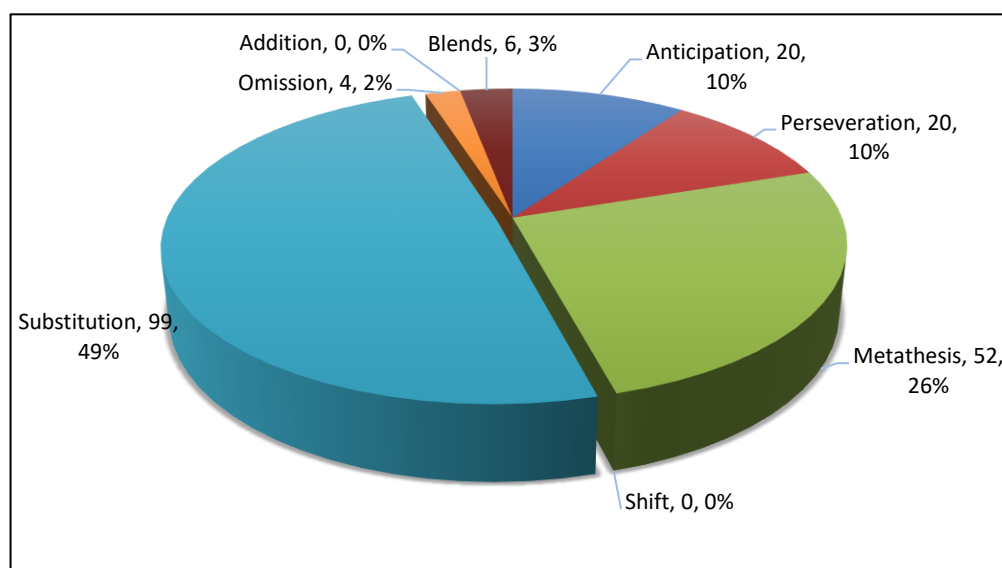
The data for this study are a collection of 201 speech errors elicited mainly from daily spontaneous conversations of adult speakers of Iraqi Arabic colloquial speech, and were gathered over approximately an eight-month period. They were uttered by a variety of Iraqi people representing different social classes and status, i.e., low, working, middle and upper, and belonging to both genders: teachers, different professional occupation holders, workers, university students, friends, relatives, and other common people; even the current researcher's few speech errors were taken into account and contributed to the total data. These participants, aged 18 and beyond, belong to different ethnic groups: Arabs, Kurds, Turkmens, Assyrians (Christians), Yezidis, and Shabaks. Despite each group speaking their own distinct language among their members when meeting together, these groups are all united with regard to the daily spoken language when coming to interact together; they all share, or know and speak fluently the Mesopotamian Arabic, which is the dialect of Iraqi Arabic community. The Iraqi Arabic dialect is mutually intelligible among all these ethnic groups. In addition, the participants were not pathological speakers; they did not suffer from brain disorders or laryngeal problems in producing speech.

For data collection purposes, the main technique used was participant observation, in which the participants involved were given intensive language observation by the researcher in their natural setting. The actual utterances involving speech errors were observed and immediately documented as accurately as possible, as they were actually heard, by writing them down in Arabic orthography (See Appendix for all participants' utterances involving slips of the tongue with their targets, meanings and syllable structures). The intended target utterances were specified and spotted either by the speaker him/herself repeating his/her own utterance to give the correct target utterance, sometimes reporting that he/she has made a speech error, or by the researcher as a listener questioning the speaker about the tongue slip committed or asking to repeat what was actually said or meant to be said, in case of no speaker's repetition or report was provided. In other cases, context played a major linguistic role in capturing the target utterances. In a later stage, the utterances were manually transcribed, making practical and effective use of phonemic transcription symbols for Iraqi Arabic consonants and vowels, taken from Al-Bazi (2006: 1) and Alkalesi (2006: 4-5).

It has to be noted that speech errors produced when speakers were reading from a text were not taken into account as sources in the data as speakers sometimes get confused by the orthographic letters of the words and sentences read.

4.2 Data Analysis Procedure

The researcher adopted a qualitative quantitative method for analysing the data. The collected data were systematically analysed by following several steps. First, the transcribed speech errors were classified according to the eight basic sorts of tongue slips suggested by Carroll (2008), Shattuck-Hufnagel (2002), Garret (2002), and Fromkin (1973), with noting that the researcher merged the various types of tongue slips suggested by the above scholars into eight, and thus having an eclectic approach. Second, the particular speech errors identified as general examples of a certain type of tongue slips were further classified into



subcategories such as syllable structure types and syllable positions. Others were given categories like consonants and vowels, and parts of speech. Third, the researcher provided a detailed phonological analysis and description for the occurrence of these tongue slips. In a subsequent stage, numbers and percentages of observation for the occurrence of tongue slips were provided in figures, along with findings. Finally, general conclusions were made.

5. Findings and Discussion

The findings showed that the participants did not make errors of all types of tongue slips. They showed errors of anticipation, perseveration, metathesis, substitution, omission and blends, occurring both within words and across word boundaries, but errors of shift and addition were not made. Figure 1 shows the frequency and percentage of each type of tongue slips.

Figure 1. Number of occurrences and percentages of types of tongue slips in Iraqi Arabic adult colloquial speech

Out of 201 speech errors collected, the most frequent type of tongue slips produced was substitution (both sound and word) with a number of observations reaching 99, i.e. 49 %, and metathesis, with 52 (26%), came second in frequency. Anticipation and perseveration have exactly the same frequency of occurrence, i.e., 20 (10%), followed by the least frequent types which are blends and omission, the latter being the least frequent with only 4 occurrences. No occurrences of shift and addition were found. The reason why substitution is the most frequently produced type of tongue slips could be that this process of slipping seems easier to make than all other types. For substitution to occur, it requires a little effort to replace a sound segment (in one syllable position) or a whole word. A sound segment need not travel from one syllable position to another; it is only replaced with a newly introduced one. And the same could be true with word substitution. On the contrary, there seemingly tends to have more effort and more accuracy needed for exchanging, anticipating or perseverating sound segments in the same or different syllable positions. Metathesised, anticipated or perseverated sound segments need to jump from one syllable position to another. These three processes seem to be more cognitively complicated than substitution when producing speech errors. Blends, very infrequent, appear to be even more phonologically complex as they require combinations of parts of different words, not just sound transpositions, and putting these parts in the correct

syllable structure. Therefore, they tend to demand more phonological effort. Omission, the least frequent type, and almost equal to blends in terms of frequency of occurrence, is a very inactive process in producing tongue slips in Iraqi Arabic adult colloquial speech. Sound segments are not often removed from their intended syllable positions so that no distortions or changes in syllables and words appear. Finally, Iraqi Arabic adult speakers seem to have a tendency not to add new sound segments in incorrect syllable positions, or shift or move them to inappropriate positions. This newly uncovered fact explains that syllable structures in Iraqi Arabic phonology are inclined to maintain segments in syllable slots, particularly consonants (both onsets and codas), and to keep the number of segments in syllables intact, so that no distortions and changes occur in these syllable structures.

As for the competing situation between consonants and vowels in terms of frequency of occurrence, it was revealed that consonants were far more frequently slipped than vowels. Out of 201 speech errors, 161 involved single slipped consonants and vowels. The other 40 were word substitution (34) and blends (6), and these were excluded from the calculation of the frequency between consonants and vowels since they involve consonants and vowels together and even whole syllables in their production of tongue slips, so it was unknown exactly whether consonants or vowels were slipped. Out of 161, only 4 (2.48%) utterances involved vowel sounds, the rest involved 157 (97.51%) consonant sounds. These cases of slipped vowels were reported as follows: one in perseveration, one in metathesis and two in sound substitution. As was observed through the data analysis, vowels were less liable to slip than consonants and consonants were more liable to change in rapid speech whether within a syllable or at syllable boundary. This could be so because vowels make the primary formation of syllables, and no syllable exists without a vowel (syllabic consonants are a special case). Hence, vowels seem to be more stable and do not easily undergo change or slippage, so they are kept without slippage to make words more recognisable.

Additionally, it was found that consonants were always slipped for other consonants, and vowels for vowels. No single occurrence of a consonant slip for a vowel or vice versa was attested in the data of the present study. This finding can support the belief that different segmental slots are spared for consonants and vowels.

We now proceed to the discussion of the phonological occurrence of some tongue slips in Iraqi Arabic speech. In the discussion of each type, examples given are classified on the basis of the sort of the syllable structure involved. Additional categories for vowels and syllables are given for the purpose of enriching the discussion.

5.1 Anticipation

The anticipated errors occur with consonants only and in different syllable positions. As Figure 2 indicates, onset with onset position type dominates the rate of occurrence of anticipated errors.

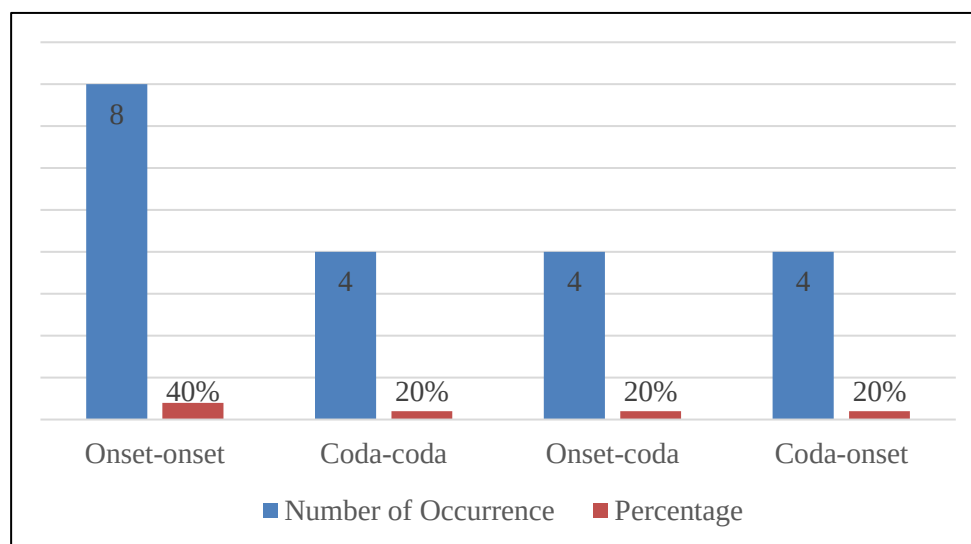


Figure 2. Different syllable structure positions of anticipated errors with number of occurrences and percentages

- a. Onset with onset (CV.CV): the target utterance /ba:.jo:.mi:.ka:.ni:k/ 'biomechanics' has been mistakenly pronounced as /ma:.jo:.mi:.ka:.ni:k/. The onset sound /m/ of the third syllable /mi:/ is anticipated to the onset position of the first syllable /ba:/, replacing the onset sound /b/. This occurrence of anticipation is due to the fact that these two sounds /m/ and /b/ have some phonetic features in common: [+voiced], [+labial], [-strident], [-lateral], and [-approximant]. Another example that needs to be discussed due to its significant value and its new contribution to Iraqi Arabic phonology is /ma: ʃift ʃsaw.wa/ 'Did not you see what he did?', which is changed into /ma: sift ʃsaw.wa/. It involves anticipating the second sound segment /s/ (the source of slipping) of the initial two-consonant cluster /ʃs/ into an onset position of the target /ʃift/, replacing /ʃ/. This example provides the new fact that tongue slips in Iraqi Arabic colloquial speech can involve sound segments of consonant clusters.
- b. Coda with coda (CVC.CVC): the intended noun /bar.mi:l/ 'barrel' is pronounced as /bal.mi:l/. The speaker gets the /l/ which occurs in coda position of the second syllable /mi:l/ in anticipation of the coda /r/ of the first syllable /bar/. That is, the final /l/ of the second syllable is anticipated in the final /r/ of the first syllable, producing /bal.mi:l/. These two sounds share similar features: [+voiced], [+sonorant], [+consonantal], [+approximant], [+continuant], and [-strident].
- c. Onset with coda (CVC): in /mnaq.qaʔ/ 'spotted' → /mnaʔ.taʔ/, this example reflects a speech error involving a geminate syllable onset with a coda anticipation. The final alveo-dental emphatic stop consonant /ʔ/ which occurs later in the second syllable is used again instead of the initial stop uvular consonant /q/ in the same syllable. When the sound /ʔ/ takes the position of a geminate consonant /q/, it accepts its gemination. So happened, the geminate consonant is lost and the simple consonant /ʔ/ acquires gemination. The anticipation is due to the similarities these two sounds have: [+voiceless], [+obstruent], [+anterior], [-sonorant], [-strident], and [-nasal]. Note that it is possible to say the sound /ʔ/ has been anticipated not only with an onset but also with a coda. However, this

example has been taken as an onset-with-coda anticipation due to the belief that in Iraqi Arabic phonology, onsets are more basic than codas in the sense that onsets always open a syllable and that other syllable structures may end with no coda. Note again that this example has demonstrated that initial two-consonant clusters in Iraqi Arabic phonology may not only be formed by /td/, /mr/, /dr/, and /tl/, as Al-Bazi (2006) argued, but also by /mn/.

- d. Coda with onset (CVC.CV): /ʃahn mu:.ba:.jil/ ‘phone charging’ is slipped into /ʃahm mu:.ba:.jil/. The final nasal /n/ of the two-consonant cluster in first target word /ʃahn/ is changed and replaced by the initial nasal /m/ of the first syllable of the second target word /mu:.ba:.jil/, thus getting /ʃahm mu:.ba:.jil/. The onset /m/ is anticipated in the second coda position of the consonant cluster /hn/. This example indicates the fact that final-two consonant clusters are also involved in slipping, similar to initial-two consonant clusters. This error involving syllable coda with onset anticipation occurred since the two sounds are both [+voiced], [+nasal], [+sonorant], and [+continuant], and their place of articulation is near to each other, i.e., /m/ is [+labial] while /n/ is [+coronal].

5.2 Perseveration

With a number of occurrences reaching 19 and involving only consonants, perseverated errors occur in different syllable positions, and only one utterance in the data shows a vowel being perseverated. Figure 3 reveals that perseveration of the onset-with-onset type is the most occurring, and that coda-with-coda perseveration, also frequent, comes second in the frequency of occurrences.

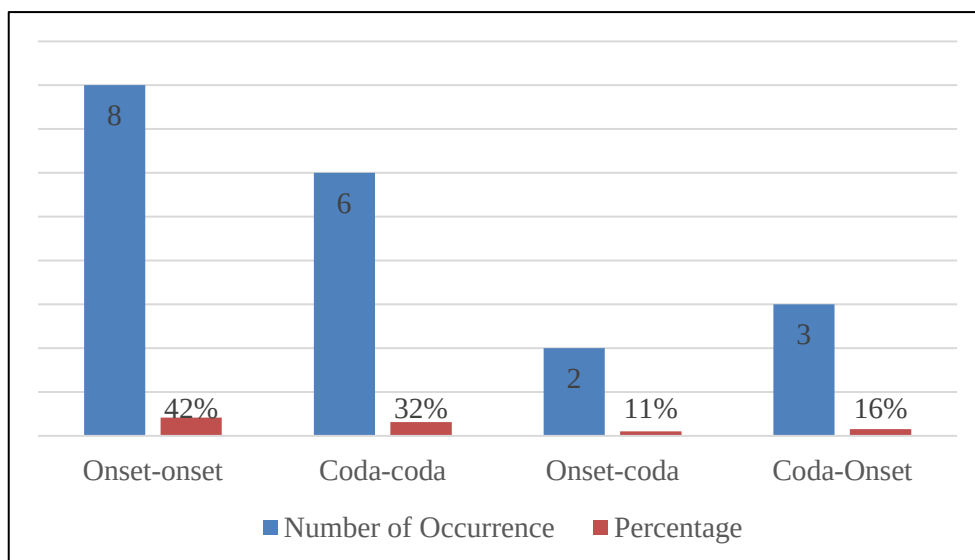


Figure 3. Different syllable structure positions of consonant perseverated errors with number of occurrences and percentages

- a. Onset with onset (CV.CV): the initial bilabial consonant /b/ in the second target word /be:.dʒi/ of the phrase /baw.wa:.ba:t be:.dʒi:/ ‘Gates of Beji’ (city) is perseverated by uttering it once again instead of the initial alveopalatal consonant /dʒ/ in the second syllable of the same

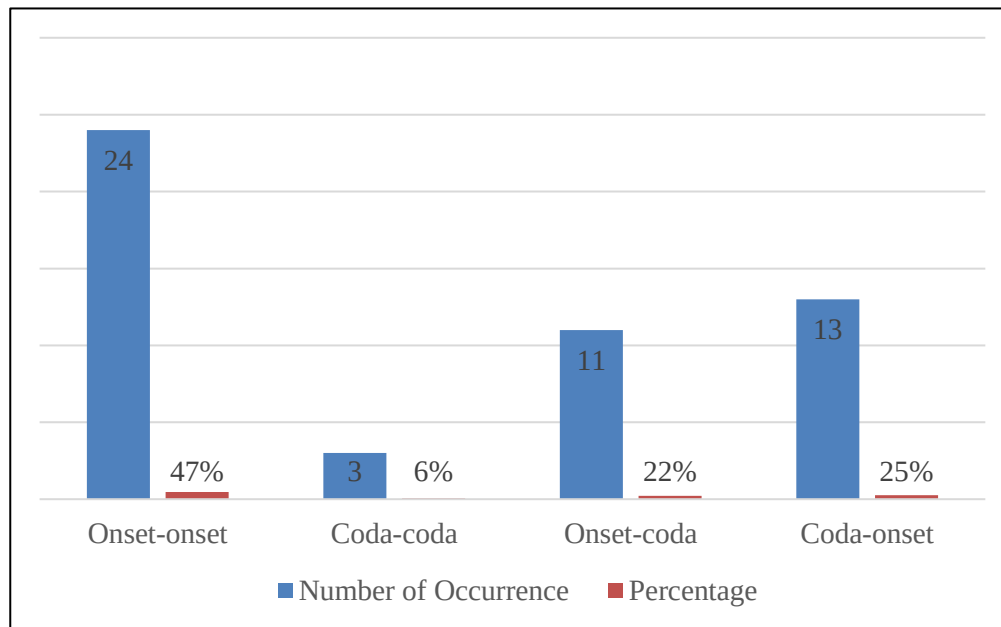
target word, producing /baw.wa:ba:t be:bi:/. This perseveration speech error involving consonants in syllable-onset position occurred because the two sounds /b/ and /dʒ/ are both [+voiced], [+obstruent], [-nasal], and [-continuant], even though their place of articulation is different; /b/ is [+labial] while /dʒ/ is [+coronal].

- b. Coda with coda (CVC.CVC): in syllable-coda position, there is also a perseveration speech error where consonants are engaged. This is exemplified in the intended phrase /dʒe:f ʕas.ka.ri/ ‘military army’ which is mistakenly pronounced as /dʒe:f ʕaf.ka.ri/. The speaker retained the final sound /f/ in the first target word and pronounced it instead of the sound /s/ located in coda position in the first syllable of the second word /ʕas.ka.ri/. This happened due to the preservation of the sound /f/ within the speaker's brain and its addition into another coda position, replacing that coda sound /s/. This perseveration is due to the fact that these sounds are similar in being [+voiceless], [+strident], [+obstruent], [+sibilant], [-sonorant] and [+coronal], their point of articulation being very near each other.
- c. Onset with coda (CVC): in /lim.man ji.dʒi: ʔit.taħ.di:θ/ ‘when the update comes’, the onset consonant /dʒ/, which occurs earlier in the second syllable of the second target word /ji.dʒi:/, is repeated to take the place of the later coming coda consonant /θ/ in the third target word /ʔit.taħ.di:θ/. The result is a meaningless onset-coda consonant perseveration /lim.man ji.dʒi: ʔit.taħ.di:dʒi/. This perseveration process happened because the second word /ji.dʒi:/ and the final syllable /di:θ/ are phonologically similar as having similar syllable structures and similar nuclei. The sound /dʒ/ in /ji.dʒi:/ is preceded by a palatal consonant /j/ and a short close front vowel /i/, and the sound /θ/ is preceded by a long close front vowel /i:/. This seems to have caused the consonant /dʒ/ to be perseverated in the final word.
- d. Coda with onset (CVC.CV): the first word in /la:zm ʔis.ti.ða:fa/ ‘it should be hosting’ contains the first coda consonant /z/ of the cluster /zm/. The /z/ is perseverated later in onset position in the penultimate syllable /ða:/ of the second intended word, rendering the syllable into /za:/ and finally resulting in /la:zm ʔis.ti.za:fa/. The reason behind this perseveration process is that the two consonants are phonetically similar: [+voiced], [+fricative], [+obstruent], [-sonorant] and [+coronal]. The fact that their place of articulation is near each other, i.e. [+coronal], has triggered the replacement of /z/ by /d/. Another example that illustrates a perseveration of a coda with an onset but in a different fashion is /ʔa.xað.ti: ʔin.nis.xa ma:l qiş.şə/ ‘Did you get the copy of the story?’ → /ʔa.xað.ti: ʔin.nis.xa ma:l qiş.la/. Here, the coda lateral consonant /l/ in the third word /ma:l/ is perseverated to replace the second segment of the geminate sound /şş/, which occurs as an onset for the final syllable.
- e. Vowel perseveration: one of the utterances that has perseverated a vowel is /ka.lis.jo:m/ ‘calcium’ → /ka.las.jo:m/. In this example, the vowel /a/ in the first syllable /ka/ is retained and substituted for the vowel /i/ in the second syllable /las/. The substitution of /i/ by /a/ has occurred because /i/ is preceded by a sound to which /i/ is similar, even if that sound comes from a different syllable. This exhibits that sounds interact with one another on the basis of some phonetic similarity. Therefore, as noticed in this example, vowels interact with other vowels, not with consonants.
- f. Syllable perseveration: in /ʔaj.ja:m za.ma:n/ ‘the past days’ → /ʔaj.ja:m zi.ja:m/, a whole syllable can be perseverated. The speaker repeats the final whole syllable /ja:m/ of the first target word

/ʔaj.ja:m/ and places it instead of the final syllable /ma:n/ of the second target word /zama:n/ with the change of /a/ into /i/. The perseveration occurs because the final syllable /ja:m/ and the final one /ma:n/ are phonologically similar as having an identical structure and the same nucleus. Also, the vowel /a/ in the first syllable of the second word changes or is substituted into /i/ since both are front. This substitution could be regarded as another type of tongue slips in the same utterance.

5.3 Metathesis

It was noticed that both consonants and vowels are metathesised, 51 cases for consonants and 1 for vowels. The consonant metathesis occurs in initial (onset) and final (coda) positions. As shown in Figure 4, the commonest metathesised syllable structure position is onset-onset.



Figure

4. Different syllable structure positions of consonant metathesised errors with number of occurrences and percentages

- a. Onset with onset (CV.CV): in /par.la.ma:n/ ‘parliament’, the speaker exchanges the initial lateral /l/ in the second syllable of the intended word with the initial nasal /m/ in the third syllable. This metathesis process occurring in syllable onset position with the following onset produces the meaningless utterance /par.ma.la:n/, keeping all other syllables and sounds intact and in their own positions. These two consonants have the following features in common: [+voiced], [+sonorant], [+continuant] and [+anterior]. The difference between them is that /l/ is [+alveolar] and [+coronal] while /m/ is [+labial] and [+nasal]. An extra example showing an onset-with-onset metathesis is /tan.nu:ra/ ‘skirt’ changing into /tar.ru:na/. Here, the single onset consonant /r/ exchanges position with a geminate onset consonant /n/. The geminate consonant /n/ loses its gemination and the single consonant /r/ acquires gemination. The consonants are affected, but the gemination is intact. So, the geminate consonant /n/ becomes nongeminate and the nongeminate /r/ consonant becomes

geminate. This is because of the new location or context that the consonant /r/ is placed in after the metathesis process is carried out. Better put, both of the consonants adjust phonetically to fit in the new context or position either by missing or acquiring gemination.

- b. Onset with coda (CVC.CVC): a phonological analysis of the word /mab.laɣ/ ‘a sum of money’ shows that a metathesised slip occurs in the position of a coda with the following coda. The speaker switches the order of the final stop consonant /b/ in the first syllable of the target word with the order of the final voiced fricative consonant /ɣ/ in the second syllable. Consequently, an utterance like /maɣ.lab/ is unintentionally produced. This could be caused by the fact that these consonants are [+voiced] and [+obstruent].
- c. Onset with coda (CVC): the intended word /sim.sim/ ‘sesame’ which is metathesised as /mis.mis/ is seen to have exchanged an onset with a coda in both syllables. The speaker exchanges the initial consonant /s/ in the first syllable with the final consonant /m/ in the same syllable. The same exchange is repeated in the second syllable when the same consonants replace each other’s position. These two sounds are metathesised since they their places of articulation are close to each other; /s/ is [+alveolar] and /m/ is [+bilabial].
- d. Coda with onset (CVC.CV): in an example like the utterance /sa:d.na/ whose intended utterance is /sa:n.da/ ‘supportive’, the coda alveolar nasal sound /n/ and the following onset alveolar plosive sound /d/ are metathesised. Since /n/ occurs in coda position and /d/ in onset position of the following syllable (i.e. successive consonants at the syllable boundary), they are likely to exchange their positions. Additionally, the consonants exchanged their positions since they are phonetically similar in being [+voiced], [+obstruent], and [+anterior]. They are articulated at the same place, i.e. alveolar ridge.
- e. Vowel metathesis: the target word /ha:si.ba:t/ ‘computers’ metathesised as the utterance /hi.sa:ba:t/ ‘calculations’ illustrates the occurrence of vowel metathesis. The speaker transposes the positions of the vowels /a:/ and /i/ of the first and second syllable. These vowels are both [+front]. The vowel /a:/ is [+open] whereas /i/ is [+close]. Note that this example can also be considered a word substitution error as the word which means ‘computers’ is substituted by the meaningful word ‘calculations.’

5.4 Substitution

Having the highest proportion (99), with (49 %) in total percent, sound (both consonants and vowels) substitution was observed in 65 (65.65 %) cases, distributed by 63 cases for consonants and only 2 for vowels, and word substitution in 34 (34.34 %) cases.

Out of 65 sound substitution reported cases, 45 (84.90 %) were observed for onset position and 18 (33.96 %) for coda position. Sound substitution in syllable-onset position dominates the percentage. As noticed in anticipation, perseveration and metathesis, where sound segments in onset position get slipped with other sound segments in onset position, the same is true with sound substitution. So, it can be said that onsets are more subject to change or slip in Iraqi Arabic adult colloquial speech as they have outnumbered codas in all types of tongue slips.

Word substitution has also its own frequency of occurrences and percentage. Out of 34 word substitution errors, 25 (73.52 %) cases involved noun-to-noun substitution, 4 (11.76 %) adjective-to-adjective, 3 (8.82 %) verb-to-verb, 1 (2.94 %) adjective-to-noun, and 1 (2.94 %) verb-to-noun. As Figure 5 demonstrates, noun-to-noun substitution outnumbered the frequency. This reveals that the word grammatical class of nouns are more substituted for the same word class, i.e. nouns, although word substitution between different grammatical classes was noted but very infrequently.

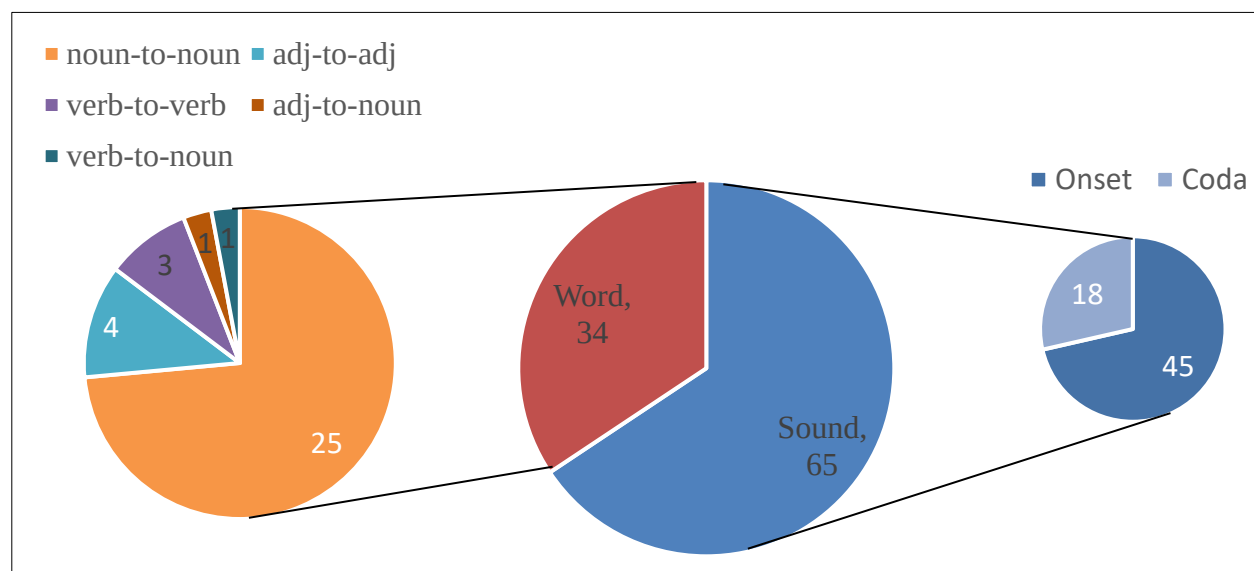


Figure 5. Frequency of substitution types, position of sound substitution, and word substitution

5.4.1 Sound substitution

a. Onset consonant: two sounds in syllable-onset position substitute for each other. This case is illustrative through the example /ʔis.ta:ð wi.sa:m/ 'Teacher Wisam' → /ʔis.ta:ð wi.ʃa:m/. The speaker substitutes the sound /ʃ/ for /s/ in the target name /wi.sa:m/. The sounds /s/ and /ʃ/ are [+voiceless], [+fricative], [+coronal], and [+obstruent], and [+continuant]. Thus, the substitution of /s/ to /ʃ/ is brought about since these two sounds are fricative and their place of articulation is very near to each other, i.e., /s/ is [+alveolar] while /ʃ/ is [+palate-alveolar]. It is necessary to tackle another example that further explains how tongue slips in Iraqi Arabic colloquial speech can also touch initial consonant clusters. In /has.sa has.sa nsaw.wi:ha:/ 'We'll do it now' → /has.sa has.sa nʃaw.wi:ha:/, the second segment /s/ of the initial two-consonant cluster /ns/ in third target word /nsaw.wi:ha:/ is substituted by /ʃ/. This explains that even sound segments of consonant clusters can possibly be slipped.

b. Coda consonant: /tal.mi:h/ 'hint' which is changed into /tal.mi:ʃ/ shows a sound substitution in syllable-coda position. The final sound /ʃ/ of the second syllable is substituted for the initial /h/ in the target /tal.mi:h/. The sounds /h/ and /ʃ/ are likely to substitute for each other since they are both [+pharyngeal] and [+fricative]. Note that the utterance /tal.mi:ʃ/ is meaningful and means 'polishing'. As a result, this could also be a word substitution as a word has been substituted for another word. It is a combination of both kinds of substitution.

c. Geminated sound substitution: in /has.sa/ → /haz.za/, the voiceless geminated /ss/ sound in the target /has.sa/ ‘now’ is substituted by the voiced geminated /zz/, giving rise to produce the meaningful noun /haz.za/ ‘earthquake’. With a gemination intact, and at which the sound substitution occurred, this substitution is triggered by the phonological relation shared between the sounds in the sense that they are both [+obstruent], [+fricative], [+alveolar], and [+anterior], as their place of articulation is exactly the same. Furthermore, it can be interpreted that this substitution is not only a sound substitution but also a word one since the word /has.sa/ is substituted by /haz.za/. So explained, the word substitution taking place simultaneously with the sound substitution indicates a combination of both kinds of substitution tongue slips.

d. Vowel: not only consonant sounds but also vowel sounds can be substituted by other vowel sounds. In /ra.haf/ → /ra.hi:f/, the short open front vowel /a/ in the target name (Rahaf) is replaced by the long close front vowel /i:/, leading to the occurrence of the nonsense /ra.hi:f/.

5.4.2 Word substitution

a. Noun-to-noun substitution: a case of noun substitution is illustrated by the following example. The noun word /ta.hi.da:t/ is substituted for the intended noun word /ta.had.di.ja:t/, since these words are phonologically related to each other or share some phonological similarities which involve similar sounds in the words and somewhat similar syllable structures. Despite being phonologically similar, these words are different in terms of meaning where the intended noun means ‘challenges’ and the utterance ‘selections’ or ‘limitations’.

b. Adjective-to-adjective substitution: in /ʃaj.fi:/ → /ʃa.da.fi:/, the speaker substitutes the adjective /ʃa.da.fi:/ ‘pearly’ for the target adjective /ʃaj.fi:/ ‘summery’. This adjective-to-adjective substitution is because of the sound resemblances in the words. Both begin with /ʃ/ followed by /a/ and both end with the syllable /fi:/.

c. Verb-to-verb substitution: an example of a verb substituted for another verb is demonstrated by the following example. The speaker substitutes the verb /jit.ti.him/ for the intended verb يهتم /jih.tam/. Having similar sounds and pronunciations due to which these words are substituted, they show different meanings. /jit.ti.him/ means “he accuses somebody” while /jih.tam/ means “he cares”.

d. Adjective-to-noun substitution: in /ʃi.bih/ → /ʃa.hib/, the intended adjective /ʃi.bih/ ‘like’ is substituted to the noun /ʃa.hib/ ‘meteor’ or ‘shooting star’. The phonological similarities between the words lead to such a substitution which involves two words belonging to different word classes.

e. Verb-to-noun substitution: in /raq.ʃih/ → /ʃa.rih/, the intended verb /raq.ʃih/ ‘nominate’ is substituted to a noun /ʃa.rih/ ‘explanation’. Again, this substitution is caused by the similar phonological features and sounds between the words belonging to different word classes. This finding, like the previous one in (d), about substituted words belonging to different classes is opposite to a generalisation given by Nooteboom (1969) and Fromkin (1973). So, it seems that it is not a very common pattern to substitute words of different classes in Iraqi Arabic speech.

5.5 Omission

Being the least frequent type of tongue slips, only 4 cases for omission were reported. The following three categories (the fourth one, unexplained in the analysis, being also for coda position like category b below) illustrate omission in Iraqi Arabic speech.

a. Onset deletion and syllable change: in an example like /mus.ta.haq.qa:t/ ‘entitlements’ → /mu.sa.haq.qa:t/, the speaker deleted the initial plosive consonant /t/ in the second syllable /ta/ of the target word, which means ‘entitlements’. The /t/ deletion led the target first-syllable coda /s/ sound to leave its own syllable and join the second syllable, to which it has become an onset, replacing the original /t/ sound. This is done in order not to leave the second syllable without a consonant. This implies that the Iraqi Arabic phonological structure does not allow vowels to stand alone in a syllable; they should be accompanied by consonants. This makes consonants, especially onsets, an essential part in every syllable.

b. Coda deletion: the speaker in /ʕar.ba:.na/ ‘wagon’ → /ʕa.ba:.na/ elided the final post-alveolar consonant /r/ in the first syllable of the target word that carries the meaning ‘a wagon’, leaving the syllable with a zero coda. Such deletion might be caused by the articulatory fact that the alveolar consonant /r/ is articulated with the tongue having a curved shape. It follows that this /r/ articulation is different from the articulation of the voiced pharyngeal fricative /ʕ/ in terms of the tongue being at rest and inactive. /r/ articulation is also different from the articulation of open front vowel /a/, in which the front is raised a little, and is different from the articulation of the voiced bilabial /b/ in which again the tongue is at rest. That being the case, /r/ is elided for the ease of articulation, i.e. to make the articulation between /ʕ/, /a/ and /b/ smooth, without the /r/ sound obstructing or impeding the flow of articulation.

c. Coda deletion and syllable change: in /jiʕ.dʒib.ni:/ ‘I like’ → /ji.ʕidʒ.ni:/, the coda bilabial consonant /b/ is left out unpronounced from the second syllable. This sound deletion has affected the first and second syllable in the sense that the coda consonant /ʕ/ in the first syllable of the target word has shifted its position to the onset of the second syllable already occupied by /dʒ/. What is more is that the vowel /i/ following the consonant /dʒ/ in the second target syllable has moved backward to act as the peak of the syllable, following the consonant /ʕ/. This analysis asserts the fact that no vowel begins a syllable, and that onsets are essential sound segments in every syllable.

5.6 Blends

Like omission, blends are infrequently reported as cases of tongue slips, compared to other types. The following four categories show how blends are made.

a. /xal.fil dʒum.la/ → /xul.fa:/ in this utterance, the prepositional phrase /xal.fil dʒum.la/ ‘beyond the sentence’ is blended into one meaningless word /xul.fa/. The new word is formed by blending /x/ and /l/ of the first syllable /xal/ of the target first word with the vowel /u/ of the first syllable /dʒum/ of the second target word, and the initial consonant /f/ of the second syllable of the first word is mixed with the vowel /a/ of the second syllable of the second target word. It can be seen that the consonants /x/, /l/ and /f/ of the first word are blended with the vowels /u/ and /a/ of the second word, and that, as a result, the new blended word comes to have a syllable structure and a syllable boundary of the second target word.

b. /ʃi.ma:l ja.mi:n/ → /ʃa.mi:n/: the two target words, meaning ‘north right’, are combined together to give a new one that does not exist in Iraqi Arabic colloquial speech. It is made by mixing the first sound

/ʃ/ in the first target word /ʃi.ma:l/ with the rest of the second target word /ja.mi:n/, just occupying and replacing the initial sound /j/ of the first syllable in the second target word.

c. /qi.ja:sw taq.wi:m/ → /taq.wi:s/ and /qi.ja:m/: the phrase /qi.ja:sw taq.wi:m/, meaning ‘measurement and evaluation’, has been slipped twice and differently by two different speakers. The first blended word is /taq.wi:s/, formed by the fusion of the first consonant sound /s/ of the final consonant cluster /sw/ in the second syllable of the first target word /qi.ja:sw/ with the rest of the second target word /taq.wi:m/ but without its final nasal sound /m/. This newly formed word made by having /s/ as a substitute for /m/ means ‘bending’, an actually existing word that did not make sense in the context in which it was used by the Iraqi Arabic speaker. In a rather opposite way, the other word /qi.ja:m/, meaning ‘standing up’ or ‘emergence’, is formed by mixing the final nasal sound /m/ in /taq.wi:m/ with the rest of the first target word /qi.ja:sw/ without the consonant cluster, which is replaced by /m/.

d. /ʃiʃ.ru: lu.ʔa wna.hu/ → /ʃuʔl wna.hu/: in this example, there is a transposition of two segments. The slipped utterance /ʃuʔl/ ‘job’ is formed by blending /ʃ/ in /ʃiʃ.ru:/ with /u/ and /ʔ/ in /lu.ʔa/ and then the first-syllable onset /l/ in /lu.ʔa/ takes the position of the final /a/ in the same target word. Thus, the outcome is blending a consonant with two adjacent sounds across a syllable boundary and with a consonant replacing another vowel. Mention needs to be made of the initial two-consonant cluster /wn/, which has been formed as a result of a vowel elision (a) from the original form /wa na.hu/ ‘and grammar’. The particular fact asserts that the structure of Iraqi Arabic phonology involves also initial two-consonant clusters that can be formed during rapid, casual connected speech.

6. Conclusions

In view of the study findings and discussion, it was found that Iraqi Arabic adult speakers made errors of only six types of tongue slips, which are: anticipation, perseveration, metathesis, substitution, omission and blends. Shift and addition are the two types which were not observed to occur in Iraqi Arabic phonology. The non-occurrence of these two types addresses the newly detected fact in this study that the Iraqi Arabic phonological structure does not seem, when making tongue slips, to allow segments, especially consonants, to be shifted from one syllable position to incorrect one, or to be newly added to other syllable positions to which these segments do not belong. The reason stems out from the interpretation that Iraqi Arabic phonology tends to make sure that there are segments in their own syllable slots and that even their number remains as it is, and therefore no distortions, or new complete alternations, exist in syllables in terms of their structure and number of segments. However, as was found, segments allow substitution, and also anticipation, perseveration, and metathesis, and these latter three involve substitution, too. Segment substitution is generally different from shift, addition and omission. Moreover, the particular finding concerning the least occurring type of tongue slips (i.e. omission) asserts (the newly detected fact) that syllables in Iraqi Arabic phonology are not liable to have new major alternations in syllable structures, or more specifically, to have whole segment transfer, addition or deletion, as deletion leaves a syllable position segment-vacant. In other words, no changes in syllable structures occur as a result of shift and addition, and no frequent ones as a result of deletion.

The study has also observed that not only one but also sometimes more than one type of tongue slips can occur together in the same utterance. Various tongue slips can possibly be involved in one utterance.

As the study has come up with the concluding remark that a single sound segment can be exposed to be slipped in different types of tongue slips even when it is a member of a consonant cluster, this particular fact has led to a new theoretical insight in Iraqi Arabic colloquial speech and has given confirmation to a particular phonological aspect. It has confirmed the existence of initial two-consonant clusters formed not only by /td/, /mr/, /dr/, and /tl/, as suggested by Al-Bazi (2006), but also by /ʃs/ (see second example of 5.1 a), /mn/ (see example 5.1 c), /ns/ (see second example of 5.4.1 a), and /wn/ (see example 5.6 b). These four latter clusters are formed by phonological processes in connected speech such as elision. But the question is: are there any other two-segment combinations that form initial two-consonant clusters? To solve this issue, it is recommended that future researchers consider examining new segments that form such clusters.

Sound segments of initial-two consonant clusters can themselves be affected, slipped, and changed; some others can be the source of slipping or affect other neighbouring sounds, leading them to slip and change in different types of tongue slips. Similarly, final-two consonant clusters can also be involved in tongue slipping. However, the study has come up with a new phonological aspect that whole initial or final two-consonant clusters in Iraqi Arabic colloquial speech tend not to slip; whole clusters, or the two adjacent segments in a cluster, are not disposed to be slipped together at the same time, i.e., anticipated, perseverated, etc. Additionally, in Iraqi Arabic colloquial speech, not only single onset or coda segments get slipped but also whole syllables – where they may be transposed – and words which blend or substitute. With respect to geminate sound segments, it has been concluded that when geminate sounds are substituted for other sounds, the latter are also geminated. This indicates that when a geminate sound segment is for instance anticipated or metathesised or substituted by a single sound segment, the latter is affected by the position of the geminate sound segment and thus takes gemination. This implies that gemination is a vital characteristic in Iraqi Arabic phonology.

As far as sound segments and syllable structures are still concerned, the study has reached a confirmatory viewpoint on that fact that vowels in Iraqi Arabic phonology do not stand alone as single sound segments in any syllable structure; they are always surrounded and accompanied by consonants. Furthermore, vowels do not begin a syllable. This fact implies that onset consonants are an indispensable part in every syllable.

Additionally, one concluding remark validating the study's hypotheses is that slips of the tongue are not made on a random basis; rather, they are made regularly as consonants slip with consonants and vowels with vowels. The specific function of consonants and vowels make tongue slips occur so. It follows that as sounds get metathesised or substituted or undergo any other type of tongue slips and as words and phrases with similar sounds interfere and mix, the systematic phonological structure of the language remains somewhat intact. Thus, tongue slips are regular and systematic patterns in one's speech, based on several linguistic and phonological rules and associations, and they do not often cause major changes in syllable structures of the slipped utterances. Strong evidence that can be provided for errors occurring non-randomly is the order of sounds slipped in different syllable positions.

It is also validated that tongue slips are predictable. Speakers can identify the type of error produced as well as the syllable position in which the error has been made. This is due to the speaker's internalised knowledge of the systematic organization of the sounds and of the phonology of the language in general. When sounds get misplaced, a tongue slip is produced, but the tongue slip still follows certain phonological rules.

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Appendix: Speech Errors Collected

A. Anticipation Errors

	Utterance	Target	Meaning	Syllable Structure
1	مايو ميكانيك /ma:.jo:.mi:.ka:.ni:k/	بايو ميكانيك /ba:.jo:.mi:.ka:.ni:k/	Biomechanics	onset-onset
2	عَرَكَةُ الْعَضَلَاتِ /ʕa.rak.til ʕa.ɖa.la:t/	حَرَكَةُ الْعَضَلَاتِ /ha.rak.til ʕa.ɖa.la:t/	muscle contraction	onset-onset
3	دَجَائِنِ /dʒa:.dʒi.ʔi:n/ جَائِنِ	لَجَائِنِ /la:.dʒi.ʔi:n/ لاجئين	refugees	onset-onset
4	لعد منو يأخذ مشائي إنشاء؟ /la.ʕad mi.nu: ja:xð ma.ʕa:.ʔi ʔin.ʕa:ʔ/	لعد منو يأخذ مسائي إنشاء؟ ma.sa:.ʔi /la.ʕad mi.nu: ja:xð ʔin.ʕa:ʔ/	Then who will teach composition in the evening study?	onset-onset

5	بلكي كان سي سلبلي؟ /bal.ki: ka:n si: sil.bi:/	بلكي كان شي سلبلي؟ /bal.ki: ka:n ji: sil.bi:/	What if it was something negative?	onset-onset
6	ما سفت شسوا؟ /ma: sift fsaw.wa/	ما شفت شسوا؟ /ma: jift fsaw.wa/	Did not you see what he did?	onset-onset
7	سَبَاب، سَجَلُوا أَسْمِي. /sa.ba:bb sadʒ.dʒi.lu: ʔis.mi:/	سَبَاب، سَجَلُوا أَسْمِي. ʔis.mi:/ /ʃa.ba:bb sadʒ.dʒi.lu:	Guys, write my name.	onset-onset
8	هَسَّة أَشُوف /haʃ.ʃa ʔa.ʃu:f/	هَسَّة أَشُوف /has.sa ʔa.ʃu:f/	I'll see now.	onset-onset
9	أَكْبَارُ مَكْبُوتَة /ʔak.ba:r mak.bu:.ta/	أَفْكَارُ مَكْبُوتَة /ʔaf.ka:r mak.bu:.ta/	supressed thoughts	coda-coda
10	بَلْمِيلْ /bal.mi:l/	بَرْمِيلْ /bar.mi:l/	barrel	coda-coda
11	هل راح يشبح البحث كله. /ha:.ða ra:h jif.bahl baħθ kil.la/	هل راح يشبه البحث كله. /ha:.ða ra:h jif.bahl baħθ kil.la/	This will resemble the whole research. anticipation	coda-coda
12	الموضوع كلش زين. /ʔil.maw.ðu:f kil.liʃ ze:n/	الموضوع كلش زين. /ʔil.maw.ðu:f kil.liʃ ze:n/	The topic is very good.	coda-coda
13	مَغْزَرْ /may.zaz/	مَخْبِزْ /max.baz/	bakery	onset-coda
14	مَنْطَطْ /mnaʔ.tat/	مَنْقَطْ /mnaq.qat/	spotted	onset-coda
15	فوف! /ʃu:f/	شوف! /ʃu:f/	See!	onset-coda
16	نَمْنْ /nim.man/	تَمْنْ /tim.man/	rice	onset-coda
17	إِعْلَاء رَنِّيبي /ʔiʕ.la:ʔ ra.ʔi:..si:/	إِعْلَان رَنِّيبي /ʔiʕ.la:n ra.ʔi:..si:/	official advertisement	coda-onset
18	أَكْتَم مَقْدِمَة mu.qad.di.ma/ /ʔik.tim	أَكْتَب مَقْدِمَة mu.qad.di.ma/ /ʔik.tib	write an introduction	coda-onset
19	شَحْم مَوْبَايل /ʃaħm mu:ba:il/	شَحْن مَوْبَايل /ʃaħn mu:ba:il/	phone charging	coda-onset

	/faħm mu:.ba:.jil/	/faħn mu:.ba:.jil/		
20	/ʕad.mil عَظْمُ العَضْدِ ʕa.did/	/ʕað.mil ʕa.did/ عَظْمُ العَضْدِ	humerus	coda-onset

B. Perseveration Errors

	Utterance	Target	Meaning	Syllable Structure
1	/ʔis.tin.ta:x/ استنتاخ	/ʔis.tin.sa:x/ استنساح	Xerox	onset-onset
2	بَوَابَاتُ بِيبي /baw.wa:.ba:t be:.bi:/	بَوَابَاتُ بِيجي /baw.wa:.ba:t be:.dʒi:/	gates of Beji (city)	onset-onset
3	/θa.la:.θi:m.ja/ ثلاثيميا	/θa.la:.si:m.ja/ ثلاثيسيميا	thalassemia	onset-onset
4	شَوِّفِ السُّوَال /ʃu:.fiʃ.ʃu.ʔa:l/	شَوِّفِ السُّوَال /ʃu:.fis.su.ʔa:l/	check out the question	onset-onset
5	غِيمَرُ عَمَرُ /ge:.mar ʕa.mar/	غِيمَرُ عَرَبُ /ge:.mar ʕa.rab/	Arab cream (a semi-solid cream substance)	onset-onset
6	كنت أخذت إجابة /kint ʔi.xa.ðt ʔi.dʒa:.dʒa/	كنت أخذت إجازة /kint ʔi.xa.ðt ʔi.dʒa:.za/	You had to take a leave.	onset-onset
7	لازم تطلع توية قبل. /la:zm tiʔ.laʃ twaj.ja qa.bil/	لازم تطلع شوية قبل. /la:zm tiʔ.laʃ fwaj.ja qa.bil/	You should leave earlier.	onset-onset
8	هَسَّةَ لازم تجيب الجيئة. /has.sa la:zm ʔidʒ.dʒe:.bil dʒe:.ta/	هَسَّةَ لازم تجيب الديئة. ʔidʒ.dʒe:.bil /has.sa la:zm de:.ta/	You should now bring the data.	onset-onset
9	أَيَّامُ زِيَّامُ /ʔaj.ja:m zi.ja:m/	أَيَّامُ زَمَانُ /ʔaj.ja:m za.ma:n/	past days	coda-coda
10	جيش عَشْكَري	جيش عَسْكَري	military army	coda-coda

	/dʒeːf ʕaf.ka.ri/	/dʒeːf ʕas.ka.ri/		
11	/muʃ.miʃ/ مُشْمَشْ	/muʃ.mis/ مُشْمَسْ	sunny	coda-coda
12	لازم تعرف أش ينقص /la:zm tiʕ.rif ʔaʃ jin.qaʃ/	لازم تعرف أش ينقص /la:zm tiʕ.rif ʔaʃ jin.qaʃ/	You have to know what lacks	coda-coda
13	إذا أنا أعرف أنه الموضوع يناسبني، راح أكمل البحث. /ʔi.ða ʔana: ʔaʕ.rif ʔinnu: ʔilmaw.ðu:ʕ jna:..sib.ni: ra:h ʔa.kam.mi.lil baʕθ/	إذا أنا أعرف أنه الموضوع يناسبني، راح أكمل البحث. /ʔi.ða ʔana: ʔaʕ.rif ʔinnu: ʔilmaw.ðu:ʕ jna:..sib.ni: ra:h ʔa.kam.mi.lil baħθ/	If I know that the topic is suitable for me, I'll complete the research.	coda-coda
14	البارحة رحت نحت. /ʔil.ba:r.ħa riħt niħt/	البارحة رحت نمت. /ʔil.ba:r.ħa riħt nimt/	Yesterday, I went to sleep.	coda-coda
15	/ʃi.ju:ʃ/ شيوخ	/ʃi.ju:x/ شيوخ	senators	onset-coda
16	لمن يجي التحديث /lim.man ji.dʒi: ʔit.taħ.di:dʒ/	لمن يجي التحديث /lim.man ji.dʒi: ʔit.taħ.di:θ/	when the update comes	onset-coda
17	لازم استضافة /la:zm ʔis.ti.za:.fa/	لازم استضافة /la:zm ʔis.ti.ða:.fa/	It should be hosting	coda-onset
18	أخذتني النسخة مال القصة؟ /ʔa.xað.ti: ʔin.nis.xa ma:l qiʃ.la /	أخذتني النسخة مال القصة؟ /ʔa.xað.ti: ʔin.nis.xa ma:l qiʃ.sa /	Did you get the copy of the story?	coda-onset
19	لازم تعرف أنه كلام موثق. /la:zm tiʕ.rif ʔinnu: ka.la:m mwaf.faq/	لازم تعرف أنه كلام موثق. /la:zm tiʕ.rif ʔinnu: ka.la:m mwaθ.θaq/	You should know it is a documented speech.	coda-onset
20	/ka.las.jo:m/ كالسيوم	/ka.lis.jo:m/ كالسيوم	calcium	vowel

C. Metathesis Errors

Utterance	Target	Meaning	Syllable Structure
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1	/par.ma.la:n/ پَرْمَلان	/par.la.ma:n/ پَرْلَمَان	parliament	onset-onset
2	/ta.qa:ʕud/ تَقَاعُد	/ta.ʕa:qud/ تَعَاقُد	contract	onset-onset
3	/za.dʒi:l الشُّكْر ʔif.fu.kir/ رَجِيل	/dʒa.zi:l ʔif.fu.kir/ جَزِيل الشُّكْر	thanks a lot	onset-onset
4	/haf.ʂa/ حَفْصَة	/ʂaf.ha/ صَفْحَة	page	onset-onset
5	/ʕa:fi.ʂa/ عَافِصَة	/ʕa:ʂi.fa/ عَاصِفَة	storm	onset-onset
6	/ʕa.wa:la/ عَوَالَة	/ʕa.la:wa/ علاوة	bonus	onset-onset
7	/ʕi.ja:na/ عِيَانَة	/ʕi.na:ja/ عِنَايَة	concern	onset-onset
8	/fal.fa.sa/ فَلَافْسَة	/fal.sa.fa/ فَلَافْسَة	philosophy	onset-onset
9	/fal.fa.si/ فَلَافْسِي	/fal.sa.fi/ فَلَافْسِي	philosophical	onset-onset
10	/ma.qar/ مَقَر	/qa.mar/ قَمَر	moon	onset-onset
11	/qa.na:wi:n/ قَنَافِين	/qa.wa:ni:n/ قَوَانِين	rules	onset-onset
12	/ka.va.ra:na:t/ كَفَارَات	/ka.ra.va:na:t/ كَارِافَات	caravans	onset-onset
13	/mas.ha.rij.ja/ مَسْحَرِيَة	/mas.ra.hij.ja/ مَسْرَحِيَة	a play	onset-onset
14	/mu.ʕa:da.ra/ مُعَاضَرَة	/mu.ʕa:ra.da/ مُعَارَضَة	objection	onset-onset
15	/mu.la:ka.ma/ مُلَاكَمَة	/mu.ka:la.ma/ مُكَالَمَة	phone call	onset-onset
16	/mal.su:ma/ مَلْسُومَة	/mal.mu:sa/ مَلْمُوسَة	tangible	onset-onset
17	/si.ni.ma:ra:t/ سَنَمَارَات	/si.mi.na:ra:t/ سَمَنَارَات	seminars	onset-onset
18	/taw.ʕi:qa:t/ تَوَعِيقَات	/taw.qi:ʕa:t/ تَوَقِيعَات	signatures	onset-onset
19	/mu.xal.la.ʂa:t/ مُخَلَّصَات	/mu.lax.xa.ʂa:t/ مُلَخَّصَات	summary	onset-onset
20	/fal.la:t/ فَلَافَات	/laf.fa:t/ لَفَافَات	sandwiches	onset-onset
21	/tar.ru:na/ تَرَوْنَة	/tan.nu:ra/ تَنُورَة	skirt	onset-onset
22	/ma.za:dzij.ja/ مَرَاجِيَة	/ma.dʒa:zij.ja/ مَجَازِيَة	figurative	onset-onset
23	تفاضل وتماكل /ta.fa:duɫw ta.ma:kul/	تفاضل وتكامل /ta.fa:duɫw ta.ka:mul/	calculus	onset-onset
24	/ma.dʒa:ʕa/ مَجَاعَة	/dʒa.ma:ʕa/ جَمَاعَة	a group of people	onset-onset

25	/may.lab/ مَعْلَبْ	/mab.lay/ مَبْلَعْ	a sum of money	coda-coda
26	/mudʒ.ʕiz/ مُجْعَزْ	/muz.ʕidʒ/ مُزْعَجْ	annoying	coda-coda
27	/muf.rif/ مُفْرَشْ	/muʃ.rif/ مُشْرِفْ	supervisor	coda-coda
28	/ʃah.ba/ صَحْبَة	/haʃ.ba/ حَصْبَة	measles	onset-coda
29	/mis.mis/ مُسْمِسْ	/sim.sim/ سَمْسِمْ	sesame	onset-coda
30	/sa.ri:m/ سَرِيمْ	/sa.mi:r/ سَمِيرْ	Samir (name)	onset-coda
31	/xaʃ.ta/ خَشْطَة	/ʃax.ta/ شَخْطَة	a scratch	onset-coda
32	/ʕa.sik/ عَاسِكْ	/ʕa.kis/ عَاكِسْ	reflective	onset-coda
33	/lidʒ.dʒa.ʕi:m/ لِلْجَعِيمْ	/lidʒ.dʒa.mi:ʕ/ لِلْجَمِيعْ	for everyone	onset-coda
34	/mis.taw.ʕiʃ/ مُسْتَوْفَصْ	/mis.taw.ʕiʃ/ مُسْتَوْصَفْ	dispensary	onset-coda
35	/muʃ.ta.hab/ مُشْتَهَبْ	/muʃ.ta.bah/ مُشْتَبَهْ	suspected	onset-coda
36	/ma.ʃa:w.la/ مَصَاوِلَة	/ma.wa:ʃ.la/ مَوَاصِلَة	Mosuli people	onset-coda
37	/ji.kih/ يَكْحْ	/ji.hik/ يَحْكْ	it scratches	onset-coda
38	بيِّنَاتُهُمْ شَاعِرْ. /be:.na:t.hum ʃa:.ʕir/	بيِّنَاتُهُمْ شَارِعْ. /be:.na:t.hum ʃa:.riʕ/	Among them is a street.	onset-coda
39	/ʔar.zaʕ/ أَرْزَقْ	/ʔaz.raʕ/ أَزَرَقْ	blue	coda-onset
40	/ʔir.ʕid/ أَرْفَضْ	/ʔif.rid/ أَفْرَضْ	impose	coda-onset
41	/tidʒ.raʕ/ تَجَرَعْ	/tir.dʒaʕ/ تَرَجَعْ	she returns	coda-onset
42	/tak.ʕi:r/ تَكْفِيرْ	/taʕ.ki:r/ تَفْكِيرْ	thinking	coda-onset
43	/taz.wi:ʕ/ تَرْوِيعْ	/taw.zi:ʕ/ تَوَزِيعْ	distribution	coda-onset
44	/dʒim.sij.ja/ جَمْسِيَّة	/dʒis.mij.ja/ جَسْمِيَّة	bodily	coda-onset
45	/dʒuʕ.ma/ جُمُعَة	/dʒum.ʕa/ جُمُعَة	Friday	coda-onset
46	/ʔiʃ.ʃaw.ka/ الشُّوْكَة	/ʔiʃ.ʃak.wa/ الشُّكْوَى	the complaint	coda-onset
47	/ma.l.ʕu:.ma/ مَلْعُومَة	/maʕ.lu:.ma/ مَعْلُومَة	a piece of information	coda-onset
48	/nas.ʕi:/ نَسْفِيْ	/naʕ.si:/ نَفْسِيْ	myself	coda-onset

49	/sa:d.na/ سَادَنَة	/sa:n.da/ سَانَدَة	supportive	coda-onset
50	/ʕa:j.fa/ عَافِيَة	/ʕa:f.ja/ عَافِيَة	health	coda-onset
51	/θaw.ra/ ثَوْرَة	/θar.wa/ ثَرَوَة	wealth	coda-onset
52	/hi.sa:.ba:t/ حَسَابَات	/ha:.si.ba:t/ حَاسِبَات	computers	vowel

D. Substitution Errors

D.1 Sound Substitution Errors

	Utterance	Target	Meaning	Syllable Position
1	إذا تحتاج سي، كلي. tiħ.tadz si: gil.li:/ʔi.ða	إذا تحتاج شي، كلي. tiħ.tadz fī: gil.li:/ʔi.ða	If you want anything, tell me.	onset
2	/ʔar.ra.ħi:m/ الرَّحِيم	/ʔar.ra.dʒi:m/ الرَّحِيم	merciful	onset
3	/ʔam.fī.la/ أمثلة	/ʔam.θi.la/ أمثلة	examples	onset
4	/ʔaw.ʂaʕ/ أَوْسَع	/ʔaw.saʕ/ أَوْسَع	widest	onset
5	/ħaʃ.fu:n/ حَسُون	/ħas.su:n/ حَسُون	Hassoon (nickname)	onset
6	/mu:.te:l/ موتيل	/hu:.te:l/ هوتيل	hotel	onset
7	/mo:.sil/ موصل	/mo:.ʂil/ موصل	Mosul (city)	onset
8	/sa.la:.hid.di:n/ سلاح الدين	/ʂa.la:.hid.di:n/ صلاح الدين	Salahaddin (city)	onset
9	/sa.qa:.fa/ سَقَافَة	/θa.qa:.fa/ ثَقَافَة	culture	onset
10	/ta.ra/ طَرَى	/ta.ra/ تَرَى	I will	onset
11	/saj.tu:n/ سيتون	/zaj.tu:n/ زيتون	olive	onset
12	/saj.da.lij.ja/ سَيْدَلِيَّة	/ʂaj.da.lij.ja/ صَيْدَلِيَّة	pharmacy	onset
13	/taw.si:l/ تَوَسِيل	/taw.ʂi:l/ تَوْصِيل	delivery shipping	onset
14	/tan.dʒa.ra/ تَنْجَرَة	/tan.dʒa.ra/ طَنْجَرَة	pot	onset
15	/nʔu:l/ نَقُول	/nqu:l/ نقول	we say	onset

	Utterance	Target	Meaning	Syllable Position
16	/ba.tal/ بَتَلْ	/ba.ʔal/ بَطَلْ	hero	onset
17	/mad.dʒa.sa/ مَدَجَسَة	/mad.ra.sa/ مَدْرَسَة	school	onset
18	/me:.tap/ مَيْتَبْ	/me:.kap/ مَيْكَبْ	makeup	onset
19	/ʕa.zal/ عَزَلْ	/ʕa.sal/ عَسَلْ	honey	onset
20	/si:/ سِي	/ʃi:/ شِي	something	onset
21	/slo:n/ سَلُونْ	/ʃlo:n/ شَلُونْ	how	onset
22	/si.nu:ʔ/ سَنُو؟	/ʃi.nu:ʔ/ شَنُو؟	What?	onset
23	/swaj.ja/ سَوَيَّْةْ	/ʃwaj.ja/ شَوَيَّْةْ	a little	onset
24	/sak.ku:.ta/ سَكَّوْتَة	/sat.tu:.ta/ سَتَّوْتَة	rickshaw	onset
25	/ʃa.na/ شَنَّةْ	/sa.na/ سَنَّةْ	year	onset
26	/ham ðe:n/ هَمْ ذِينْ	/ham ze:n/ هَمْ زِينْ	It's good too.	onset
27	هَسَّةْ هَسَّةْ نَشَوِيهَا. has.sa /has.sa nʃaw.wi:ha:/	هَسَّةْ هَسَّةْ نَسَوِيهَا. has.sa nsaw.wi:ha:/ has.sa/	We'll do it now.	onset
28	بَسْ أَهَمْ تِي هَذَا. /bas ʔa.ham ti: ha:.ða/	بَسْ أَهَمْ شِي هَذَا. /bas ʔa.ham ʃi: ha:.ða/	But the most important is this.	onset
29	الأجاديمية /ʔil.ʔa.dʒa:.di:.mij.ja/	الأكاديمية /ʔil.ʔa.ka:.di:.mij.ja/	academics	onset
30	/ʔa.dʒi:s/ أَجِيسْ	/ʔa.qi:s/ أَقِيسْ	I measure	onset
31	/fa.hal/ فَحَلْ	/ma.hal/ مَحَلْ	shop	onset
32	/ʔin.gi.ri:.zi:/ انْكِرِيزِي	/ʔin.gi.li:.zi:/ انْكِلِيزِي	English	onset
33	/ʔaz.ze:t.ni:/ أَرَبْتَنِي	/ʔað.ðe:t.ni:/ أَدَبْتَنِي	You hurt me.	onset
34	/bat.ta:.rij.ja/ بَتَّارِيَّةْ	/baʔ.ta:.rij.ja/ بَطَّارِيَّةْ	battery	onset

	Utterance	Target	Meaning	Syllable Position
35	/ħam.ma:.wi/ حَمَّاوي	/ħam.ma:.di/ حَمَّادي	Hammadi (name)	onset
36	/fa.ʃa:d/ فَشَاد	/fa.sa:d/ فَسَاد	corruption	onset
37	/ma:.ʔij.ja/ مَائِيَّة	/ma:.lij.ja/ مَالِيَّة	finance	onset
38	/na.kil/ نَكَل	/na.qil/ نَقْل	transfer	onset
39	/ʔi.ba:.da/ إِبَادَة	/ʔi.ba:.na/ إِبَانَة	Ebana (name)	onset
40	/haz.za/ هَزَة	/has.sa/ هَسَة	now	onset
41	/θa.la:m/ ثَلَام	/sa.la:m/ سَلَام	Salam (name)	onset
42	/fal.la:.dʒa/ فَلَاجَة	/θal.la:.dʒa/ ثَلَاجَة	fridge	onset
43	/ma.ka:.ʃib/ مَكَاشِب	/ma.ka:.sib/ مَكَاسِب	gains	onset
44	/ʔis.ta:ð wi.ʃa:m/ استاذ وشام wi.ʃa:m/	/ʔis.ta:ð wi.sa:m/ استاذ وسام	teacher Wisam	onset
45	/ʔil.far.ʃa/ الْفَرَعَة	/ʔil.far.ha/ الْفَرَحَة	the joy	onset
46	لا يحب ولا يدب /la: jihb wla: jidb/	لا يهب ولا يدب /la: jihb wla: jidb/	someone useless idiom)	coda
47	/tal.mi:ʕ/ تَلْمِيع	/tal.mi:h/ تَلْمِيح	hint	coda
48	/ʔiʃ.ne:n/ اثنين	/ʔiθ.ne:n/ اثنين	two	coda
49	/na:zm/ نازم	/na:ðm/ ناظم	Nathem (name)	coda
50	/do:r.ma/ دورمة	/do:l.ma/ دولمة	dulma (food)	Coda
51	/ʔaq.sa:t/ أقسات	/ʔaq.sa:t/ أقساط	installments	coda
52	/ʔadʒ.wa:t/ أجوات	/ʔaʃ.wa:t/ أصوات	sounds	coda
53	/bans.la:.wa/ بَنْسَلَاوَة	/banʃ.la:.wa/ بَنْسَلَاوَة	Bansalawa (city)	coda
54	/ʔixð sidʒri:n/ أَخْذْ سَجْرِين	/ʔixð sik.ri:n/ أَخْذْ سَكْرِين	screen	coda
55	/ʔixd/ اخض	/ʔixð/ اخذ	take	coda

	Utterance	Target	Meaning	Syllable Position
56	/ʔit.ris/ اترس	/ʔid.ris/ ادرس	study	coda
57	/dʒi:.bil bu.tur/ جيبى البُطُر	/dʒi:.bil bu.tul/ جيبى البُطْل	bring me the bottle	coda
58	/ʔa.ħib.biʃ/ أَحْبَشْ	/ʔa.ħib.biʃ/ أَحْبَجْ	I love you	coda
59	/ʕaʃ.riθ.ni:n/ عَشْرَ ثَنِينَ	/ʕaʃ.ris.ni:n/ عَشْرَ سَنِينَ	ten years	coda
60	/fa:sl/ فَاسِلْ	/fa:ʃl/ فَاشِلْ	loser	coda
61	/ʃa:sʕ/ شَاسِعْ	/ʃa:ʔʕ/ شَاسِعْ	common	coda
62	/ʃa.ʔif/ شَظْفْ	/ʃa.ʔib/ شَظْبْ	crossing out	coda
63	/ħa.das/ حَدَسْ	/ħa.daθ/ حَدَثْ	event	coda
64	/bi.raħ.ma.ti.ha:/ بِرَحْمَتِهَا/	/bi.raħ.ma.ti.hi:/ بِرَحْمَتِهِ/	by His Mercy	vowel
65	/ra.hi:f/ رَهيفْ	/ra.haf/ رَهْفْ	Rahaf (name)	vowel

D.2 Word Substitution Errors

	Utterance	Target	Meaning	Type
1	/nawm/ نَوْمْ	/nu:n/ نون	Alphabetical letter n	noun-noun
2	/ʔis.til.ha:.ba:t/ اسْتَلْهَابَاتْ	/ʔil.ti.ha:.ba:t/ الْتِهَابَاتْ	infections	noun-noun
3	/ʔif.ra:t/ إِفْرَاطْ	/ʔaʔ.ra:f/ أَطْرَافْ	sides	noun-noun
4	الكِفَايَاتِ الْعِلْمِيَّةِ /ʔil.ki.fa:.ja:.til ʕil.mij.ja/	الْكِفَاءَاتِ الْعِلْمِيَّةِ /ʔil.ka.fa:.ʔa:til ʕil.mij.ja/	scientific efficiency	noun-noun
5	/ʔil.ka.la:m/ الْكَلَامْ	/ʔis.sa.la:m/ السَّلَامْ	peace	noun-noun
6	/ʔil.ka.la:m/ الْكَلَامْ	/ʔil.ma.ka:n/ الْمَكَانْ	the place	noun-noun
7	/taħ.di:.da:t/ تَحْدِيدَاتْ	/ta.ħad.di.ja:t/ تَحْدِيَّاتْ	challenges	noun-noun
8	/ħa:s.sit.ha:/ حَاسَتِهَا/	/ħa:.lit.ha:/ خَالَتِهَا/	her condition	noun-noun

9	/mu.ħa:.da.ra/ مُحَاَصِرَة	/mu.la:.ħa.ða/ مُلَاخِظَة	note	noun-noun
10	/raf.wa/ رَشْوَة	/war.ʃa/ وَرْشَة	workshop	noun-noun
11	/li:z/ ليز	/ri:lz/ ريلز	reels	noun-noun
12	/mu.ba:.ʃa.ra/ مباشرة	/mu.ʃa:.ha.da/ مشاهدة	observation	noun-noun
13	/ba:b/ بَاب	/ki.ta:b/ كِتَاب	book	noun-noun
14	/taj.si:r/ تيسير	/si:.ri:n/ سيرين	Sireen (name)	noun-noun
15	/lo:.fa/ لَوْفَة	/laf.fa/ لَفَة	a sandwich	noun-noun
16	/mu.ða:.ha.ra/ مُظَاهِرَة	/mu.ħa:.da.ra/ مُحَاَصِرَة	lecture	noun-noun
17	/qa.ʃaʃ/ قَفَص	/qa.ʃif/ قَصِف	bombardment	noun-noun
18	/sar.ħij.ja/ سَرِحِيَّة	/siħ.rij.ja/ سَحْرِيَّة	magical	noun-noun
19	/fu.ru:q/ فُرُوق	/fa.ri:q/ فَرِيق	team	noun-noun
20	مَسْرَحِيَّةٌ وَشَعْرِيَّةٌ /mas.raħij.jaw ʃaħ.rij.ja/	مَسْرَحِيَّةٌ وَشَعْرٌ /mas.ra.ħij.jaw ʃi.ħir/	drama and poetry	noun-noun
21	/ʃaj.da.lij.ja/ صيدلية	/mis.taw.ʃif/ مَسْتَوْصِف	dispensary	noun-noun
22	/kin.ni/ كِنِي	/ħa.mi/ حَمِي	mother-in-law	noun-noun
23	/dʒa.ma:.ʃa/ جَمَاعَة	/dʒa:.mi.ʃa/ جَامِعَة	university	noun-noun
24	/ta:d.ri:b/ تَدْرِيب	/ta:r.ti:b/ تَرْتِيب	ranking/order	noun-noun
25	/na:.di:n/ نادين	/li:n/ لين	Leen (female name)	noun-noun
26	/ʔil.fið/ الْفِظ	/ʔif.rið/ أَفْرَض	impose	verb-verb
27	/jit.ti.him/ يَتَّهِم	/jih.tam/ يَهْتَم	he cares	verb-verb
28	/jab.ni:/ يَبْنِي	/ji.nam.mi:/ يَنْمِي	he fosters	verb-verb
29	تَرْبِيَّةٌ سِيَاسِيَّةٌ /si.ja:.sij.ja tar.bi.ja/	تَرْبِيَّةٌ أَسَاسِيَّةٌ /ʔa.sa:.sij.ja tar.bi.ja/	basic education	adj-adj
30	/ʃa.da.fi:/ صَدْفِي	/ʃaj.fi:/ صَيْفِي	summery	adj-adj
31	/muf.rad/ مُفْرَد	/muθ.bat/ مُثَبَّت	affirmative	adj-adj

32	المفصول كل هاي الكتب تصوير بالإيميل. /ʔil.maf.ʃu:l kil ha:jil ku.tu.bitʃi:r bil.ʔi:.me:l/	المفروض كل هاي الكتب تصوير بالإيميل. /ʔil.maf.ru:ð kil ha:jil ku.tu.bitʃi:r bil.ʔi:.me:l/	All these letters should be sent by e- mail.	adj-adj
33	/ʃa.hib/ شَهَبْ	/ʃi.bih/ شَبْهْ	like	adj-noun
34	/ʃa.rih/ شَرَحْ	/raf.ʃih/ رَشَحْ	nominate	verb-noun

E. Omission Errors

	Utterance	Target	Meaning
1	/mu.sa.ħaq.qa:t/ مُسَحَقَاتْ	/mus.ta.ħaq.qa:t/ مُسْتَحَقَاتْ	entitlements
2	/ʕa.ba:.na/ عِبَانَة	/ʕar.ba:.na/ عَرَبَانَة	wagon
3	/ka:.to:n/ كَاثُونْ	/ka.r.to:n/ كَارْتُونْ	cartoon
4	/ji.ʕidʒ.ni:/ يَعْجَنِي	/jiʕ.dʒib.ni / يَعْجِبُنِي	I like

F. Blends Errors

	Utterance	Target	Meaning
1	/ta.mi:n/ تَمِينْ	/tim.manw taʃ.ri:p/ تَمَن و تَشْرِيبْ	rice and soup
2	/xul.ʕa/ خُلْفَة	/xal.fil dʒum.la/ خَلْف الْجُمْلَة	beyond the sentence
3	/ʃu.ɣa/ شُغْل وَخُو wna.hu/	/ʃi.ʕriw lu.ɣa wna.hu/ شِعْر وَلُغَة وَخُو	poetry, language and grammar
4	/ʃa.mi:n/ شَمِينْ	/ʃi.ma:l ja.mi:n/ شِمَال يَمِينْ	north right
5	/taq.wi:s/ تَقْوِيسْ	/qi.ja:sw taq.wi:m/ قِيَاس وَتَقْوِيمْ	measurement and evaluation
6	/qi.ja:m/ قِيَامْ	/qi.ja:sw taq.wi:m/ قِيَاس وَتَقْوِيمْ	measurement and evaluation