

Improving EFL Learners' Speech Segmentation Skills: The Impact of Connected Speech Instruction on Speech Perception and Listening Comprehension

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ABSTRACT

Language education methodology has evolved in a quest for better bridging the gap between language teaching in educational institutions and language acquisition in the real world. Given the primacy of the oral form of language, addressing this disconnect in speaking and listening instruction merits special emphasis. Learning the English language entails awareness of the segments (the sounds in the phonological system), the supra-segmental features (stress, intonation, and rhythm), and the phonotactics (the possible sound sequences and the processes the sounds undergo in natural language use). In developing phonological awareness in learners of English as an additional language, it is how words learned in citation form—in isolation—morph when used in natural rapid speech that is often overlooked. A body of research has explored the effect of teaching features of connected speech on improving learners' speech production. The present study aims to investigate this impact on speech perception (decoding streams of spoken language). Towards this end, 35 adult Moroccan intermediate EFL learners' connected speech decoding skills were assessed. These learners' spoken-word recognition and listening comprehension proficiency were gauged prior to and after six weeks of instruction in features of connected speech—linking, assimilation, elision, and weak (reduced) forms—through listening comprehension and gapped dictation tests. The statistical analyses indicate significant differences between pretest and posttest scores in both listening comprehension and dictation, reflecting considerable gains in speech segmentation ability. These results afford actionable insights for classroom practice, syllabus design, and assessment frameworks. Raising awareness of rapid and fluent speech processes through integrating features of connected speech in listening comprehension instruction can alleviate speech perception challenges for EFL learners and improve their communicative competence.

Keywords: language education; language acquisition; teaching listening; connected speech; listening comprehension; assimilation; linking; elision; epenthesis; weak forms

INTRODUCTION

The acquisition-learning hypothesis in Krashen's theory of second language acquisition (SLA) has received much attention for decades and is still taught as part of applied linguistics courses. According to Krashen (1982), acquisition of a second language (L2) is a subconscious process stemming from meaningful interaction in a natural setting, akin to children acquiring a first language (L1). Learning, on the other hand, refers to the conscious internalizing of a second language rules through formal instruction. Still, Krashen notes that acquisition is more important than learning. It is the impossibility of fully replicating the natural context of language acquisition in a classroom that leads to limitations in L2 learners' competence (knowledge of the language) and performance (use of the language). Most successful learners are those who have experiences using the language for daily communicative interaction beyond the classroom (Lightbown & Spada, 2013). This view echoes the cognitive linguistics usage-based perspective positing that language is learned through meaningful use and that linguistic units (patterns) are abstracted from usage events (Langacker, 2009). In the EFL context, however, the lack of opportunities for learners to meaningfully use English in a natural setting is a major hindrance to their language proficiency development.

The amount, frequency, and variety of input to which first language (L1) learners of English are exposed cannot be reproduced in a classroom. Particularly, in English as a foreign language (EFL) context, English is barely used beyond the classroom. And, for teaching purposes, language is segmented for analysis, and the rules that govern it are studied explicitly to compensate for the lack of learning of these rules through exposure to, and use of, the language. The wide adoption of interaction and the principles of communicative language teaching and the use of authentic teaching materials are attempts to overcome the limitations of language learning in instructional settings. Central in these endeavors is raising students' awareness that the language they would hear in the real world is different from that used in the classroom. One aspect of this difference is that the fast and fluent speech in a natural setting is connected and reflects assimilatory processes. Comprehending the fast and connected speech used in real-life interactions is challenging for many EFL learners, even those with developed vocabulary, grammar, and reading skills.

Teaching receptive skills

The labeling of both listening and reading as receptive skills finds ground in the fact that they both entail interpreting received messages for meaning. Nonetheless, these two skills are dissimilar in many ways. For one thing, a reader of a written text relies on the orthography and tries to interpret the constituent graphemes, whereas a listener relies on the phonemes in the speaker's utterances. Also, the punctuation in a written text allows for understanding of the encoded message, while a listener needs to pay attention to the supra-segmental features. The different pronunciations due to different varieties of spoken English and the individual characteristics of the speakers ought to be taken into account for successful listening, too. This issue is not confronted in the written form of English due to the standardized English spelling—except for some differences between American and British spelling. More importantly, when reading, the boundaries of words are clear, as the space in between is visible. A listener, in contrast, is not aided by these visual cues. The boundaries between syllables and words often blur, and sounds fuse or disappear.

Listening comprehension involves learners calling upon two types of listening processes. The first category is bottom-up processes. These are the processes the listener uses to assemble the message piece-by-piece from the speech stream, going from the parts to the whole. Bottom-up processing involves “perceiving and parsing the speech stream at increasingly larger levels beginning with auditory-phonetic, phonemic, syllabic, lexical, syntactic, semantic, propositional, pragmatic and interpretive” (Field, 2003, p. 326). The second category of listening comprehension processes is top-down strategies. Top-down processes involve the listener going from the whole—their prior knowledge and their content and rhetorical schemata—to the parts. In other words, “the listener uses what they know of the context of communication to predict what the message will contain and uses parts of the message to confirm, correct, or add to the predictions. The key process here is inferencing” (Nation & Newton, 2009, p. 40). Hence, coupling bottom-up and top-down processes is key to effective listening comprehension.

Scrivener (2005) argues that spoken English comes at the listener too fast for them to be able to adopt an item-by-item (bottom-up) approach on its own and that it seems likely that we make use of bottom-up skills more to fill in missing gaps rather than as a general approach to comprehension word-by-word. Yet, in instances where the listener is not able to draw on the context or the background knowledge of the topic and the text itself is the main source of information, bottom-up processing is central in comprehension. Lynch and Mendelsohn (2002) report on studies that have shown the importance of bottom-up processing in second language listening. The authors suggest targets for listening practice, one of which is coping with and processing fast speech. Indeed, sounds in real-life communication are articulated in a chain, causing linking, and phonemes undergo changes in certain contexts due to constraints. Thereby, EFL learners would be better prepared for communication with fluent speakers if they were accustomed to aspects of connected speech.

Aspects of connected speech

One of the disconnects between the instructional setting and the natural setting of learning English is that EFL learners get used to the slow and careful speech they produce in the classroom and perceive from other learners and even from teachers. This form of speech bears a close resemblance to the spelling representation (Collins et al., 2019). The slow word-by-word dictionary pronunciation of the base forms (abstract forms) is what EFL

learners become accustomed to. Conversely, when English is spoken naturally, the base forms change and are realized differently. The faster the speech, the more sounds change and group themselves together. When learners know about and are familiar with such changes, they begin to hear them and start developing listening fluency (Davis, 1993). Important among the features of connected speech are linking, assimilation, elision, and weak forms.

Linking

Fluent speech is divided into speech units (groups of words uttered in the same tone) rather than into words. Within these speech units, words are linked together, as the ultimate phoneme of a word connects to the first phoneme of the subsequent word. Although when sounds merge some misunderstanding may be resolved by context, the ambiguity of a word sounding like another due to linking can be avoided by raising learners' awareness of this feature of rapid speech units. A word-final sound is linked to the subsequent word-initial sound (e.g., **one evening** → **oneevening** /wʌni:vniŋ/; a **serious accident** → a **seriousaccident** /ə sɪrɪəsæksədənt/; **some milk** → **sommilk** /sʌmmɪlk/; **half full** → **halffull** /hæffʊl/). In some contexts, a word-final sound may be linked to the subsequent word-initial sound through the insertion of the sounds /w/, /j/, or /r/ (e.g., **go away** → **gowaway** /gəʊwəweɪ/; **completely empty** → **completelyyempty** /kəmpli:tlɪjemptɪ/; **pure oxygen** → **pureroxygen** /pʊrɔ:ksɪdʒən/).

Assimilation

In rapid speech, consonant sounds undergo changes in some contexts. Phonemes may change in place of articulation (e.g., **footpath** → **foopath** /fʊppɑ:θ/; **said bye** → **saibbye** /sebbai/; **ten months** → **temmonths** /temmʌnθs/; **kid gloves** → **kiggloves** /kɪgglʌvz/). Phonemes may also change in manner of articulation (e.g., **that side** → **thasside** /ðæssaid/; **good night** → **goonnight** /gʊnnait/; **read this** → **readdis** /ri:ddɪs/). Phonemes may additionally change in voicing to become similar to a neighboring sound for ease of articulation (e.g., **have to** → **hafeto** /hæftə/; **cheesecake** /tʃi:zkeɪk/ → **cheesecake** /tʃi:skeɪk/). This phonological process may occur across morpheme boundaries or across word boundaries. Assimilation can be progressive (a phoneme affects the phoneme that follows it) or regressive (a phoneme affects the phoneme that precedes it). Assimilation may also be coalescent when two adjacent sounds influence each other and a third sound is created as a result. That is, the two sounds coalesce into a sound that shares the phonetic properties of the two original sounds (Alaoui et al., 2019) (e.g., **would you** /wʊd ju:/ → **woudjyou** /wʊdʒu:/; **bless you** /bləs ju:/ → **blechy you** /bleʃu:/).

Elision

In a fast speech unit that reflects elision, the elided sounds have *zero realization*, as they are not pronounced. This process applies to the first phoneme of unvoiced-voiced pairs /t-d/ and /p-b/ (e.g., **sit down** → **sidown** /sɪdaʊn/; **cupboard** → **cuboard** /kʌbɔ:rd/) and to the first of two successive stop sounds (**hot cakes** → **hocakes** /hɒkeɪks/; **good-bye** → **goobye** /gʊbaɪ/). Another example of elision is the *zero realization* of the sounds /s/ and /z/ when these sounds are followed by the sound /ʃ/ (e.g., **nice sheets** → **nisheets** /naɪʃi:ts/; **his shirt** → **hishirt** /hɪʃɜ:rt/). The sounds /t/ and /d/ are equally deleted if they precede /b/ (e.g., **Great Britain** → **Greabritain** /greɪbrɪtən/) or /p/ (**night patrol** → **nighpatrol** /naɪpətrəʊl/; **could pay** → **coupay** /kʊpeɪ/).

Weak Forms

Many function words (pronouns, prepositions, auxiliary verbs, conjunctions, and articles) are accented (pronounced in their strong forms) when pronounced in isolation but are unaccented (pronounced in a weak or reduced form) in rapid speech. In their weak forms, these words reflect reduction of the length of sounds, centralization of vowels towards /ə, ɪ, u/, or the elision of vowels and consonants (Cruttenden, 2014). /ə/ (schwa) is the most common vowel sound in rapid spoken English because this form of speech is laden with reduced forms. In connected speech, /r/ is the reduced form of **are** (e.g., **the plays are poor** → **the plays're poor** /ðə pleɪz r pʊr/), /əv/ is the reduced form of **have** and **of** (e.g., **the boys have arrived** → **the boys've arrived** /ðə bɔɪz əv əraɪvəd/; **some of them** → **some ov them** /sʌm əv ðəm/), and /s/ is the reduced form of **is** and **has** (e.g., **what is this?** → **what's this?** /wʌ:ts ðɪs/; **what has she done?** → **what's she done?** /wʌ:ts ʃi dʌn/). Other instances of weak forms in connected speech are **is** and **has** reduced to /z/ (e.g., **where is she?** → **where's she?** /werz ʃi/;

where **has** she been? → where's she been? /werzʃi bi:n/) and *are* and *or* reduced to /ər/ (e.g., ten **are** under → ten **er** under /ten əɾ ʌndər/; ten **or** under → ten **er** under /ten əɾ ʌndər/). Yet another example of words pronounced in their weak forms in connected speech is *as* and *has* reduced to /əz/ (e.g., how long **has** it been? → how long's it been? /haʊ lɑ:ŋ əz ɪt bi:n/; **as** much **as** he can → **ez** much **ez** he can /əz mʌtʃ əz hi kæn/) and *had* and *would* reduced to /d/ (e.g., she **had** gone → she'd gone /ʃɪd gɑ:n/; she **would** agree → she'd agree /ʃɪd əɡri:/).

LITERATURE REVIEW

Research shows that connected speech features present challenges for learners and negatively impact their communicative competence. Scholarship has also found that there has been a dominance of studies on connected speech exploring production over perception and that connected speech is often overlooked in curriculum and textbooks.

A major challenge for learners of English as an additional language is that they often master isolated word pronunciation but may fail to recognize the same words in connected speech contexts. Vowels are reduced, and words are contracted in fluent speech when non-native listeners expect full, careful articulation. English language learners may, therefore, struggle with connected speech comprehension, even at advanced levels (Jenkins, 2000; Derwing & Munro, 2015). Processing connected speech requires high cognitive effort. The learners inability to decode connected speech results in their working memory becoming overloaded, which triggers anxiety and leads to the inability to retain and process incoming streams of speech (Conti, 2017). Failure to accurately decode connected speech results in communication breakdown.

Connected speech features are a major factor in comprehension difficulties in authentic listening materials (Field, 2003). Research has shown that learners frequently experience *cognitive mishearings* when trying to parse connected speech. This poorly decoded connected speech, faced at the beginning of an utterance, leads to the initiation of inaccurate top-down processing. A chain reaction of syntax and lexical guessing errors follows, compounding comprehension failure across the rest of the utterance. It was, therefore, natural for connected speech to gain interest in listening comprehension and language learning research.

Yet, there appear to have been more studies on connected speech focusing on production (speaking) than studies focusing on perception (listening). This imbalance undermines the importance of understanding how English language learners cognitively decode speech. While learners do not necessarily need to produce complex assimilation to be understood, they must understand these features to comprehend natural native speech (Cauldwell, 2013). Despite the evidence demonstrating the importance of the awareness of connected speech processes, it appears to be sidelined in English language teaching curricula and textbooks. When connected speech is included, it is often treated as a peripheral *pronunciation tip* rather than a core component of listening lessons. Worse, teachers are rarely trained on how to systemically teach the stream of speech during their certification programs (Brown & Crowther, 2022).

A growing body of literature advocates for incorporating connected speech instruction into EFL curricula and training learners to recognize and produce features of connected speech to improve their perceptive decoding skills and expressive oral production (Euler, 2014; Kul, 2016; Momen & Pilus, 2022). Connected speech ought not to be viewed as an advanced or optional feature reserved for near-native speakers. Rather, connected speech awareness-raising is central to rapid native speech decoding (Alameen, 2014). Awareness of these phonological processes affords shifting from rigid word-by-word translation to top-down and bottom-up speech segmentation, ultimately fostering greater proficiency and confidence in real-life communication. It has thus been imperative to investigate whether this awareness can be developed in an instructional setting.

Researchers have explored whether connected speech features instruction improves English as an additional language learners' fluent speech parsing and listening comprehension and connected speech production. Rahimi & Chalak (2017) investigated this effect on Iranian teenagers learning English as a foreign language, Abe (2015) explored the teaching of weak forms and its acquisition in the context of Japan, Ashtiani and Zafarghandi (2015) studied the effect of English verbal songs on connected speech aspects of adult Iranian English learners' speech production, Carreira (2014) investigated the effectiveness of teaching connected speech to Japanese university students, using songs in enhancing their listening fluency, Chao (2019) assessed the efficacy of teaching linking

to EFL learners in the context of Korea, Demirezen (2016) researched the assimilation aspect of Turkish English language teachers pronunciation problems, and Suwartono and Mayaratri (2019) gauged the extent to which the use of songs improves connected speech perception by EFL learners in Thailand. The present study examines the effectiveness of connected speech instruction in the context of Morocco.

THEORETICAL FRAMEWORK

This study is grounded in the theoretical principles of the Speech Learning Model (SLM) (Fledge, 1995), the Perceptual Assimilation for L2 Learners (PAM-L2) (Best & Tyler, 2007), and the Noticing Hypothesis (Schmidt, 1990, 2001). According to SLM, the mechanisms that govern L1 speech acquisition are accessible during L2 learning, and in learning an additional language, L1 and L2 sounds interact and influence one another. SLM also posits that learners initially perceive novel L2 sounds through the filter of existing L1 categories (equivalence classification), which blocks the formation of different phonemic representations. Nonetheless, the automatic equivalence classification can be disrupted through focused perceptual training aiming to sharpen acoustic-phonemic sensitivity by exposing L2 learners to fine-grained phonemic distinctions.

PAM-L2 complements SLM and provides a framework for understanding how listeners map L2 speech segments onto L1 phonological categories based on perceived acoustic similarities. It is held in this model that the degree of perceptual difficulty experienced by L2 learners stems mainly from whether L2 sounds are assimilated as good, poor, or uncategorizable exemplars of L1 sounds. The development plasticity of speech perception advanced in PAM-L2 means that these assimilation patterns can be recalibrated through perceptual training, enabling L2 learners to restructure their perceptual spaces, resolve ambiguities, and develop accurate representations.

Yet, as advanced in the noticing hypothesis framework, crucial for the acquisition of features of L2 speech to occur is conscious attention to a linguistic form or feature. Therefore, the noticing hypothesis is incorporated in the theoretical underpinning of the present study, as, specifically for connected speech features, mere exposure may not lead to acquisition. Connected speech phenomena may remain unnoticed since their occurrences are rapid, automatic, and continuous within fluent speech, making the isolation of their phonological modifications from the surrounding signal challenging. A core notion in the noticing hypothesis is the impossibility for learners to pay attention to all the input to which they are exposed, and that attention facilitates access to awareness and enables noticing. Noticing, in Schmidt's (1994) terms, occurs when the occurrence of a stimulus event is registered in conscious awareness and subsequently stored in long-term memory, and learning a linguistic feature requires focal attention, even if the rule associated with the feature is not understood by the learner (Leow, 2019).

On the basis of the reviewed literature and the theoretical principles adopted, the present study investigates the effectiveness of teaching the connected speech features of linking, assimilation, elision, and weak forms in enhancing speech perception among adults learning English as a foreign language and attempts to answer the following questions:

1. Does teaching features of connected speech have an effect on adult Moroccan intermediate EFL learners' listening comprehension?
2. To what extent does teaching features of connected speech facilitate adult Moroccan intermediate EFL learners' parsing of streams of speech?

METHOD

Participants

The 35 adults (14 male and 21 female, 26 to 42 years old) learning English as a foreign language who voluntarily participated in this study were Moroccan Arabic native speakers and spoke French as a second language. They had pursued their studies in French and had limited exposure to English outside of the classroom. The students had been placed in an intermediate proficiency-level class based on their placement test scores (Oxford Placement Test). These learners were professionals seeking to improve their English proficiency to better

communicate in a globalized workplace and for travel and personal communication purposes. For confidentiality protection, the participants’ names were not used and they were assigned a numeric code (1 through 35).

Procedure

The pretest consisted of a listening comprehension task. The participants listened to an excerpt from a presentation. This spoken text was in an American accent, spoken at a normal speech rate, and contained multiple instances of linking, assimilation, elision, and weak form. Any comprehension-blocking vocabulary had been pre-taught to control the vocabulary comprehension variable. The listening comprehension task consisted of five true/false statements and five multiple-choice questions (one point for each correct answer). The total scores out of ten were converted into out-of-a-hundred scores.

In addition, the participants took a gapped dictation test. The 20 sentences used were taken from *American Accent Training* by Ann Cook and contained words and phrases spoken in connected-speech form that were deleted in the written sentences on the test sheet. The gaps in the sentences corresponded to words and phrases reflecting five instances of each of the connected speech features: linking, assimilation, elision, and weak forms. The participants were instructed to write down the words and phrases in the gaps as they listened. In the scoring scheme adopted, each accurate word or phrase written in the gaps received one point. The total scores out of twenty were converted into out-of-a-hundred scores. The listening comprehension and dictation scores were recorded to later be compared to the posttest scores.

Equivalent listening comprehension and dictation tasks were used in the posttest, with a different spoken text and different dictation sentences. The pretest and posttest versions were equivalent in linguistic difficulty, speech rate, lexical complexity, syntactic complexity, distribution of connected-speech features and question type, and speaker accent.

The six weeks of connected speech instruction (twelve 50-minute sessions) focused on raising the learners’ awareness of linking, assimilation, elision, and weak forms. The instruction also included contrastive analysis and comparison of the careful citation form of words with connected speech forms and exploration of the reasons why these variations occur in rapid speech. The course additionally featured targeted practice in identifying and producing connected speech features, as well as their integration into listening comprehension tasks. The course was adapted from the connected speech instruction framework outlined by John Levis and Kate Challis in *Teaching Pronunciation with Confidence: A Resource for ESL/EFL Teachers and Learners* (Guskaroska et al., 2024).

Statistical analyses were used to determine whether there were any significant differences between listening comprehension and dictation within-group pretest and posttest scores.

RESULTS

The aim in the present study was to evaluate the impact of teaching features of connected speech on listening comprehension and connected speech parsing (speech perception). Descriptive statistics results are shown in Table 6 (listening comprehension pretest and posttest scores) and in Table 7 (dictation pretest and posttest scores). Inferential statistics yielded by the paired samples t-Test are reported in Table 8 (listening comprehension) and in Table 9 (dictation).

As can be seen in Table 6, the participants’ pretest listening comprehension scores reflect a mean score of M = 71.600 (SD = 3.079, SE = 0.521)). The posttest mean score increased to M = 76.514 (SD = 6.012, SE = 1.016).

Table 6. Listening Comprehension Pretest and Posttest Scores Descriptive Statistics

	N	Mean	Std. Error of Mean	Std. Deviation
Pretest score	35	71.600	0.521	3.079
Posttest score	35	76.514	1.016	6.012

Analysis of the dictation pretest scores shown in Table 7 reveals a mean score of $M = 72.971$ ($SD = 2.229$, $SE = 0.377$). The posttest scores reflect a higher mean of $M = 77.400$ ($SD = 4.622$, $SE = 0.781$).

Table 7. Dictation Pretest and Posttest Scores Descriptive Statistics

	N	Mean	Std. Error of Mean	Std. Deviation
Pretest score	35	72.971	0.377	2.229
Posttest score	35	77.400	0.781	4.622

The paired samples t-test results indicate a statistically significant difference between the participants’ pretest and posttest listening comprehension scores [$t(34) = -4.658$, $p < .001$] (Table 8). The mean difference is -4.914 . This significant statistical difference ($p < .001$) and the large effect size [Cohen’s $d = -0.787$ (-1.163 lower, -0.403 upper, 95% confidence interval)] reveal a considerable improvement in listening comprehension performance.

Table 8. Listening Comprehension Scores Paired Samples t-Test

							95% CI for Cohen’s d	
Measure 1	Measure 2	t	df	p	Mean Difference	Cohen’s d	Lower	Upper
Pretest scores	Post-test scores	-4.658	34	< .001	-4.914	-0.787	-1.163	-0.403

A statistically significant difference was also noted between pretest and posttest dictation scores. The paired samples t-Test results in Table 9 indicate a mean score increase [$t(34) = -5.554$, $p < .001$]. The mean difference between the pretest and posttest scores is -4.429 . The p-value ($< .001$) and the large effect size [Cohen’s $d = -0.939$ (-1.333 lower - -0.535 upper, 95% confidence interval)] indicate that the posttest scores were significantly higher than the pretest scores.

Table 9. Dictation Scores Paired Samples t-Test

							95% CI for Cohen’s d	
Measure 1	Measure 2	t	df	p	Mean Difference	Cohen’s d	Lower	Upper
Pretest score	Posttest score	-5.554	34	< .001	-4.429	-0.939	-1.333	-0.535

DISCUSSION

The results of the present study demonstrate statistically significant gains in both listening comprehension (Mean difference = 4.914 ; $p < .001$) and speech perception and parsing (Mean difference = 4.429 ; $p < .001$) following connected speech features instruction. The improvement suggests that instruction in features of connected speech could enhance listening comprehension proficiency. Likewise, the statistically significant difference between the gapped dictation test scores prior to and after instruction in features of connected speech points to an improvement in the participants’ recognition of the citation form of words and phrases pronounced in connected-speech form. This improvement reflects an enhancement of connected speech parsing to a considerable extent. The magnitude of improvement in dictation performance (Cohen’s $d = 0.939$) was more pronounced than that of listening comprehension (Cohen’s $d = 0.787$), suggesting that explicit instruction in connected speech features

may have particularly strong effects on perceptual parsing abilities. These findings accord with the conclusions drawn by scholarship with regard to the positive impact of teaching connected speech on the critical language skill of listening in diverse EFL contexts (Rahimi & Chalak (2017) in Iran; Abe (2015) and Carreira (2014) in Japan; Chao (2019) in Korea; Suwartono & Mayaratri (2019) in Thailand) and expand the insights gained to an additional EFL context.

Explicit instruction in connected speech may enhance EFL learners' ability to map variable acoustic forms onto stored lexical representations by systematically exposing them to the phonological modifications inherent in natural fluent speech, including assimilation, elision, linking, and reduction processes. Training learners to recognize how words and phrases in natural discourse sound different than their isolated, citation form could accelerate lexical access and minimize the ambiguity of phonetic inputs. Improved lexical access reduces the cognitive load associated with bottom-up processing, as learners spend less effort on segmenting the speech stream and identifying individual words. Cognitive resources could, thereby, be freed for higher-level semantic processing and global comprehension. Targeted connected speech instruction could thus create a more efficient processing of incoming speech through automatization of form-to-representation mapping, enabling learners to shift their cognitive effort from the acoustic surface to the construction of meaning. This shift is a central characteristic of proficient L2 listening comprehension and essential for real-time language processing in authentic communicative contexts.

CONCLUSION

Even after periods of English language learning in instructional settings, many EFL learners may not be able to comprehend the connected speech produced by fluent speakers. The lack of consistent exposure to language in a natural setting, as in L1 acquisition, hampers their attainment in developing effective listening skills. The findings of the present study lend support to the argument that integrating teaching features of real-life rapid speech in listening comprehension instruction can alleviate this issue. Paramount in such instruction is raising learners' awareness that the classroom slow, careful, and word-by-word pronunciation is not the only speech form they would encounter in real life. Rather, in everyday fast speech, words are linked together, and sounds change or are, in some contexts, not pronounced. Unawareness of aspects of connected speech hinders developing effective listening skills and, consequently, limits learners' communicative competence.

The findings in this study suggest improvement in speech perception and listening comprehension ability following instruction in features of connected speech. The statistical evidence appears to confirm the effectiveness of this instruction and its pedagogical value. From a pedagogical perspective, the findings of this research may have a number of implications for educational practice. Educators and curriculum designers can draw practical applications of the significant listening proficiency improvement that targeted intervention concerning connected speech can afford. This type of intervention can be gainfully integrated into listening comprehension curricula and syllabi and in teacher pre-service and professional development programs. Incorporating connected speech instruction as a core component in teaching listening would benefit classroom practice and EFL learners' attainment. Still, this research has limitations that are worth noting.

The focus on one proficiency level (intermediate) could be seen as a limitation for this study. However, it allows for pinpointing the effect of the treatment at a specific stage of the English language learning journey. Similar research targeting other proficiency levels would strengthen the generalizability of the findings. Another possible limitation is the age group and background of the participants in this investigation. The focus was on adult learners of English for professional purposes. Similar studies could target young learners of different backgrounds. Moreover, the present study could be complemented by longitudinal research examining the durability of listening skill improvements through teaching connected speech to illuminate whether gains are maintained over time or require continued practice. Another avenue for research would be investigating the effectiveness of different approaches to connected speech instruction.

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