THE ROLE OF LEXICAL STRESS IN ENGLISH AS A LINGUA FRANCA IN SOUTHEAST ASIA

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The role of lexical stress for intelligibility in English as a lingua franca settings (ELF) has been debated. Some scholars argue that lexical stress is unnecessary for international intelligibility, yet others contend that it remains important. Moreover, the discussion of unexpected lexical stress is usually limited to directional shifts, but it should also include other types of innovations. To further investigate the role of lexical stress in ELF interactions, a corpus was collected involving 41 speakers from nine countries in Southeast Asia as they described two sets of discuss-the-difference tasks specifically designed to encourage the production of polysyllabic words. The findings demonstrate that even though innovative word stress was generally intelligible in these interactions, unexpected word stress was still implicated in 24 tokens of misunderstanding. These misunderstandings reveal that deletions of a syllable and shifts in stress with concomitant changes in vowel quality affect intelligibility the most in this ELF context. Intelligible innovations in this corpus demonstrate that equal stress and shifts in lexical stress which do not involve vowel changes rarely hamper intelligibility. Therefore, pronouncing expected syllable patterns and retaining vowel quality while stressing words in ELF interactions in Southeast Asia may enhance intelligibility.

INTRODUCTION

There is consensus that lexical stress, the syllable in a word that is heard more prominently than the others (Roach, 2009), is crucial to intelligibility in English as a Native Language (ENL) speech. ENL speakers use this feature for word recognition, and unexpected changes to this stressed syllable can result in reduced intelligibility (Aitchison, 2012; Brown, 1990; Cutler & Clifton, 1984). On the other hand, in English as a lingua franca (ELF) environments, the role of lexical stress is more contentious. Jenkins (2000, 2015) suggests that lexical stress is less vital to ELF intelligibility and should be excluded from a suggested Lingua Franca Core (LFC) of key features which are more crucial for intelligibility in ELF environments. However, this exclusion of lexical stress as an integral part of ELF intelligibility is questioned by some scholars (Cruttenden, 2014; Dauer, 2005; Jeong, Thoren, & Othman, 2017; Pitzl, 2010; Rajadurai, 2006).

Not all pronunciation features mentioned in the LFC are included in their entirety (Jenkins, 2000). For example, instead of proposing that all consonant clusters be pronounced as expected, there are some innovative exceptions for medial and final clusters. Perhaps there are similar ways of refining core priorities concerning the intelligibility of word stress in ELF settings. Perhaps some innovations to lexical stress are more vital to intelligibility than others.

Though not focused solely on ELF interactions, Field (2005) argues that an unexpected rightward shift in stress may be more problematic than a leftward shift, and Cutler (2015) suggests that shifts involving vowel changes may have a greater impact on unexpected word stress than previously noted. Ghosh and Levis (2021) tested these two theories in an English word stress hierarchy using two to five syllable words with L1 and L2 English listeners and found that indeed lexical stress innovations involving vowel quality changes were the most detrimental to both groups. However, their findings did not include natural speech or ELF contexts.

The definition of what constitutes a lexical stress innovation is also not clearly defined. A shift away from the expected stressed syllable is evidently an innovation. However, Zielinski (2015) argues that segmental changes to words, such as vowel additions or deletions, impact intelligibility on a suprasegmental level as well since a new lexical stress pattern is heard by the change. Therefore, in this paper, syllable additions and deletions are considered a stress innovation. Moreover, words which are not pronounced with any specified prominence (i.e., equal stress or no stress) are also often overlooked from discussions about word stress. A complete picture of lexical stress, not just innovative shifts in stress, needs to be studied in a variety of contexts in order to better understand its role for intelligibility in ELF environments. Thus, as part of a PhD dissertation investigating lexical stress in a corpus of ELF interactions in Southeast Asia (Lewis, forthcoming), this paper examines:

RQ1. How frequently are different types of unexpected lexical stress (mis)understood in these ELF interactions?

RQ2. Which patterns of innovative stress are more consistently involved in misunderstandings in this ELF context and possibly more likely to lead to communication difficulties in a Southeast Asian context?

RQ3. Which patterns of innovative stress may be more intelligible in this ELF context?

METHOD

Discuss-the-Differences Tasks

Since tasks which encourage a true-false response from listeners and which remove the need for background knowledge are reportedly effective for intelligibility research (Kang, Thomson, & Moran, 2018), two discuss-the-differences tasks which elicit the production of polysyllabic words were specifically designed for this study (Lewis, 2019) as shown in Figure 1. Each set of tasks contains one organized picture (left) and one chaotic picture (right), which are connected through a storyline.

When discussed, the objects in the pictures encourage the production of a variety of words such as disyllabic nouns with stress on the first syllable (e.g., *CURtain, SOfa*), disyllabic nouns with stress on the second syllable (e.g., *balLOON, guiTAR*), compound nouns (e.g., *BACKpack, TOOTHbrush*), disyllabic adjectives (e.g., *CIRcled, INjured)*, phrasal verbs (i.e., *fall DOWN, spill OUT*), and the near-minimal pairs of numbers (e.g., *fourTEEN* vs. *FORty, fifTEEN* vs. *FIFty*). Finally, the pictures also contain objects that elicit words with shifting stress depending on their suffixes like *graduATion, phoTOgrapher, elecTRONics,* and *muSIcians.*

Figure 1

Discuss-the-differences sets from Lewis (2019): Living room scenes (upper) and street scenes (lower)
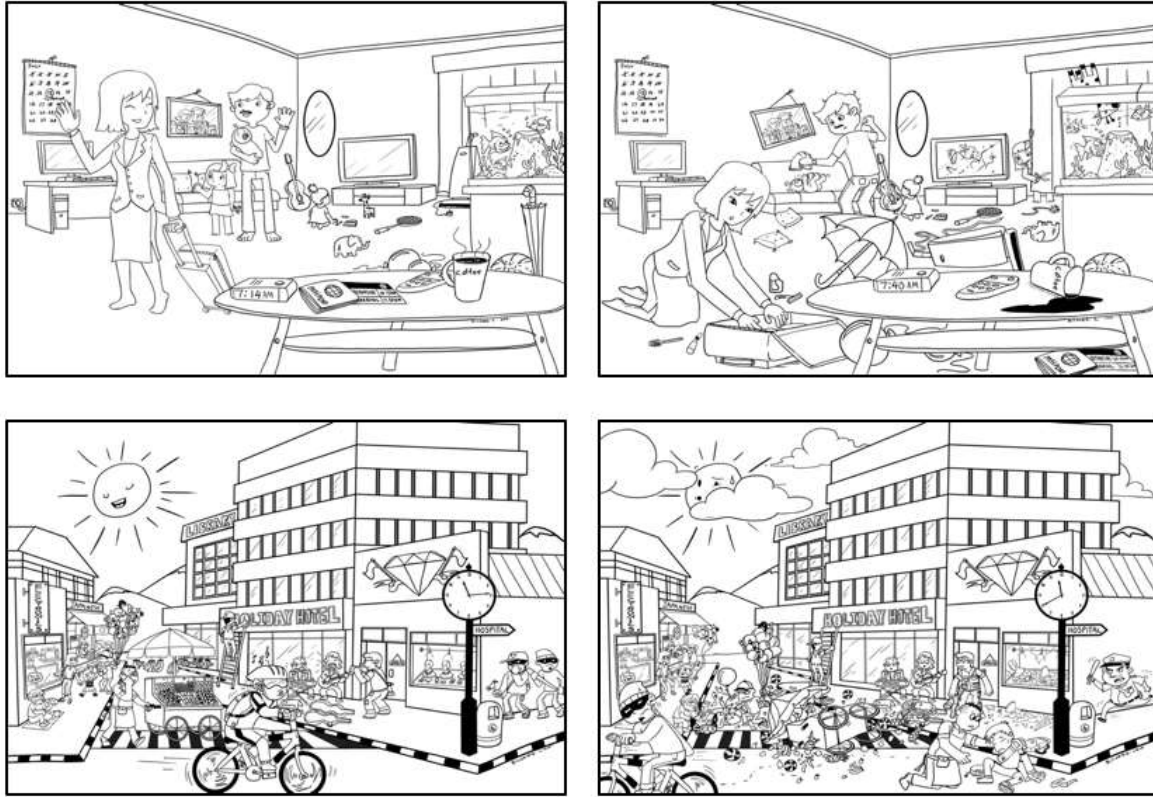
Participants

The participants in this study were 41 young professionals from nine Southeast Asian countries. A breakdown of the number of participants from each country, as well as their first language(s) (L1) backgrounds is provided in Table 1. 83% of the participants were from expanding circle countries (Kachru, 1998) which is significant since speakers from expanding circles are often overlooked as potential judges of intelligibility (Levis, 2005). Participants had a minimum of a 5.5 on the IELTS (or an equivalent test score), and 18 of them were considered advanced speakers.

Table 1

Participants' details

| # Participants	Countries	L1s
8	Laos (La)	Lao
6	Thailand (Th)	Thai, Hmong
6	Vietnam (Vn)	Vietnamese
5	Cambodia (Cb)	Khmer, French
5	Indonesia (In)	Indonesian, Javanese, Padang, Selayar
4	Myanmar (Mm)	Burmese
3	Malaysia (Ma)	Malay, English
2	Brunei (Bn)	Malay, English
2	Philippines (Ph)	Filipino, English, Kapampangan
41		

Recordings

Participants recorded two exchanges with two different partners: once with each set. In each instance, they were partnered with someone from a differing L1 background. While one participant viewed the organized picture, the other viewed the chaotic one. Without seeing each other's pictures, participants discussed how their pictures differed. They were recorded in two 7-minute exchanges, resulting in 40 recordings and 280 minutes of interaction.

Follow-up Surveys

Given that listeners often laugh, remain silent, or change the subject when they do not understand (Deterding, 2013), i.e., they just 'let [misunderstandings] pass' (Firth, 1996), electronic follow-up surveys, similar to cloze activities, were sent through Sogo Survey (2017) to each participant to verify what they heard or said. Figure 2 is an example.

Figure 2

Example of survey questions (Lewis, 2019)
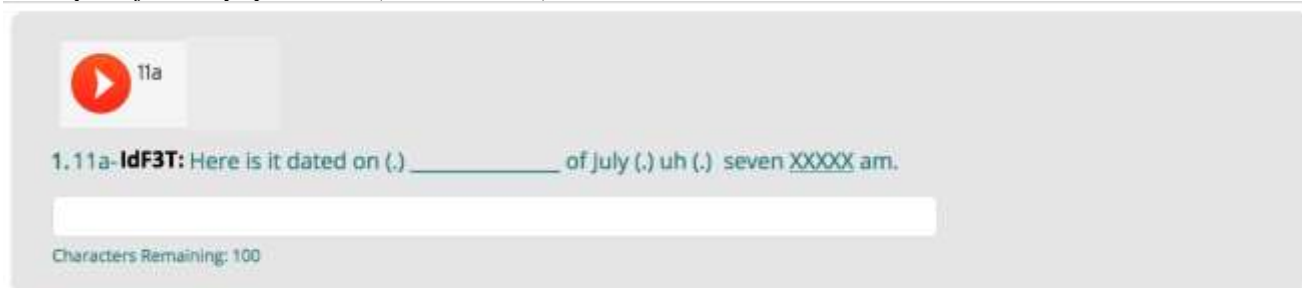
While viewing the same pictures they originally viewed, participants listened to 10-20 audio clips of either their partner or themselves, in which they responded with what think they heard or said. Out of 41 participants, 37 returned the surveys.

Evaluation

Since intelligibility is defined as how well the speaker's intended message is understood (Levis, 2005, 2018; Munro & Derwing, 1995, 2015), the results of the surveys, as well as the conversations themselves, were evaluated for every instance in which the speaker's intention and what the listener heard did not match. There were 158 instances of these tokens of misunderstanding. Then, an attempt was made to identify all potential contributors to the misunderstanding. Pronunciation-based innovations were compared to one of the expected pronunciations found in *Longman's Pronunciation Dictionary* (Wells, 2008).

In tokens with lexical stress innovations, Praat (Boersma & Weenink, 2017) was used to examine pitch, amplitude, vowel lengths, and vowel formants. Formants were compared to each speaker's own speech. When some features of lexical stress (i.e., higher pitch or longer vowel) were on one syllable and other features of word stress were on another syllable in the same word, neither syllable could be determined to be more prominent, and therefore, the misunderstanding was labeled as equal stress. If all vowels were produced quickly, the word was considered as having no stress. As for vowel innovations, /ʌ/ or /ɜ:/ were designated as adequate stressed replacements for /ə/ (Cruttenden, 2014).

Quantitative Exclusions

The nature of discuss-the-difference tasks means that many of the same words are repeated by numerous participants. This has its benefits and challenges. For qualitative purposes, patterns can be observed, but for quantitative purposes, data can be skewed. The near-minimal pairs of -*ty* and -*teen* were implicated in 19 of the 158 tokens of misunderstanding, and when included in many tables and charts, the final percentages are most likely not realistic. Therefore, these tokens are discussed in detail in Lewis (forthcoming), and are included in general totals, but they are excluded in this paper. In addition, the occurrences of the word *photographer* have also been removed quantitatively in some of the following analyses since they were produced innovatively 15 times. However, in this paper they will be discussed qualitatively.

RESULTS

RQ1: Frequency of Misunderstandings Involving Lexical Stress

RQ1 asked how frequently different types of unexpected lexical stress are (mis)understood in these ELF interactions. Out of the 8,500 polysyllabic words produced in this corpus, less than 2% of them were pronounced with unexpected stress; therefore, participants had mostly acquired expected stress as they learned English. Table 2 presents each type of lexical stress innovation ranging from the ones most frequently misunderstood to the least frequently misunderstood and ending with those with insufficient data to draw conclusions.

Table 2

Lexical Stress Innovations

Innovation Type	Syllable Deletions	Shifts in Stress	Equal Stress	Syllable Additions	No Stress
% Mis. (# Mis./Total)	86% (6/7)	15% (13/90)	5% (2/36)	50% (1/2)	100% (2/2)
Definition	An expected vowel is deleted.	Stress is placed on a syllable that is not the expected syllable.	Various lexical stress features are placed on all syllables.	An unexpected vowel is added.	Speech is too fast to identify stress, especially on vowels.
Example	/ˈkæləndər/ → [ˈklendɑː]	/ˈbegə/ → [beˈgɜː]	/ˈpɪloʊ/ → [ˈpɪˈloʊ]	/dʒəˈrɑːf/ → [ziˈrɑfɑ]	[ædəˈlesənt]→ [ædɒlesən]

The '#Mis./ Total' row shows the number of times a type of innovation was implicated in a misunderstanding compared to the total number of time that particular innovation was produced. It is important to note that these innovations often occurred alongside other types of innovations as well. However, in general, 86% of the time a vowel deletion occurred, it was involved in a misunderstanding. Shifts in stress occurred the most frequently, but were only implicated in a misunderstanding 15% of the time they occurred, and equal stress was rarely a hindrance. Finally, there were not enough instances of a vowel addition or of words pronounced with no stress to make reliable conclusions.

RQ2: Misunderstood Innovative Lexical Stress

RQ2 examined patterns of innovative stress which are consistently involved in misunderstandings in this ELF context. As seen in RQ1, almost every deletion of a syllable was involved in a misunderstanding. Table 3 shows the six instances which were misunderstood. These deletions rarely occurred as the sole innovation. Other innovations such as consonant deletions (numbers 1 and 6), a shift in stress (number 2), a change in vowels (number 4 and 6), and/or a consonant changes (numbers 3 and 6) obviously occurred and most likely impacted intelligibility, as well.

Table 3

Instances of Misunderstandings Involving Vowel Deletions

No.	Speaker	Listener	Intended word	Expected	Pronounced	Heard as
1	VnF3	CbM2	alarm clock	/əˈlɑːɹm klɑk/	[ɑːɹm lɒk]	arm lock
2	CbM4	MmF1	alcohol	/ˈælkəhɑːl/	[ælˈkhɑːl]	coffee
3	VnF4	LaM2	balloon	/bəˈluːn/	[bluːm]	?
4	MmM1	MaF2	calendar	/ˈkæləndər/	[ˈklendɑː]	canda
5	MmM1	MaF2	Saying	/ˈseɪɪŋ/	[sɪŋ]	seen
6	ThM1	VnF5	vacuum	/ˈvækjuːm/	[wef]	?

However, the most important column in this table is the 'Heard as' column, which shows what the listener understood. In numbers 1, 2, 4, and 5, the words that the listeners heard consist of the same number of syllables that the speakers pronounced. Thus, it is argued that deletions indeed had some impact on the intelligibility of those tokens.

The thirteen instances of a lexical stress shift that were implicated in misunderstandings were placed into an error gravity hierarchy proposed by Richards (2016) as seen in Table 4. The hierarchy combines both Field's (2005) suggestion that rightward shifts in stress are more problematic than leftward, and Cutler's (2015) proposal that a change in vowels may be the key issue in word stress misunderstandings. The 'Shift' column in Table 4 shows either a leftward shift (L) or a rightward shift (R) in stress as well as the number of vowel changes that occurred in that token. Thus, a leftward shift in stress without any vowel changes (L0) would potentially be the least problematic change in lexical stress and the most problematic would be a rightward shift with three vowel changes (R3). The next columns show how many instances a shift of that particular type were involved in a misunderstanding (# Misunderstood), and the total number of times that type of innovation was understood (# Understood). '% Misunderstood (L/R)' is the percentage of times that type of misunderstanding was not understood. The final column on the right also shows the percent misunderstood, but without the L/R distinction (i.e. only the vowel changes).

Table 4

13 Misunderstandings in an Error Gravity Hierarchy (Richards, 2016)

Degree of Impact	Shift	# Mis-understood	# Under-stood	% Misunder-stood (L/R)	% Misunder-stood
Least Problematic	L0	0	16	0%	5%
	R0	2	25	7%	
	L1	3	10	23%	14%
	R1	2	20	9%	
	L2	3	2	60%	44%
	R2	1	3	25%	
Most Problematic	L3	1	0	100%	100%
	R3	1	0	100%	
Total		**13**	**76**	**15%**	

As seen in Table 4, Field's (2005) suggestion that rightward shifts in stress may be more detrimental to intelligibility than leftward shifts is not supported by this data. The percentages on the L1 and L2 Shift rows were greater than those on the R1 and R2 Shift rows respectively.

The results do support Cutler's (2015) argument that in lexical stress innovations, it is most likely the vowel changes that hinder intelligibility. As the number of vowel changes increased, so did the likelihood of a misunderstanding. With one vowel change, it increased to a 14% chance likely; with two vowel changes, it increased to a 44% chance; and with three vowel changes, there was a 100% chance of the word being misunderstood. These findings are also consistent with Ghosh and Levis's (2021) conclusions. In their research, the further the innovation fell down the hierarchy, the less successfully the word would be understood. Table 5 lists each of the thirteen misunderstandings from Table 4. The 'change' column shows the directional shift of stress as well as the number of vowel changes the speakers produced.

Table 5

Instances of Misunderstood Shifts in Stress

No.	Speaker	Listener	Intended word	Expected	Pronounced	Change	Heard as
7	CbM4	MmF1	beggar	/ˈbegə/	[beˈgɜː]	R0	girl
8	CbM1	LaF2	a racket	/əˈɹækɪt/	[əɹæˈkɪ]	R0	a lot kit
9	VnM1	IdF1	balloon	/bəˈluːn/	[ˈbɑlun]	L1	--
10	ThF2	BnF1	balloon	/bəˈluːn/	[ˈbɑlun]	L1	--
11	PhF1	MmF1	giraffe	/dʒɪˈɹæf/	[ˈdʒiːɹæ]	L1	?
12	CbM3	IdF3	circled	/ˈsɜːkəl/	[sɜːˈkɑːl]	R1	called
13	CbF1	LaM3	umbrella	/ʌmˈbɹelə/	[ʌmbɹeˈlɑː]	R1	?
14	ThM2	BnM1	arranged	/əˈɹeɪndʒ/	[ˈɒːɹəntʃ]	L2	falling
15	LaF2	MaF2	balloon	/bəˈluːn/	[ˈbɔːlɪn]	L2	bowling
16	CbM2	VnF3	umbrella	/ʌmˈbɹelə/	[ˈempɪləɹ]	L2	empiler
17	MmF2	LaM1	brackets	/ˈbɹækɪts/	[bɹeˈkɑːs]	R2	breakout
18	ThM2	BnM1	arrival	/əˈɹaɪvəl/	[ˈɑːluwoʊ]	L3	?
19	CbM1	LaF3	orchestra	/ˈɔːkɪstɹə/	[ɑˈkɑstɹɑː]	R3	a crossta

Numbers 7 and 8, the two examples of a rightward shift with zero vowel changes (R0), both contain stops (/g/ and /k/) in the middle of the word, and the stressed syllable was interpreted as the beginning of a new word. Number 12 was similar. It is possible that rightward shifts with a medial stop may be more problematic, as they may signal word boundaries to listeners. In addition, the expected stress of five out of the 13 misunderstandings in Table 5 are exceptions to common lexical stress rules: the noun *balLOON* (numbers 9, 10, and 15), the noun *giRAFFE* (number 11), and the adjective *arRANGED* (number 14). It may helpful for ELF speakers to be aware of these exceptions. The inclusion of these 'exceptions' may be the reason Field's (2005) rightward shift theory did not work for this data.

Vowel changes, which have already been shown to be problematic, usually occurred when a reduced syllable with /ə/ was given prominence such as in numbers 9, 10, 12, 13, 14, 15, and 18. When speakers did not substitute the reduced /ə/ with /ʌ/ or /ɜː/, the listeners misunderstood the intended vowels, as seen in the 'Heard as' column. Finally, it is also acknowledged that numbers 16 and 18 were pronounced with not only numerous vowel changes, but also consonant changes, which almost certainly impacted intelligibility, as well.

RQ3: Intelligible Innovative Lexical Stress

RQ3 examines which patterns of innovative lexical stress may be more intelligible. As discussed in RQ1, the most intelligible type of lexical innovation was equal stress. As long as speakers stressed the expected syllable, it seemed equally intelligible to stress other syllables as well.

Concerning a shift in stress, out of the 76 instances in which a shift in stress was intelligible, over half of them (54%) retained all the expected vowels. In fact, as long as every vowel in a word was pronounced as expected, most shifts in stress did not seem to impede intelligibility. Words such as *balLOON, guiTAR, prePARing,* and *overLAP* were still understood even when a speaker pronounced them with a leftward shift in stress. Similarly, words such as *CARpenter, COFfee, INjured,* and *TELevision* were understood when there was a rightward shift in stress. Compound nouns were also

understood despite shifts in stress (i.e., *COFfee cup, aLARM clock*). In all these instances, the vowels were produced as expected.

In addition, in words where shifting stress usually occurs because a suffix has been added (e.g., *elecTROnics, muSIcian, phoTOgrapher*), as long as the root of the words were pronounced with the same stressed vowels as they would have been without the suffixes, speakers seemed to have been able to shift stress to any other syllable without a misunderstanding. For instance, even though the word photographer was pronounced as expected only twice out of 17 times in this data, almost every innovation contained /oʊ/ in the first syllable and was understood. Figure 3 shows the number of times the different syllables *photographer* were stressed in this corpus.

Figure 3

Location of lexical stress on 'phoTOgrapher.'

Placement of Lexical Stress on 'photographer'
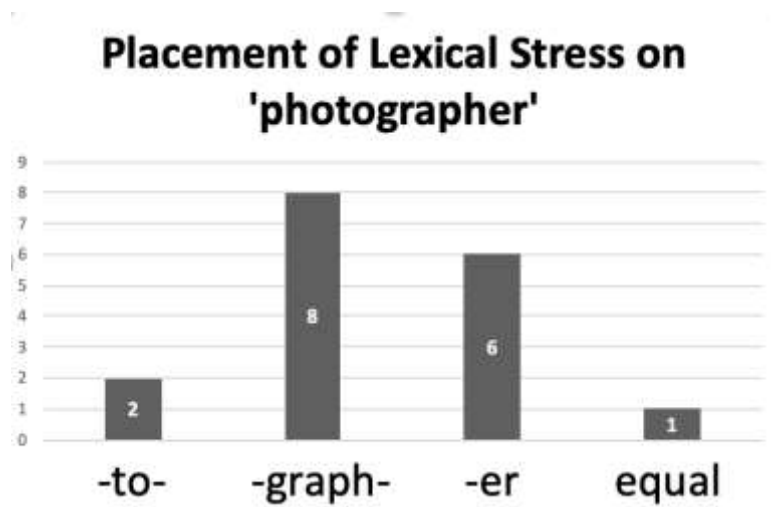
DISCUSSION

The purpose of this study was to observe the role lexical stress has in the intelligibility of English as a Lingua Franca in Southeast Asia. The findings from this study show that the speakers in this ELF context can largely produce lexical stress as expected. When innovations concerning lexical stress do occur, they are generally in the form of syllable deletions, a shift in stress, or equal stress. Equal stress and shifts in stress seem to have little impact on words that are pronounced with their expected vowels. However, if vowels are changed during the shift in stress, intelligibility is affected as Cutler (2015) has suggested and Ghosh and Levis (2021) have found. Interestingly, since intelligibility appears enhanced when vowels do not change, it may be that words with changing stress based on their suffixes may be more intelligible if the vowels on the roots of the words remain the same after a suffix is added. Finally, a deletion of a syllable also hampers intelligibility.

Based on these results, it seems that ELF speakers in Southeast Asia will benefit from practicing many of the skills that are acquired when studying lexical stress. An awareness of syllables might help speakers avoid accidental vowel deletion. A deeper understanding of the reduced vowel, /ə/, may prevent speakers from innovatively shifting their stress to a reduced syllable and changing the expected vowel, or it may aid them in finding a stressed version of a mid-central vowel. If a common

word's pronunciation is an exception to the usual stress rules, it might also be helpful if instructors could mention it.

However, instructors of English in ELF settings may choose not to concentrate on the pronunciation of compound nouns, phrasal verbs, or other words in which the reduced /ə/ is not present. They may also be more tolerant of innovative lexical stress when no vowel changes occur. Moreover, a change in lexical stress based on suffixes might not be as crucial to teach productively, though they should probably still be taught receptively (Lewis & Deterding, 2018).

In conclusion, it seems as though some knowledge of lexical stress could aid in ELF intelligibility in Southeast Asia. However, these results are limited to a particular context and to the vocabulary used in these tasks. There is also a level of subjectivity involved in how much impact each type of innovation truly makes when combined with other innovations. Further research is needed to determine if similar results occur in other ELF settings, with a variety of speakers, and involving additional types of lexical items. Statistical analyses could also be applied to this study and any subsequent studies to verify that lexical stress innovations involving vowel changes and syllable deletions seem to affect ELF intelligibility the most.

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