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A STUDY ON SILENT PAUSES IN ORAL READING: ANALYZING PAUSING PATTERNS AND MOTIVATIONS

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Abstract
Suprasegmental features such as stress, rhythm, intonation, and pausing play a vital role in achieving fluency and comprehensibility in both speech and reading. While elements like stress, intonation, and pitch are well-recognized for their importance, pausing often presents a complex issue. Pauses are integral for intelligibility, allowing listeners to process and understand spoken language effectively. However, pauses are frequently perceived as signs of hesitation and non-fluency, potentially impeding intelligibility and negatively impacting evaluations of speech performance. This paper explores the dual nature of pausing in second language speech, highlighting its crucial role in clarity and understanding while also addressing its potential to be misconstrued as evidence of non-fluency. The study reviews existing literature to provide a nuanced perspective on how pauses affect speech performance and intelligibility.

INTRODUCTION

Background and rationale

Suprasegmentals such as stress, rhythm, intonation, and appropriate pausing are crucial to achieve fluency and comprehensibility (Kuo and Chiang, 2000). Along with stress, intonation, and pitch, pauses are of great significance in speech and reading (Bada, 2006). However, pauses are regarded as hesitation phenomena in oral delivery, and as evidence of nonfluency.

Pausing is critical for intelligibility (Chen, 2006); however, pausing is also considered evidence of nonfluency (Soohwan, 2016), because it is one of the strongest impediments to intelligibility in second language speech, and is associated with negative evaluations of speech performance (Cenoz, 1998).

Pausing phenomena and speech rate may be the primary factors affecting speakers 'fluency, given that perceived improvements in fluency may lead to an increase in speech rate and to a reduction in silent pause time, nonlexical filled pauses, and repetitions (Rossiter, 2009). Tavakoli (2011) found that L2 learners generally pause more often and for longer periods than do native speakers, and Rossiter (2009) reported that pausing accounts for three-quarters of all negative temporal impressions (2009).

Leal (1995) argued that pauses are necessary for the syntactic, semantic, phonetic, and informative understanding of a sentence. A pause is the demarcation of a syntactic structure and can bring new focus on the informative

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level; it may coincide with a tone unit and with punctuation in the text. A pause occurring at different places in a sentence may change its meaning; therefore, it is a crucial device in the organization of the text and is used to organize information during discourse. Three types of discourse are relevant to pausing patterns. The first type is the grammatical categories and types of syntactic organization involved in pause placement. The second type is a pause as a cause of change in meaning and disambiguation. The third type is the location of a pause as a means of emphasis, and as a method of altering pitch patterns.

Bada (2006) posited that during speech and short story reading, learners must keep constituents of meaningful chunks of text together in order to increase comprehension, and to maintain a high level of attention. The use of lexical chunks may facilitate higher fluency in speech production.

Therefore, a reader or speaker must pause when necessary to indicate the beginning or end of a group of words. L2 learners are unable to develop appropriate pausing awareness may exhibit great difficulties during L2 learning, particularly if such learners are not given adequate pedagogical significance during the early stages of L2 learning. Smith et al. (2006) asserted that a small portion of the time required to speak is allocated to pausing. In spontaneous speech, pauses may indicate the time required for language formulation that could not be completed during articulation (Butterworth, 1980). The time allocated to pauses may be mainly responsible for the reduced speaking rate.

Although pausing is critical for intelligibility (Chen, 2006), the literature contains few acoustic studies on the significance of pauses in L2 learners (Chen, 2006). Moreover, although many studies have explored the relationship between pausing, and its effect on listening comprehension, reading comprehension, and oral intelligibility, few studies have focused on the pause patterns of Chinese learners of English as a Foreign Language (EFL) (Kuo and Chiang, 2005). Smith et al. (2006) concluded that more studies are required to investigate reasons such as phonological processing, lexical choice, lexical retrieval, and morphosyntactic formulation that underlie the reduced speaking rate and increased pausing.

This study analyzed the patterns of silent pauses, namely their occurrence, duration, frequency, and distribution, and the reasons for inappropriate pausing patterns in an L2 reading task and addressed the following research questions:

(1) What type of pausing patterns (that is, pause duration, frequency, and distribution) is found in the oral reading task? (2) What are the potential reasons for inappropriate pausing patterns?

LITERATURE REVIEW

Functions of pauses

Pauses—the insertion of silent intervals between linguistic units—can help listeners follow the syntactic organization, and affords time for breathing and speech planning (Chen, 2009).

Leal (1995) defined a pause as a phonetic cue to establish the demarcation of a tone unit. A pause can mark the boundaries of a syntactic unit, and can serve as a sign of the processing of speech in order to conform to an informative pattern. Anderson-Hsieh and Dauer (1997) suggested that pauses occur at sentence boundaries during fast speech, whereas they are inserted within sentences at clause and phrase boundaries during slow speech.

Bada (2006) reported that pausing is a phenomenon that exists in almost all languages. Pauses can be of two types—filled and silent (Bada, 2006), and both are more common at word boundaries than within words. Pauses at grammatical boundaries involve lexical and grammatical terms, and are longer than pauses at word boundaries. Anderson-Hseih and Dauer (1997) suggested that pausing not only reflects the grammatical structure, thus making parsing the speech easier for the listener, but also affords time to the listener to make alternative hypotheses about the meaning of any unclear words.

Pausing and L1/L2 speaking

Pausing patterns have been investigated in the L1 context. Smith et al. (2006) reported that a reduced speaking rate is an early predictor of reading disability, and that it results in differences in the speaking rate, articulation rate, and the proportion of speaking time allocated to pausing in an L1 setting. They suggested that children with reading disability have a reduced speaking rate, and that such children allocate significantly more time to pausing than do children without reading disability.

Many studies have explored the influential role of pauses in L2 speaking. For example, Anderson-Hsieh and Venkatagiri (1994) investigated intermediate proficiency and high-proficiency Chinese ESL speakers‘ syllable duration and pausing patterns, and found differences in syllable duration and pausing between the intermediate-proficiency group and their native-speaking, and high-proficiency counterparts. Intermediate proficiency speakers paused frequently and inappropriately and for longer; moreover, their articulation rate was lower.

Leal (1995) indicated that the duration and number of pauses correlated with an increase in speech rate. Cenoz (1998) investigated silent and filled pauses through speech analyses of intermediate and advanced learners of English. Cenoz (1998) identified the types and functions of pauses, and the relationship between pause occurrence and L2 proficiency, and reported that the distribution of lexical, morphological, and planning pauses differed between silent and filled pauses. Furthermore, more advanced learners used longer and more filled pauses.

Some studies compared the pausing patterns between L1 and L2 contexts. For example, Riazantseva (2001) examined the relationship between L2 proficiency, and pausing patterns in 30 Russian speakers of English performing two oral tasks and suggested that English and Russian monologue speech have different pausing conventions.

Moreover, L2 proficiency was found to influence the pause duration of advanced nonnative speakers. Highly proficient L2 speakers paused more frequently in their L2 tasks than in their L1 tasks. Bada (2006) investigated the pausing patterns preceding, and following ―that‖ clauses in 11 native English speakers and 143 Turkish speakers of English and reported that pauses preceding ―that‖ were much longer than that following ―that‖ in the native speakers‘ oral production, but an opposite trend was observed for pauses among Turkish speakers of English. However, in Rose (2012) review, speech rate was found to potentially reflect learners‘ proficiency levels, with higher proficiency learners producing higher speech rate (Rose, 2012).

To determine the pausing patterns of Chinese EFL learners in Taiwan, Chiang and Kuo (2004) analyzed the pausing patterns in the speech of EFL college students in Taiwan, and suggested that in the oral reading tasks, the pause frequency of higher proficiency students resembled that of native speakers, whereas their pause duration did not. Low-proficiency students paused more often than their intermediate-proficiency counterparts, but the difference was nonsignificant.

Kuo and Chiang (2005) explored the pause patterns of 51 Chinese EFL college students of varying language proficiency levels through two oral tasks, and reported that L2 proficiency may affect the pause duration of more advanced nonnative speakers in the picture description task. In the oral reading task, students with higher oral English proficiency produced pause frequency patterns similar to those of native English speakers.

Moreover, Chen (2006) investigated the difficulties in English speech-timing patterns of Taiwanese learners, and found differences in pause frequency and location, speech rates, and linking and pausing patterns between Taiwanese EFL learners and the native counterparts.

Taiwanese EFL learners exhibited more frequent and inappropriate pausing, slower speech rates, longer consonant–vowel linking duration, and more redundant short pauses and glottal stops between word boundaries

than native speakers. Chen (2007) explored the effects of task structure on the oral performance of Chinese EFL senior high school students, and stated that when performing direction-giving and story-telling tasks, the oral production of Chinese EFL high-proficiency senior high school students strongly resembled that of native speakers, whereas that of their lower-proficiency counterparts did not.

Chen and Kuo (2007) explored the differences, and similarities in the pausing patterns of EFL learners and native speakers, and showed that EFL learners tended to produce more pauses and to pause in extraordinary locations than did English native speakers, and that high proficiency student were more native-like than were their low-proficiency counterparts.

Pause duration, frequency, and distribution are the most frequently researched parameters related to pausing patterns (Chen, 2006; Kuo and Chiang, 2005; Riazantseva, 2001), and the reported pausing patterns vary across oral tasks (Kuo and Chiang, 2005) and across studies. Although earlier studies have indicated that L2 proficiency is a factor affecting pause patterns, only learners with high and intermediate English oral proficiency have been examined in these studies (Kuo and Chiang, 2005), and few studies have examined learners with other oral proficiency levels (Chen, 2009). Such studies are essential to determine L2 learners‘ difficulties and problems in the oral reading task.

Pauses and oral reading fluency

Pauses have been investigated as a measure of oral reading fluency. Jasper and Murray (1931) compared and found differences between the eye movements of normal speakers, and those of stutterers during oral reading. Such differences may be related to neurological and mental diseases. Clemmer et al. (1979) asserted that drama students and church lectors differ in the way they perform oral reading, such as in the pace of articulation, use and duration of silent pauses, and personal reading preferences. Breanitze (1989) examined and determined first graders‘ vocalization time, pause time, pause frequency, and average length of vocalization.

Pauses may also be related to the reading pace, affecting self-paced and fast-paced reading. Miller and Schwanenflugel (2006) examined the degree of prosody in complex sentences, and the role of reading prosody in comprehension and found that children with accurate oral reading had shorter and more adult-like pausing patterns.

Reasons for pauses

Some early studies have explored the reasons for pauses during oral performance. For example, Jasper and Murray (1931) noted that eye movement is related to pausing during oral and silent reading. In Clemmer et al. (1979) review of an earlier study, inappropriate pausing misled the listener, and the speaker because of various associated factors such as those related to grammatical structure, nongrammatical structure, and inadequate language skills. They further indicated that rhetorical pauses served an expressive function similar to that of rhetorical pauses in poetic readings. Pauses were found to be influenced by cognitive needs, physiological needs, and breathing, with each component exerting a differential effect on the length and frequency of pauses (Breanizt (1989). Breanizt (1989) further posited that pauses may be affected by the syntax, and semantic organization of the text. More recently, Miller and Schwaneflugel (2006) reported that during oral reading, students often pause at various locations, such as after commas, and at the end of sentences, because of their cognitive language needs. Similarly, the reasons for pausing have been investigated in the field of speech production. In Cenoz (1998) review of Goldman-Eisler (1968), pauses were found to potentially reflect affective states such as anxiety, and silent pauses corresponded to the cognitive difficulty of the task involved. Cenoz (1998) further stated that pauses may have three functions: a physiological function, allowing the speaker to breathe; a cognitive function, allowing the speaker to plan his or her speech; and a communicative function, which helps the listener to identify demarcations

in the speech stream. The occurrence of pauses may be associated with the difficulty of the task or the nature of the subject matter and pauses may be symptoms of difficulties encountered in processing and planning (Cenoz, 1998). Furthermore, Gabriela and James (1991) noted that students think and form a sentence before speaking; therefore, they frequently pause during oral production. In addition, students pause because of factors such as personal speaking style and loss of attention.

From the perspective of interpretation, in Chen (2009) review of an earlier study on the reasons for pauses in the context of sight translation, pauses were found to have the functions of articulation, breathing, speech planning, and rhetoric effect. Chen (2009) further explored the reasons for certain pauses occurring during interpretation and classified them into five categories: formulation, eye movement, monitoring or correction, no reason, and others. In order to explore the occurrence of silent pauses and the reasons for inappropriate pausing patterns in L2 reading tasks, the preceding was discussed in the following sections.

METHODOLOGY

Participants

The study participants were selected from one intact class comprised of 44 students aged 20 to 22 years in a technical university in Central Taiwan. The participants were senior students majoring in Applied Foreign Languages, and were required to attend a Speech and Communication course for 2 hours each week for 1 year in order to enhance their oral skills. All participants learned English for at least 7 years.

Two participants were absent during the data collection procedure. The English oral proficiency levels of the remaining 42 participants were determined by administering a picture description test drawn from the oral section of the General English Proficiency Test (GEPT)—Intermediate Level. The participants were scored by two native English speakers according to the GEPT criteria and were classified into three proficiency levels: top 30%, middle 40%, and bottom 30%.

Subsequently, the top 30% and bottom 30% were administered an oral reading task; the top 30% (14 participants) scored 85–75 points and are herein referred to as high-oral-proficiency learners, whereas the bottom 30% (13 participants) scored 50 to 69.5 points, and are herein referred to as intermediate-oral-proficiency learners. An independent sample t-test showed a significant difference in the oral performance of the high- and intermediate-proficiency groups ($t = 9.404$, $p < 0.001$), confirming that the oral proficiency levels of these two groups were heterogeneous.

Speech samples of three native English speakers (two Americans and one Canadian; one woman and two men) served as the baseline for comparison. The average age of the baseline speakers was 37 years, and all of them had approximately 15 years of English teaching experience in Taiwan.

Instruments

Two subtests of the GEPT (Intermediate Level) speaking test were used as the main instrument: based on a picture description task, which was used to determine the participants‘ oral proficiency levels, and an oral reading task involving a 75-word passage of four long sentences with 28, 20, 31, and 21 syllables, which was used to examine the participants‘ pause patterns. The test content was about online communication, which is a familiar topic, and had an appropriate level of difficulty for both groups. A semi structured interview was used to explore the reasons for inappropriate pausing patterns. After the oral reading task, both the high- and intermediate-proficiency participants were interviewed and asked to retrospect on the inappropriate pausing patterns. This semi structured interview was conducted to obtain in-depth information on the potential reasons for inappropriate pausing patterns.

Procedures

All participants were first administered a picture description task, wherein they were asked to describe the picture with the help of four guided questions:

(1) Where was the picture taken?
(2) What are the people doing?
(3) What is the woman talking about?
(4) Describe the picture in detail.

The participants were given 30 seconds to prepare, following which they were asked to speak for 1.5 min. All responses were recorded using a digital recorder. Two native English speakers scored the participants' oral performance, on the basis of which the participants were classified as high- and intermediate-oral-proficiency participants. The interrater reliability (Cronbach alpha) of the oral test was 0.818.

Before the oral reading test was administered to the participants, the three native English speakers read the content aloud, which served as the baseline for the pausing patterns. In the oral reading task, the high- and intermediate-proficiency participants were given 1 minute to prepare for the task and 2 minutes to read the sentence out loud. After this task, participants from both groups were interviewed to investigate the reasons for inappropriate pausing patterns.

Data analysis

The GoldWave computer program was used to analyze, synthesize, and manipulate speech, and to create high-quality pictures for the picture description task.

This program supports spectral analysis, pitch analysis, formant analysis, intensity analysis, annotation, and manipulation of pitch, duration, intensity, and formants (Chen, 2006). Because 71.5% of all pauses are between 250 milliseconds and 1 second (Kuo and Chiang, 2005), pauses shorter than 0.25 seconds were ignored. Thus, the cut-off value for a pause was set at 0.25 seconds in this study, as suggested in the literature (Kuo & Chiang, 2005).

After the data were processed using the GoldWave program, the total number of pauses, total speaking time, total pausing time, total articulation time, beginning and ending time of the pauses, and pause durations were recorded. The duration, frequency, and distribution of all silent pauses, including the average number of pauses, average number of pauses per 100 syllables, average pause duration, average pausing ratio, and articulation rate, were analyzed. The number of pauses is hereafter referred to as pause number.

The independent sample t-test was used to investigate the differences in the pausing patterns of the baseline (native speakers) group and the Chinese EFL group, whereas one-way analysis of variance (ANOVA) was utilized to analyze the differences in the pausing patterns of the baseline group, the Chinese EFL high proficiency group, and the Chinese EFL intermediate-proficiency group.

For qualitative data analysis, the reasons for inappropriate pausing were acquired from the interview results and were categorized according the coding categories proposed in earlier studies (Mead, 2000, 2005; Chen, 2009). The reasons for the pauses produced by the groups were further categorized into subcategories.

RESULTS AND DISCUSSION

The measured pausing patterns were analyzed in terms of pause duration, pause frequency, and pause distribution. Two main analyses were performed to address the two research questions of this study. The first analysis explored the overall pausing patterns of Chinese EFL learners and native English speakers and identified differences among the native English speakers, high-proficiency Chinese EFL learners, and intermediate proficiency Chinese EFL

learners. The second analysis focused on the reasons for the inappropriate pausing in both the high-proficiency and intermediate proficiency groups.

Table 1 summarizes the results of a preliminary analysis of the mean pause rates for native English speakers and Chinese EFL learners. The mean pause numbers of Chinese EFL learners (12.63, SD = 3.22) were higher than those of the native speakers (8.33, SD
= .94). The native-speaker group and the EFL group paused for 20.60 and 19.60% of the total speech time, respectively.

The average pausing time in the native-speaker group was 0.70 (SD = .30) seconds, whereas the corresponding value was 0.55 (SD = .97) seconds in the Chinese EFL group. The mean articulation rate of the native speakers was 5.08 syllables per second (s.p.s), which is within the 4.4 to 5.9 s.p.s. range expected for native speakers (Chiang and Kuo, 2004).

The mean articulate rate of the EFL group was 4.16 (SD = .44). The Chinese EFL learners appeared to pause more frequently, and had a slower articulation rate; however, the EFL learners had a low pause ratio and less pausing time than did their native counterparts. These findings are consistent with those of Anderson-Hsieh and Venkatagiri (1994) and Chiang and Kuo (2004) and indicate that although EFL learners pause more frequently than do their native counterparts during an oral reading task, native English speakers pause for longer and have a higher pause ratio than do EFL learners. As indicated by Chiang and Kuo (2004), an oral test administered under test conditions may affect EFL learners‘ pause time; furthermore, native English speakers who are experienced English teachers may produce longer pauses than are typical for non-teachers.

In the present study, because the oral reading task was conducted under test conditions, wherein the participants had limited time to complete the task, the participants may have read aloud and as fast as possible for the task. The longer pauses of the three native English speakers in this study may be because they were experienced English teachers and two taught in junior high schools. In other words, their longer pauses may be influenced by their teaching experience; because they teach in junior high schools, they may need to produce longer pauses in order to provide their students with more time to process the information during teaching (Table 1).

The mean pause rates of the native English speakers, the high-proficiency group (hereafter referred to as the IP group), and the intermediate-proficiency group (hereafter referred to as the HP group) were further analyzed (Table 2). Both the HP and IP groups produced similar pause numbers (12.07±2.84 and 13.46±3.26, respectively). The HP and IP groups paused for 20.08 and 19.96% of the total speaking time, respectively, and had a similar average pausing time of 0.56±0.12 and 0.55±0.08, respectively.

The HP group articulated 4.26 s.p.s, and the IP group articulated 4.06 s.p.s. These findings indicated that HP and IP groups exhibited nearly the same pause number but that the IP group paused slightly more frequently than did the HP group, a finding consistent with those of Anderson-Hsieh and Venkatagiri (1994) and Chiang and Kuo (2004). Moreover, the HP group articulated faster than did the IP group.

The HP group produced slightly longer pauses and produced a slightly higher pause ratio than did the IP group, which contradicts the finding of Chiang and Kuo (2004). One possible reason is that as less experienced learners, IP participants may be more nervous under the test conditions than are their more experienced counterparts. Thus, the IP group may attempt to complete the task without much pausing time.

Another finding was that although the HP group had higher pausing time and pausing ratio, the articulation rate of the HP group was higher than that of the IP group; this result conforms to that of Anderson-Hsieh and Venkatagiri (1994), and indicates that the articulation rates of high-proficiency students may be similar to that of

native speakers. In the present study, the IP participants attempted their best to pause for a short time, which tended to increase the pause number during the task.

Table 1. Mean number of pauses in the native-speaker and EFL groups.

Language group variables	**Native speakers (N=3)**	**Chinese EFL learners (N=27)**
Average pause number (frequency)	8.33 (SD=.94)	12.63 (SD=3.22)
Average pause number per 100 syllables (frequency)	7.44 (SD=1.36)	11.33 (SD=2.78)
Average pausing ratio	20.60	19.60
Average pausing time (duration)	0.70 (SD=.30)	0.55 (SD=.97)
Articulation rate (syllables/second)	5.08 (SD=0.47)	4.16 (SD=.44)

Table 2. Mean number of pauses in the native-speaker, HP, and IP groups.

Language group Variables	**Native speakers (N=3)**	**Chinese EFL learners (H) (N=14)**	**Chinese EFL learners (L) (N=13)**
Average pause number (frequency)	8.33 (SD=.94)	12.07 (SD=2.84)	13.46 (SD=3.26)
Average pause number per 100 syllables (frequency)	7.44 (SD=1.36)	10.78 (SD=2.54)	11.93 (SD=3.01)
Average pausing ratio	20.60	19.96	19.23
Average pausing time (duration)	0.70 (SD=.30)	0.56 (SD=.12)	0.55 (SD=0.08)
Articulation rate (syllables/second)	5.08 (SD=0.47)	4.26 (SD=.44)	4.06 (SD=0.44)

Pause duration

Table 3 presents the pause duration of the native English speakers, and the Chinese EFL learners. The pause duration produced by the Chinese EFL learners in the oral reading task did not differ significantly from that of native speakers ($t = -1.124$, $p > 0.05$). This finding corroborates with Chiang and Kuo (2004) assertion that in an oral reading task, Chinese learners can speak as fluently as native speakers in terms of pause duration.

Table 4 shows the pause duration patterns of the native-speaker group and the Chinese EFL learners with varying proficiency levels. The native English speakers had longer pauses than did both HP EFL learners, and their IP counterparts, a result inconsistent with the findings of Anderson-Hsieh and Venkatagiri (1994), who reported that pause durations of native English speakers are shorter than those of IP speakers. As explained earlier, the longer pause duration of the native speakers may be because of their teaching background.

In addition, both HP and IP EFL learners exhibited nearly the same pause duration during the oral reading task, which is consistent with the finding of Chiang and Kuo (2004), who stated that ―in oral reading task Chinese EFL subjects of different proficiency levels were equally fluent in producing similar pause duration pattern‖.

The one-way ANOVA results (Table 5) revealed that the difference in pause duration among native English speakers, Chinese HP learners, and Chinese IP learners was statistically nonsignificant ($F = 2.541$, $p > 0.05$). In other words, all three groups produced very similar pause durations during the oral reading task, which finding is identical to Chiang and Kuo (2004) finding.

Table 3. Pause duration (seconds) of native speakers and Chinese EFL groups in the oral reading task.

Language group	N	Mean	SD	t
Native speakers	3	0.55	0.10	-1.124
Chinese EFL learners	27	0.70	0.21	n.s.

Table 4. Pause duration (seconds) of native speakers and Chinese EFL groups with varying oral English proficiency levels in the oral reading task.

Language group	N	Mean	SD
Native speakers	3	0.70	0.21
Chinese EFL learners-HP	14	0.56	0.12
Chinese EFL learners-IP	13	0.55	0.08

Table 5. ANOVA results for pause duration (seconds).

Variable		SS	df	MS	F
Pause Duration	Between-group	0.598	2	0.0299	2.451n.s.
	Within-group	0.330	27	0.0122	

Pause frequency

Pause frequency was compared between the native English speakers and Chinese EFL learners, and between native English speakers and EFL learners with varying proficiency levels (Table 6). Chinese EFL learners produced significantly more pauses per 100 syllables than did native English speakers ($t = -2.363$, $p < 0.05$).

In other words, native English speakers produced significantly fewer pauses in the oral reading task than did Chinese EFL learners, which is consistent with the findings of earlier studies (Anderson-Hsieh and Venkatagiri, 1994; Chiang and Kuo, 2004) (Table 6).

The pause frequency produced by the native English speakers was compared with those of Chinese EFL learners with varying oral proficiency levels (Table 7). The native English speakers had fewer pauses per 100 syllables than did the EFL HP and IP groups.

Specifically, HP learners produced more pauses than did the native speakers, whereas IP learners produced more pauses than both HP learners and native speakers. This result is attributable to the incomplete language development among learners, as Munro and Derwing (2001) stated, L2 learners speak more slowly than native speakers do due to the production problems associated with undeveloped syntactic and morphological knowledge to slower lexical recognition (Table 7): n.s. $p > 0.05$.

Table 6. Pause frequency (pauses per 100 syllables) of native speakers and Chinese EFL groups in the oral reading task.

Language group	N	Mean	SD	t
Native speakers	3	7.44	1.36	-
Chinese EFL learners	27	11.33	2.78	2.363*

*$p < 0.05$.

Table 7. Pause frequency (pauses per 100 syllables) of native speakers and Chinese EFL groups with varying oral English proficiency levels in the oral reading task.

Language group	N	Mean	SD

Native speakers	3	7.44	1.36
Chinese EFL learners-HP	14	10.78	2.54
Chinese EFL learners-IP	13	11.93	3.01

―L2 users speak more slowly than native speakers do for the reasons that may range from production problems due to incompletely developed syntactic and morphological knowledge to slower lexical access‖ (p. 33).

One-way ANOVA revealed a statistically significant difference among the three groups ($F = 2.425$, $p < .05$; Table 8). Scheffe multiple comparisons showed that the pause frequency of the Chinese IP learners was significantly higher than that of the native English speakers, whereas that of the Chinese HP learners did not differ significantly from that of the native English speakers. The latter result contradicts the findings of Chen (2007), Chiang and Kuo (2004) and Chen and Kuo (2007), who reported that the IP group produces significantly more pauses in the picture description, direction-giving, and story-telling tasks than does the HP group. Furthermore, the pause frequency of the two Chinese EFL subgroups was similar. These results are consistent with those of Chiang and Kuo (2004). Apparently, as the difficulty of the speaking tasks increases, pause frequency tends to serve as a function of language proficiency (Table 8).

Table 8. ANOVA results for pause frequency.

Variable	SS	df	MS	F	Post hoc comparison
Pause duration Between-group	49.724	2	24.862	3.425*	C>A
within-group	196.009	27	7.260		

*$p < 0.05$ A: native-speaker group, B: high-proficiency group, C: low-proficiency group.

Table 9. Pause distribution (pauses within constituents per 100 syllables) produced by native speakers and Chinese EFL groups in the oral reading task.

Language group	N	Mean	SD	t
Native speakers	3	2.08	0.51	
2.48* Chinese EFL learners	27	6.02	2.70	

*$p < 0.05$.

Table 10. Pause distribution (pauses within constituents per 100 syllables) produced by native speakers and Chinese EFL groups with varying oral English proficiency levels in the oral reading task.

Language group	N	Mean	SD
Native speakers	3	2.08	0.51
Chinese EFL learners-HP	14	5.61	2.33
Chinese EFL learners-IP	13	6.46	3.08

Pause distribution

Table 9 presents the means and standard deviations of the pause distribution produced by native English speakers, and Chinese EFL learners. The t-test results showed that the pause distribution produced by Chinese EFL learners in the oral reading task differed significantly from that produced by native English speakers ($t = 2.48$, $p < 0.05$), which implies that Chinese EFL learners tend to pause within constituents more than do native English speakers (Anderson-Hsieh and Venkatagiri, 1994; Chiang and Kuo, 2004) (Table 9).

Furthermore, the pause distribution produced by native

English speakers was compared with those of Chinese EFL learners with varying oral proficiency levels (Table 10). The native English speakers exhibited fewer pauses within constituents per 100 syllables (2.08± 0.51) than did the EFL HP (5.61±2.33) and IP (6.46±3.08) groups. HP learners produced more inappropriate pauses than did the native speakers, whereas IP learners produced more inappropriate pauses that did the other two groups. Inappropriate pausing may be explained by the difficulties IP learners face with syntactic and morphological knowledge (Munro and Derwing, 2001) (Table 10).

Table 11 presents the one-way ANOVA results for pauses within constituents. A significant difference was observed among native English speakers, Chinese HP learners, and Chinese IP learners ($F = 3.402$, $p < .05$), suggesting that some between-group comparisons differed significantly. Scheffe multiple comparisons showed that pauses within constituents produced by the Chinese IP learners was significantly higher than those produced by the native English speakers, but the corresponding difference between Chinese HP learners and the native speakers was nonsignificant.

Furthermore, the pause distribution of two Chinese EFL subgroups was similar. These findings are consistent with those of Chiang and Kuo (2004), who reported that the pause distribution patterns of the native-speaker group and HP group are similar whereas those of the native- words, Chinese IP learners tend to produce pauses at extraordinary positions (Chen and Kuo, 2007) (Table 11).

Table 11. ANOVA results for pause distribution within constituents per 100 syllables measured.

Variable		SS	df	MS	F	Post hoc comparison
Pause distribution	Between-group	46.597	2	23.299	3.402*	C>A
	within-group	184.937	27	6.850		

*p < .05 A: native-speaker group, B: high-proficiency group, C: low-proficiency group.

Reasons for pauses within constituents

For a comprehensive understanding of the Chinese EFL learners' cognitive processes leading to the pausing patterns in the oral reading task, retrospective interviews were conducted for all participants in the HP and IP groups. The identified reasons for Chinese EFL learners' pause within constituents were categorized according to the coding scheme proposed in earlier studies (Breanizt, 1989; Cenoz, 1998; Chen, 2009; Clemmer et al., 1979; Gabriela and James, 1991; Jasper and Murray, 1931; Miller and Schwaneflugel, 2006), as follows:

(1) Difficulties in grammar
(2) Difficulties in vocabulary
(3) Long sentences requiring a pause for breath
(4) Eye movement (hesitation to read ahead)
(5) Breaking off the line feed (pauses caused by reading the last word of a line) (6) Anxiety
(7) Carelessness, and (8) Providing emphasis.

The following excerpts exemplify the reasons reported by the participants. The first excerpt indicates that the participants produced inappropriate pauses because of grammatical problems.

Excerpt 1: Why shop for a card——I was not sure about
the sentence structure. I didn't
know I should pause here.‖

The second excerpt reveals that the participants paused inappropriately because of vocabulary difficulties.

Excerpt 2: congratulations——This word was difficult to

pronounce. I have rarely used the word _conveniently‘.‖

The third excerpt indicates that the participants needed to pause when reading long sentences.

Excerpt 3: you can‘t help——This sentence was too long and I was worried that I didn‘t have enough breath to finish the sentence.‖

The fourth excerpt clarifies that the participants‘ hesitation to read ahead.

Excerpt 4: your——I paused to think about how to pronounce the following sentence because it was difficult.‖

The fifth excerpt indicates that the participants paused after reading the last word of a line.

Excerpt 5: e-mail——I paused here because it was the end of the sentence and I had to prepare to read the following sentence.‖

The sixth excerpt indicates that the participants were anxious and thus occasionally paused.

Excerpt 6: people——I was too nervous and I was worried about making mistakes.‖

The seventh excerpt clarifies that the participants paused because of their carelessness.

Excerpt 7: personal——I paused because I was careles?.‖

The eighth excerpt clarifies that the participants paused to emphasize certain words.

Excerpt 8: appreciate——I want to emphasize _the effort‘.‖

Table 12. Reasons for inappropriate pausing by the high- and low-proficiency groups.

Reasons	Chinese EFL learners-HP			Chinese EFL learners-IP		
	Occurrence	Percentage (%)	Rank	Occurrence	Percentage (%)	Rank
Difficulties in grammar	12	20	2	18	25.71	1
Difficulties in reading vocabulary	2	3.33	6	8	11.43	4
Long sentences without enough breath	24	40	1	9	12.86	3
Eye movement	7	11.67	4	15	21.43	2
Breaking off for the line feed	0	0	7	6	8.56	5
Anxiety	8	13.33	3	6	8.56	5
Making emphasis	7	11.67	4	6	8.56	5
Carelessness	0	0	7	2	2.89	8
Total	60	100	-	70	100	-

Table 12 presents a comparison of the reasons for inappropriate pausing produced by the HP and IP groups. Most pauses by IP learners were attributed to linguistic difficulties in such elements as grammar (18 of 70), followed by difficulties in eye movement (15 of 70), physiological breathing problems (9 of 70), difficulties in vocabulary (8 of 70), breaking off for line feed (6 of 70), anxiety (6 of 70), providing emphasis (6 of 70), and carelessness (2 of 70). By contrast, in the HP group, the main reasons for inappropriate pausing were physiological breathing problems (24 of 60), grammatical problems (12 of 60), anxiety (8 of 60), providing emphasis (7 of 60), difficulties in eye movement (7 of 60), and vocabulary deficiency (2 of 60) (Table 12).

HP learners tended to pause inappropriately mainly due to the physiological factor of breathing problems (40%). These findings corroborate with Cenoz (1998) assertion that pauses serve a physiological function, and allow the

speaker to breathe. As HP learners read long sentences, they may pause for breath, but such pausing may not always be produced at the right position, as stated by one of the interviewees:

―This sentence was too long and I didn‘t have enough breath to finish the sentence‖

By contrast, IP learners paused because of a lack of linguistic knowledge. This finding is consistent with Cenoz (1998) assertion that pauses are symptoms of difficulties encountered in processing.

Furthermore, difficulties in eye movement (21.43%) were another main factor affecting IP learners‘ pausing patterns. Such difficulties may result from the learners‘ silent-reading problems, which may be influenced by their lack of vocabulary or linguistic knowledge. This deficiency might also affect their affective domain, making them anxious (8.56%) during the oral reading task. Thus, the reasons reported by the IP learners may be related to one another to some extent.

Table 13 presents the factors distinguishing HP learners from IP learners. The IP group reported grammar problem ($t = -15.204$, $p < 0.001$), vocabulary deficiency ($t = -15.204$, $p < 0.001$), eye movement ($t = -20.207$, $p < 0.001$), breaking off for line feed ($t = -21.944$, $p < 0.001$), and carelessness ($t = -7.500$, $p < .001$) at a significantly higher frequency than did the HP group. Some of these reasons are consistent with those reported by earlier studies. As noted by Jasper and Murray (1931), eye movement may be related to pausing during oral and silent reading. Furthermore, being careless while pausing may corroborate with the statement that participants frequently pause during oral production because of loss of attention (Gabriela and James, 1991).

The HP group reported psychological breathing problems ($t = 37.335$, $p < 0.001$), anxiety ($t = 4.811$, $p < 0.001$), and providing emphasis ($t = 2.309$, $p < 0.05$) at a significantly higher frequency that did the IP group. As indicated by Breanizt (1989), a fluent reader makes breathing pauses primarily depending on the organization of the content. The finding that pauses were made for providing emphasis supports the assertion stated by Clemmer et al. (1979) assertion that advanced drama participants tend to make rhetorical pauses, which serve an expressive function similar to that of rhetorical pauses in poetic readings (Table 13).

Table 13. Reasons for pausing by the HP and IP groups.

Category	HP (%)	IP (%)	t	p
Difficulties in grammar	12 (20)	18 (25.71)	-15.204	0.000***
Difficulties in vocabulary	2 (3.33)	8 (11.43)	-15.204	0.000***
Long sentences without enough breath	24 (40)	9 (12.86)	37.335	0.000***
Eye movement	7 (11.67)	15 (21.43)	-20.207	0.000***
Breaking off for the line feed	0 (0)	6 (8.56)	-21.944	0.000***
Anxiety	8 (13.33)	6 (8.56)	4.811	0.000***
Making emphasis	7 (11.67)	6 (8.56)	2.309	0.030*
Carelessness	0 (0)	2 (2.89)	-7.500	0.000***

***$p < 0.001$ * $p < 0.05$.

CONCLUSION

The present study analyzed pause duration, pause frequency, and pause distribution and the reasons for inappropriate pausing patterns in an L2 reading task, and found that Chinese EFL learners tend to produce longer pauses at higher frequencies and more inappropriate pauses than native English speakers do. However, significant differences were observed only in pause frequency, and pause distribution patterns between the EFL and native-speaker groups.

Additional studies can therefore explore the relationship between pause duration and proficiency levels, and the reasons why pausing fails to serve functions of oral language proficiency. Furthermore, although significant differences were observed in pause frequency and pause distribution between the native and Chinese EFL groups, the differences were apparent only between the native speakers, and the IP learners. Because HP and IP learners did not show obvious differences in pause frequency and distribution during the oral reading task, additional studies that include different speaking tasks and involve subjects with various backgrounds can be conducted to obtain possible explanations.

Finally, this study employed a small sample. Future research can involve more participants to obtain a comprehensive understanding of pausing patterns in the L2 learning environment.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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