



What Can We Tell from These Temporal Measures? – Temporal Measures as Indices of Oral Proficiency

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Abstract

Oral English teaching has long been a weak link in the science universities in China, let alone the research on oral English test by quantitative method. Therefore, OEPT in the U.S. sheds enlightening light on the spoken English teaching and researching in China. OEPT (Oral English Proficiency Test) is a spoken English test aimed to assess the oral English proficiency of prospective international teaching assistants in the U.S. In the past few years, temporal variables as indices of oral English proficiency to analyze examinees' oral speech were explored and studied at a large Mid-western American university. Based on the descriptive statistics of the selected temporal variables, this paper aims to give an interpretation of the figures obtained by OEPT data in order to get enlightening implications on spoken English teaching in China.

Keywords: OEPT, Silent pause time, Filled pause time, Speech time, MSR (Mean Syllables per Run), Speech rate, Articulation rate

1. OEPT Data

OEPT (Oral English Proficiency Test) is a spoken English test aimed to assess the oral English proficiency of prospective international teaching assistants at a large research-based North American university. The OEPT is a semi-direct test which is conducted on computer. The students' oral performance sound files are stored onto disks and rated by human raters. The test includes ten items: compare and contrast, summarize graph, newspaper headline, pass on information, read aloud, give advice, personal history, telephone message, summarize conversation 1 and 2. Each examinee is rated by two raters on a five-point ordinal scale (2 - 6). Examinees pass the test with a score of 5 or above. Those students who are below 5 are required to take a one-semester English course – English001T. The test has eight forms, across which the difficulty of the corresponding items is equivalent. The computer randomly assigns one out of the eight forms to an examinee when he/she logs on the computer.

From Aug. 1st, 2005 to July 31st, 2006, there were 408 international students taking OEPT at a large Mid-western American university, including 102 Chinese students. Among the 102 Chinese students, 7 students scored 3, 62 students scored 4, 33 scored 5 and none scored 6. The passing rate of Chinese students is 32.35%. From Aug. 1st, 2006 to July 31st, 2007, there were 435 international students taking part in OEPT, including 99 Chinese students. Among these 99 students, 6 scored 3, 65 scored 4, 28 scored 5, none scored 6. The passing rate is 28.28%. The director of OEPP (Oral English Proficiency Program) instructed her students to make a descriptive statistical analysis of the OEPT data in terms of temporal measures of fluency as indices of oral English proficiency. See Table 1.

2. Variables and definitions

The variable labels in Table 1 are as follows:

SP – Silent Pause Time

FP – filled Pause Time,

ST – Speech Time,

TR – Total Response Time,

MSR = Mean Syllables per Run = # Syllables/# of Runs (Runs = speech between pauses ≥ 0.25),

Speech Rate = # Syllables/Total Response Time (TR)*60 (TR=SP+FP+ST),

Articulation Rate= # Syllables/(FP+ST) *60

Speech rate is defined as syllables per minute, total number of syllables uttered by total length (in seconds) of speech sample multiplied by sixty. (Kormos and Denes, 2004)

Articulation rate is defined as total syllables produced in speech sample divided by total time required to produce those syllables multiplied by 60. (Cucchiari, Helmer & Boves, 2000; Kormos and Denes, 2004)

Mean Length of Run (MLR) is defined as total number of syllables /phonemes in speech sample divided by total number of run of speech. (Cucchiari, Helmer & Boves, 2000; Kormos and Denes, 2004)

Phonation time ratio is defined as total time spent speaking divided by total time to produce speech sample, ST/TR. (Cucchiari, Helmer & Boves, 2000; Kormos and Denes, 2004)

As to the definition of filled pauses, here're two definitions of them:

Definition 1: A filled pause is a conventional – though non-word – expression used to stall for time during the processing of spontaneous speech.

Definition 2: [F]illers are sounds or words that are spoken to fill up gaps in utterances

As far as pausing phenomenon is concerned, there have been many scholars who use different terms to interpret pausing phenomena from different perspectives. Kowal and O'Connell (1980) distinguish between filled and silent pauses, stating that the later are associated with “the generation of meaning or a more cognitive aspect of processing” (p.63). Similarly, Sabine and Drommel (1980) classify filled pauses within a group of labeled pauses of dissipation – pauses that are unintended by the speaker and “do not facilitate speech processing”. Hieke (1981) puts hesitation phenomena into two broad categories: stalls – which among other phenomena includes silent and filled pauses; and repairs – including false starts and repeats. Unlike Sabine and Drommel who interpret “filled pauses” as “...unintended by the speaker and do not facilitate speech processing”, Olynyk, D'Angeljan et al.(1987) distinguish between silent pauses and filled pauses but propose that the use of filled pauses may actually be a sign of the speakers' fluency and ability to avoid long periods of silence.

3. Analysis of the Data

3.1 Silent Pause Time

From table 1, we can see that there are significant differences between fluent speakers (those who scored 5, especially who scored 6) and influent speakers (those who scored 3 or 4) in terms of temporal measures, which echo with our perception of the characteristic differences between fluency and disfluency. For example, Silent Pause Time increases as speakers vary from fluent to most influent, with native speakers of the shortest mean time of 17.21(seconds), 5.0 - 5.5 group of 21.41, 4.0 - 4.5 group of 28.10, while 3.0 - 3.5 group of the longest time, 39.24. Silent Pause Time is undoubtedly a weighty indicator of fluency.

3.2 Filled Pause Time

In Table1, the figures which may be against people's expectation or common sense and on the other hand, which is worth noting, are the Filled Pause Time. Filled pause is usually considered a sign of disfluency, as Sabine and Drommel (1980) classify it as pauses that are unintended by the speaker and “do not facilitate speech processing”. However, the figures of Filled Pause Time in Table 1 show that this assumption is untrue. The filled paused time of students who scored 3.0 - 3.5 is longer – 2.77, while the filled pause time of students who scored 4.0 - 4.5 is 2.47, those scored 5.0-5.5 is 2.52. But the longest Filled Pause Time is that of native speakers. This can be explained that filled pause may be caused by at least two reasons: one is a sign of hesitation and disfluency of non-native speakers with low speaking proficiency; another is a strategy used by native speakers to avoid long period of silence, as Olynyk, D'Angeljan et al.(1987) state: “...the use of filled pauses may actually be a sign of the speakers' fluency and ability to avoid long periods of silence.” In this case, filled pauses are intended strategy which is an indication of speakers' oral skills. The Filled Pause time of students who scored 5.0 - 5.5 is a little bit higher (2.52) than those scored 4.0 - 4.5(2.47), which indicate that those who scored 5.0-5.5 are more skilled than those who scored 4.0 - 4.5 in applying the skill of filled pause. In addition, native speaker group has the largest Sd (3.32) and Max (12.18), with Min of 0.30, while on the other hand, non-native speakers have smaller Sd (2.81, 2.64, 1.74), with Min of 0. This can be explained that all native speakers know the strategy of using filled pauses in spontaneous speech but the degree of using varies greatly. Non-native speakers are more reserved in using filled pauses, some of them adopt it as a skill to avoid silence, while some of them perceive it as a sign of disfluency and never attempt to use it in spontaneous speech, still some people subconsciously use it because of hesitation or disfluency. In conclusion, filled pause is not necessarily a sign of disfluency, it can be used as a strategy to avoid long period of silence in spontaneous speech. But we need to teach students such strategy and encourage them to use appropriately in speech.

3.3 Speech Time and Total Response Time

From the figures of Speech Time and Total Response Time, we can see that it does not mean that the longer speech time, the longer total response time, the more fluent or better. For example, native speakers' speech time ranks third (62.34 against 59.51, 66.49, 73.02) in the comparison group and total response time ranks lowest in the comparison group (82.82 against 101.92, 97.06, 96.95). This can be explained that native speakers' speeches are more concise but rich in information or content, in other words, the speaking efficiency is high, while non-native speakers' speeches are not as effective (essential) and efficient as native speakers. There's lots of redundancy, repetition, empty or inadequate expression of ideas in their speeches.

It's reasonably easy to understand the two ratio comparisons in Table 1, SP/TR (Silent Pause Time/Total Response) and ST/TR (Speech Time/Total Response). Native speakers have the lowest ratio of SP/TR, while the most disfluent speakers have the highest SP/TR, which indicate that disfluent speakers tend to have longer silence pause time. As to ST/TR (or the phonation time ratio), fluent speakers have higher phonation time ratio than less fluent speakers. Compared with total response time, we can see clearly that, even though those who scored 3.0 - 3.5 have the longest total response time, their speech time is shortest - 59.91, therefore their ST/TR (phonation time ratio) is Low - 0.59, while native speakers, even though their total response time is shortest - 82.82, their ST/TR (Phonation time ratio) is high - 0.75. Since both native speakers and those scored 5.0 - 5.5 have the same ST/TR (Phonation time ratio), as we know there're differences between two these groups of people in terms of fluency, therefore ST/TR is not an adequate index of oral proficiency.

3.4 MSR, Speech Rate and Articulation Rate

Next we will continue to analyze three more important temporal measures: MSR, Speech Rate and Articulation Rate.

MSR = Mean Syllables per Run = # Syllables/# of Runs (Runs = speech between pauses \geq 0.25),

Speech Rate = # Syllables/Total Response Time (TR)*60 (TR=SP+FP+ST),

Articulation Rate = # Syllables/ (FP+ST) *60

Based on the definition and the calculation formula of speech rate and articulation rate on page 2 and 3, we can see from Table 2 that, with the same speech time and filled pause time, speech rate and articulation rate differ in that the calculation of speech rate includes silent pause time while the calculation of articulation rate excludes silent pause time. Therefore speech rate is lower than articulation rate as far as each examinee is concerned. In Table 2, from the comparison of the ratio of the mean (of MSR) of native speakers versus the mean (of MSR) of non-native speakers, with the ratio of the mean of (Speech Rate) of native speakers versus that of non-native speakers, and with the ratio of the mean of (Articulation Rate) versus that of non-native speakers, we can see that MSR is a better index of oral proficiency. For example, as far as articulation rate is concerned, the mean of native speakers is 1.15 times that of group 5.0 - 5.5, 1.21 times that of group 4.0 - 4.5, 1.31 times of group 3.0 - 3.5. As far as speech rate is concerned, the mean of native speakers is 1.18 times that of group 5.0 - 5.5, 1.36 times that of group 4.0 - 4.5, 1.69 times of group 3.0 - 3.5. In contrast, as far as MSR is concerned, the mean of native speakers is 1.49 times that of group 5.0 - 5.5, 1.78 times that of group 4.0 - 4.5, 2.33 times of group 3.0 - 3.5. Why MSR is a better indicator than speech rate or articulation rate can also be explained in the following way: in his Ph. D. dissertation: *The Potential of Text - based Internet Chats for Improving ESL Oral Fluency*. Ph.D. dissertation (p107-108), Christopher Grant Blake compares two speech samples by means of speaking rate and MSR:

Speech Sample 1	Speech Sample 2
Speaking Rate=2.99	Speaking Rate=3.2
Phonation Time Ratio=0.64	Phonation Time Ratio=0.73
Articulation rate=4.63	Articulation Rate=4.34
Mean Length of Run = 7.25	Mean Length of Run = 6

Even though the second speaker has a higher speaking rate and phonation time ratio than that of the first speaker, the second speaker has a lower Mean Length of Run, which was caused by more frequent pauses that did not fall at grammatical boundaries. So we can draw conclusion that MSR is a better indicator of oral fluency than Speech Rate or Articulation Rate.

4. Implications

Based on the above analysis of temporal measures of fluency as indices of oral proficiency, we can get meaningful implications on Spoken English teaching. Temporal measures of Silent Pause Time, Filled Pause Time, Speech Time, Phonation Time Ratio, Mean Syllables per Run, Speech rate and Articulate Rate, etc are effective indices of oral proficiency. MSR is a better index of oral proficiency than Articulation Rate or Speech Rate. Filled pause is not necessarily a sign of disfluency; it can also be a sign of fluent speakers' strategy to avoid long periods of silence.

Therefore language teachers need to demonstrate and impart the features of spoken English and the strategies of making spontaneous speech to their students. Spoken English testing is an assessment of students' oral proficiency, and it's also a reflection of Spoken English Teaching. Based on the examinees' oral speech data and raters' comments on examinees' speech, language teachers and researchers need to find out and analyze the common problems of ESL speakers in spoken English in terms of phonetic sounds, intonation, stress, rhythm, vocabulary and syntax, especially the effective and meaningful expression of ideas. Thus, teachers need to instruct students with knowledge and skills of spoken English and train students to express rich and informative ideas in a more concise and idiomatic way. So spoken language testing need to be combined with and serve for spoken English teaching so as to enable students to improve speaking ability effectively and efficiently.

The author designed and conducted a pilot study on the spoken English teaching in China. The pilot study questionnaire (see appendix) was designed under the instruction of the author's sponsor and instructor in the large Mid-western American University. The questionnaire was directed at the science students who graduated from Chinese colleges and universities with a B.S. or a M.S. in order to get information on the English learning, especially spoken English teaching in China. Based on the data obtained in the pilot study, we can bear out the fact that spoken English teaching has long been ignored in college English teaching. Students' knowledge about English phonetics, rhythm, stress, intonation as well as the differences between written English and spoken English is very limited. They lack a systematic and regular training in spoken English. That's why we can see that the passing rate of Chinese students who took OEPT at the large Mid-western American university is 32.35% (2005.8 – 2006.8) and 28.28% (2006.8 – 2007.8). Because students lack knowledge of spoken English, for example, they don't know that "filled pause" is a feature of spoken English, the majority of Chinese students never use "filled pause"; instead, they have longer silent pause time. In contrast, native speakers use "filled pause" more often instead of "silent pause". See Table 1, the mean of "Silent Pause Time" of the native speakers is 17.21 while Chinese students are: group (3.0 - 3.5) is 39.24, group (4.0 - 4.5) is 28.10, and group (5.0 - 5.5) is 21.41. The mean of "Filled Pause Time" of the native speakers is 3.27 while Chinese speakers are: group (3.0 - 3.5) is 2.77, group (4.0 - 4.5) is 2.47, group (5.0 - 5.5) is 2.52. And also, it can be explained that because of Chinese students' lack of training in spoken English, even though their response time is longer than native speakers, their MSR (Mean Syllables per Run) is much smaller than that of native speakers. The mean of the "Total Response Time" of native speakers is 82.82 while Chinese speakers are: group (3.0 - 3.5) is 101.92, group (4.0 - 4.5) is 97.06, group (5.0 - 5.5) is 96.95. The mean of MSR of native speakers is 11.43 while Chinese speakers are: group (3.0 - 3.5) is 4.90, group (4.0 - 4.5) is 6.41, group (5.0 - 5.5) is 7.64. So we can come to the conclusion that native speakers' speeches are more informative, effective and efficient while Chinese students' speeches are wordier, recurrent and lack of essence.

In conclusion, the quantitative method of using temporal variables as indices of oral English proficiency is a meaningful and effective way to analyze examinees' oral speech. The method of temporal variables lays statistic foundation for the analysis and research on the test of oral speech. It reveals an examinee's oral proficiency in a more direct, scientific and convincing way. The data obtained by means of this method also sheds light on spoken English teaching. In the 21st century, English teaching in the science colleges and universities in China is attaching a growing importance towards spoken English. Besides written test, there is also spoken English test in the national college English test band 4 and 6. Spoken English is especially tested in TOEFL and IELTS. However, spoken English teaching has long been a weak link in the science colleges and universities in China. With spoken English getting more and more concern in China, this quantitative method of using temporal variables is going to receive growing concern in the research of oral English test in China, which will in turn reveal the problems in spoken English teaching and give directions for improvement. Therefore the researching on spoken English test needs to be launched in China now and the teaching of spoken English needs to be strengthened.

References

- Bachman, L.F. (1990). *Fundamental Considerations in language Testing*. Oxford: Oxford University press.
- Blake, Christopher Grant. (2006). *The Potential of Text-based Internet Chats for Improving ESL Oral Fluency*. Ph.D. dissertation, Purdue University, 187 pages; AAT 3239774.
- Brown, J.D. (1988). *Understanding Research in Second Language Learning*. Cambridge: Cambridge University Press.
- Drommel, R.H. (1980). Towards a subcategorization of speech pauses. In H.W. Dechert & M. Raupach (Eds.), *Temporal Variables in Speech*. The Hague: Mouton Publishers.
- Ebel, R.L. & Frisbie, D.A. (1991). *Essentials of Educational Measurement*. Englewood Cliffs, NJ: Prentice-Hall, Inc.
- Ginther, April. Temporal measures of fluency as indices of oral English proficiency. Ninth Annual MwALT (Midwestern Association of Language Testing) Conference at University of Michigan, Oct., 2007.
- Hieke, A.E. (1985). A Componential Approach to Oral Fluency Evaluation. *The Modern Language Journal*, 69 (2), 135 – 142.

- Krashen, S.D. (1982). *Principles and Practice in Second Language Acquisition*. Oxford: Pergamon.
- Kormes, J., & Denes, M. (2004). Exploring measures and perceptions of fluency in the speech of second language learners, *System*, 32, 145 - 164.
- Olynyk, M., D' Anglejan, A., & Sankoff, D. (1987). A quantitative and qualitative analysis of speech markers in the native and second language speech of bilinguals. *Applied Psycholinguistics*. 8 (121-136).
- Qin, Xiaoqing. (2003). *Quantitative Data Analysis in Foreign Language Teaching*. Wuhan: Central China Institute of Science and Technology Press.
- Zou, Shen. (2005). *Language Testing*. Shanghai: Shanghai Foreign Languages Education Press.

Appendix

A Survey on Spoken English Teaching in the Universities of Science and Engineering in Mainland China
2007.11

Instruction:

Please answer all of the items that apply to you; if any question is not applicable, skip to the next one. Either tick the appropriate answer or fill in the blanks.

A. Demographic information:

1. Your gender: male female
 2. Your age:
 18-22 23-26 27-30 above 30
 3. Department: _____
 4. Degree you are pursuing:
 Undergraduate Master's Ph.D.
 5. How long have you been living in the United States? _____ (years)
 6. Have you ever taken the TOEFL ibt?
 yes no
- Have you ever taken IELTS?
- yes no
7. What was your score of spoken English test in TOEFL or IELTS?
Score of spoken English in TOEFL _____
Or Score of spoken English in IELTS _____
 8. Which university did you graduate from in China? _____
What was your major when you pursued undergraduate degree in China? _____

B. Survey on spoken English teaching:

When you were pursuing undergraduate degree in China,

- 1 .Did you take Intensive English reading class? If yes, for how many semesters did you have the Intensive English reading class?
 yes no 1 2 3 4
2. How often do you have your Intensive English reading class?
 once a week twice a week three times a week Not applicable
3. What was the teaching mode of your Intensive English reading class in college?
 in a traditional classroom, without a multimedia computer
 in a traditional classroom, with a multimedia computer
 autonomous learning in a computer lab, without an instructor
 autonomous learning in a computer lab, with an instructor
 other : _____

4. Did your English teacher incorporate any oral activities/ discussions in each Intensive English reading class?
 yes no
5. How long do oral activities /discussions take up in each Intensive English reading class? (Here each class refers to 2 sessions of 110 minutes)
 0 mins 5-10mins 10-20 mins 20-30 mins 30-40mins
6. What was the average amount of time each student's speaking English in the Intensive English reading class?
 0mins 1-3 mins 3-5 mins 5-10 mins
7. What textbook did you use for your Intensive English reading class in college? Title _____
Publishing House _____
8. Did you take any Extensive English reading class? If yes, for how many semesters did you have the Extensive English reading class?
 yes no 1 2 3 4
9. How often do you have your Extensive English reading class?
 once a week twice a week three times a week Not applicable
10. Did you take any Listening and Speaking English class? If yes, for how many semesters did you have the Listening and Speaking English class?
 yes no 1 2 3 4
11. How often do you have your Listening and Speaking English class?
 once a week twice a week three times a week Not applicable
12. What was the teaching mode of your Listening and Speaking English class?
 in a traditional classroom, without a multimedia computer
 in a traditional classroom, with a multimedia computer
 in a multimedia computer lab with an instructor
 autonomous learning in a computer lab without an instructor
 autonomous learning in a computer lab, with an instructor
 other : _____
13. What was the average amount of time each student's speaking English in the Listening and Speaking English class?
 0mins 1-3 mins 3-5 mins 5-10 mins
14. What textbook did you use for your Listening and Speaking English in college?
Title _____ Publishing House _____
15. Did you take Listening English class? If yes, for how many semesters did you have the Listening English class?
 yes no 1 2 3 4
16. What was the teaching mode of your Listening English class?
 in a traditional classroom, without a multimedia computer
 in a traditional classroom, with a multimedia computer
 in a multimedia computer lab with an instructor
 autonomous learning in a computer lab without an instructor
 autonomous learning in a computer lab, with an instructor
 other : _____
17. Did you take any Speaking English class? If yes, for how many semesters did you have the speaking English class?
 yes no 1 2 3 4
18. If you had Speaking English class when you were pursuing undergraduate degree in China, was it a required course or an elective course?
 required elective
19. What was the teaching mode of your Speaking English class?

- in a traditional classroom, without a multimedia computer
- in a traditional classroom, with a multimedia computer
- in a multimedia computer lab
- autonomous learning in a computer lab without an instructor
- autonomous learning in a computer lab, with an instructor
- other : _____

20. Where was students' speaking ability mainly developed while you were in college?

- in Speaking class
- in Intensive English reading class
- in Listening and Speaking class
- other:

21. How often do you do the following activities in your English class?

	All the time	Most of the time	Sometimes	Never
Group discussion				
Pair work				
Drill and practice				
Making presentations				
Watching videotapes or DVDs				
Debate				

22. What was the degree that your Intensive English reading teacher attached importance to spoken English?

- great importance
- adequate importance
- just so-so
- no importance

23. What was the ratio of your English teacher's speaking English / speaking Chinese in your Intensive English class?

- 10:0
- 8:2
- 6:4
- 5:5
- 4:6
- 2:8
- 0:10

24. What do you think of the oral English of your English teacher who taught you Intensive English reading?

(If you had several English teachers, please make a comment on the teacher who taught you for the longest period)

- very good
- good
- just so-so
- poor

25. Where did you learn the knowledge about English phonetic symbols?

	Yes	No
from middle school English teachers		
from college English teachers		
from books		
from videotapes or DVDs		
from family tutors		
I never learn them		
from other source		

26. How much knowledge do you know about English rhythm and stress?

- know a lot
- know some
- know just a little
- know nothing

27. Where did you learn any knowledge about English rhythm and stress? (Check all that apply)

	Yes	No
from middle school English teachers		
from college English teachers		
from books		
from videotapes or DVDs		
from family tutors		
I never learn them		
from other source		

28. Are you clear about the differences between spoken English and written English?

- know a lot know some know just a little know nothing

29. Did your college English teacher point out the differences between spoken English and written English?

- yes no

30. How influential were the following in the development of your spoken English?

	Not helpful					very helpful	
	1	2	3	4	5	6	7
your middle school English teachers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
your college English teachers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
native speakers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
English lectures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Books	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
videotapes/DVDs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
other source:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

31. Since you came to the U.S., how helpful were the following in improving your spoken English?

	Not helpful							very helpful						
	1.	2.	3	4	5	6	7	1.	2.	3	4	5	6	7
taking courses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
participating in class discussions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
making presentations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
participating in social / cultural activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
going to church	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
watching TV or DVDs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
other _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

32. What textbook of English Listening and Speaking have you found most helpful?

Title _____ Publishing House _____

33. What is the degree that you attach importance to spoken English?

- great importance adequate importance
 just so-so no importance

34. In your opinion, how much time of Intensive English reading class in China should be devoted to activities of speaking English?

- 2/3 1/2 1/3 1/4 0

35. Do you think it is necessary to set up a spoken English class for non-English majors in the universities of science

and engineering in mainland China?

- yes no

36. Do you think the English speaking ability you acquired through college English courses is sufficient for your studying abroad or not?

- yes no

37. Do you have any experience of text-based Internet chats in English?

- yes no

38. Do you think text - based Internet chats can help develop oral English fluency or not?

- yes no

39. Can you list any advantages and disadvantages of text-based Internet chats?

Advantages

- 1) _____
- 2) _____
- 3) _____

Disadvantages

- 1) _____
- 2) _____
- 3) _____

40. Did you have any experience of learning English in autonomous learning mode?

- Yes No

41. What do you think of learning English in autonomous learning mode?

- More effective than traditional mode of learning
- As effective as traditional mode of learning
- Not as effective as traditional mode of learning
- Autonomous learning mode should be combined with traditional mode
- No opinion

42. To develop students' oral ability, do you have any suggestions on college English teaching reforms in mainland China?

Table 1. Descriptive statistics – Selective Temporal Variables

Temporal measures of fluency as indices of oral English proficiency

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Descriptive Statistics -- Selected Temporal Variables

Variable	Group	N	Mean	Sd	Min	Max
Silent Pause Time (SP)	1 (3.0-3.5)	18	39.24	11.68	15.26	58.76
	2 (4.0-4.5)	17	28.10	7.12	16.66	39.56
	3 (5.0-5.5)	15	21.41	7.31	10.45	35.24
	4 (NS)	11	17.21	6.96	6.55	28.17
Filled Pause Time (FP)	1 (3.0-3.5)	18	2.77	2.81	0	9.38
	2 (4.0-4.5)	17	2.47	2.64	0	9.52
	3 (5.0-5.5)	15	2.52	1.74	0	5.03
	4 (NS)	11	3.27	3.32	.30	12.18
Speech Time (ST)	1 (3.0-3.5)	18	59.91	12.25	34.38	80.06
	2 (4.0-4.5)	17	66.49	17.55	44.20	97.81
	3 (5.0-5.5)	15	73.02	14.88	42.18	93.54
	4 (NS)	11	62.34	20.90	29.29	90.48
Total Response (TR)	1 (3.0-3.5)	18	101.92	17.65	67.19	118.04
	2 (4.0-4.5)	17	97.06	20.16	63.74	117.35
	3 (5.0-5.5)	15	96.95	18.33	66.34	117.13
	4 (NS)	11	82.82	28.00	40.00	118.24
SPI/TR	1 (3.0-3.5)	18	.38	.08	.18	.50
	2 (4.0-4.5)	17	.29	.08	.15	.41
	3 (5.0-5.5)	15	.22	.06	.11	.33
	4 (NS)	11	.20	.04	.14	.26
ST/TR (Phonation time)	1 (3.0-3.5)	18	.59	.08	.48	.80
	2 (4.0-4.5)	17	.67	.07	.58	.84
	3 (5.0-5.5)	15	.75	.06	.63	.83
	4 (NS)	11	.75	.06	.64	.84
MSR	1 (3.0-3.5)	18	4.90	.99	3.41	6.71
	2 (4.0-4.5)	17	6.41	1.71	4.33	10.66
	3 (5.0-5.5)	15	7.64	1.31	5.22	10.08
	4 (NS)	11	11.43	2.20	7.81	14.73
Speech Rate	1 (3.0-3.5)	18	129.04	28.67	87.07	180.76
	2 (4.0-4.5)	17	159.84	24.31	110.01	215.19
	3 (5.0-5.5)	15	185.04	15.14	165.47	206.95
	4 (NS)	11	217.89	28.27	158.37	252.89
Articulation Rate	1 (3.0-3.5)	18	208.72	32.19	154.02	268.37
	2 (4.0-4.5)	17	226.57	29.37	175.54	282.37
	3 (5.0-5.5)	15	238.96	21.43	208.79	281.24
	4 (NS)	11	274.44	31.17	211.27	311.63

MSR = Mean Syllables per Run = # Syllables // # of Runs : Runs = speech between pauses \geq .25

Speech Rate = [(# syllables / Total Response Time (TR)) * 60] : TR = (SP + FP + ST)

Articulation Rate = [(# Syllables // (FP + ST)) * 60]

Table 2. Mean of NS/Mean of non-native speakers

Variable	Group	Mean	Mean of NS/Mean of non-native speakers
MSR	1. (3.0-3.5)	4.90	2.33
	2. (4.0-4.5)	6.41	1.78
	3. (5.0-5.5)	7.64	1.49
	4. (NS)	11.43	
Speech Rate	1. (3.0-3.5)	129.04	1.69
	2. (4.0-4.5)	159.84	1.36
	3. (5.0-5.5)	185.04	1.18
	4. (NS)	217.89	
Articulation Rate	1. (3.0-3.5)	208.72	1.31
	2. (4.0-4.5)	226.57	1.21
	3. (5.0-5.5)	238.96	1.15
	4. (NS)	274.44	