## Vocabulary Usage in Second Language Presentations

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## Reference Data：

Brooks，G．（2020）．Vocabulary usage in second language presentations．In P．Clements，A．Krause，\＆ R．Gentry（Eds．），Teacher efficacy，learner agency．Tokyo：JALT．
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While oral presentations are an important part of many university classes，because of the time and effort needed to transcribe spoken presentations for analysis，presentations are an underrepresented area of research．In order to help better understand the vocabulary used in oral presentations， 22 impromptu and prepared presentations from 11 first－year students were analyzed for lexical diversity using three different measures．The lexical diversity of these presentations was then correlated to a measure of the participants＇vocabulary knowledge．While there was a positive relationship between vocabulary knowledge and lexical diversity for all of the presentations，it was only statistically significant（ $\tau=.55, p=.004$ and $\tau=.40, p=.046$ ）for the impromptu presentations．This shows that just having students learn vocabulary may not be enough；teachers also need to take the time to teach their students how to make their academic presentations more lexically diverse．

多くの大学の授業で口頭のプレゼンテーションが重要視されているものの，これまであまり研究が進んでいない領域であ る。口頭プレゼンテーションで使われる語彙についてよりよく理解するため，大学一年生11名が行った，即興的なものと準備 されたものを含む22件のプレゼンテーションについて，語彙の多様性を分析した。そして，多様な言語表現と，発表者の持つ語彙知識の量との相関を調べた。語彙知識と使われた語彙の多様性との間には正の相関が認められたが，統計学的に有意と言えるのは，即興的なプレゼンテーションの方だけであった（ $\tau=.55, ~ \mathrm{p}=.004$ and $\tau=.40, \mathrm{p}=.046)$ 。これにより，学生の語彙学習だけでは学術発表でその語彙を使いこなすには十分でないだろうこと，また，学生がプレゼンテーションの場でより多様 な言語表現を使えるように，教えていく必要があることが分かる。
n many university classes，academic oral presentations are used as a way of 1 introducing learners to genre－specific academic discourse，providing them with an opportunity to use their English skills in a meaningful way and introducing them to a skill that they may need to use in the workplace（Duff，2010；Živković，2014）．Despite the popularity and importance of oral presentations，presenting in front of others can be very cognitively demanding and many learners may lack the core fluency needed to give effective oral presentations（Jordan，1997）．This is further complicated by the fact that Japanese learners may have had very few opportunities to practice academic oral presentations prior to entering university（Brooks \＆Wilson，2014）．Despite the challenges involved in giving academic presentations，university teachers often spend very little time actually teaching students oral presentation skills，leaving students to struggle with the task of acquiring the skills they need to present effectively on their own （Bankowski，2010；Barrett \＆Liu，2019）．This can prove challenging for learners as they not only need to learn to express themselves academically in a foreign language，they also need to learn the academic presentation genre，which contains distinct vocabulary and discourse structures（Carter－Thomas \＆Rowley－Jolivet，2001；Morton，2009）．
For instructors，the task of teaching learners how to present effectively is further complicated by the fact that，unlike skills like academic writing，there is very little research into what constitutes a good academic presentation（Kaur \＆Ali，2017）．The spoken nature of oral presentation means that any research in this area can be tedious and time consuming，often involving transcribing and analyzing large amounts of recorded data．This can be made even more difficult by poor quality audio or video recordings．As a result，instructors often rely on research into the linguistic and stylistic moves of academic writing in order to assist their students with their spoken presentations．This is problematic as linguistic analyses of academic discourse have shown that patterns of communication are linguistically very different between spoken and written academic texts（Biber，2006；Zareva，2016）．This article begins to bridge these gaps by providing insight into the vocabulary learners are likely to use in academic
presentation by examining the lexical differences between two types of presentations: impromptu and prepared.

## Background

Over the past several decades, there has been a focus in second language (L2) literature on measuring the lexical diversity of learners' spoken and written output and examining the effect this has on their ability to communicate effectively in English. This research has looked at the relationship between lexical diversity and language proficiency (e.g., Crossley \& McNamara, 2014; Malvern \& Richards, 2002; Treffers-Daller, Parslow, \& Williams, 2018), the effect lexical diversity has on the scores learners are likely to receive on both spoken and written assessments (e.g., Kyle \& Crossley, 2014), and the impact of factors such as topic (e.g., Yang, Lu, \& Weigle, 2015) and genre (e.g., Staples \& Reppen, 2016) on the lexical diversity of learners' L2 texts.

One interesting finding from these studies is that L 2 learners are less likely to use complicated words in their productive English, even if they are familiar with these words and able to use them in other contexts (Henriksen \& Danelund, 2015). This is problematic because good writers and presenters need to be able to make effective use of their vocabulary (Batia \& Nation, 1995). The importance of being able to produce a lexically diverse text has been demonstrated in the field of L2 academic writing. Research has shown a strong link between high quality writing and lexical diversity in samples produced both by native speakers and L2 learners (Crossley, Weston, McLain Sullivan, \& McNamara, 2011; González, 2017). However, much less is known about the relationship between vocabulary and spoken English. Furthermore, those studies that have looked at this relationship have tended to focus on lexical diversity in the context of speaking tasks (Kyle \& Crossley, 2014) and learner proficiency (Malvern \& Richards, 2002). There have been few studies that have looked at lexical diversity in the context of academic presentations.

## Lexical Diversity

Lexical diversity is usually defined as the "proportion of words in a language sample that are not repetitions of words already encountered" (Jarvis, 2013a, p. 88). Lexical diversity has been shown to be an effective measure of the complexity and quality of learners' L2 language use (Malvern, Richards, Chipere, \& Durán, 2004). Lexical diversity is also important because it can affect how the learner's message is received and has been shown to correlate strongly with the scores learners are likely to receive on both written (Gebril \& Plakans, 2016) and spoken assessments (Kyle \& Crossley, 2014).

## Measuring Lexical Diversity

There are a number of different ways that researchers can use to measure lexical diversity. The most basic of these is type-token ratio (TTR). The token count is measured by counting the total number of words a text contains, while the type count is measured by counting the number of different words in the text. The TTR is then calculated by dividing the number of types in the language sample by the number of tokens (Malvern, Richards, Chipere, \& Durán, 2004). A language sample where all of the words in the text are unique would have a TTR of 1 , and the closer the TTR of a text is to 1 the more lexically diverse that text would be.
One issue with using TTR is that it is sample-size dependent (Jarvis, 2013b) and has been shown to vary inversely with the length of the text. This is because the more tokens there are in a text the more likely it is that the speaker or writer will have to repeat words. The index of Guiraud (Guiraud, 1954) was one early method researchers used to try to correct for this problem. The index of Guiraud is calculated by taking the number of types found in the text and dividing it by the square root of the number of tokens (Koizumi, 2012). While this can help to correct some of the problems associated with TTR, there are still issues with using this measure to calculate lexical diversity. For example, Treffers-Daller et al. (2018) found that Guiraud does not adequately account for subtle differences between learners and that the scores derived from using this method flatten out as texts get longer.
A more recent approach to calculating lexical diversity is the measure of textual lexical diversity (MTLD; McCarthy, 2005). The MTLD is measured by cutting the text into segments with a constant TTR (usually around 0.72 ) and then calculating the average number of words in each of these segments (Jarvis, 2013a). Because MTLD works by dividing the text into smaller sections it allows for the comparison of texts with different lengths. While there are still limitations with using MTLD, including the fact that it does not evaluate the text as a unified whole, it is generally thought to be one of the more accurate measures of lexical diversity (Jarvis, 2013b).

## Lexical Diversity and Written Texts

Numerous studies have looked at the relationship between L2 writing and lexical diversity. In one of the earlier studies in this field, Engber (1995) looked at 67 L2 compositions written by intermediate learners of English. Using the TTR, he found a substantial correlation between the holistic ratings these compositions received and their lexical diversity. In a more recent study, McNamara, Crossley, and McCarthy (2010)
looked at the relationship between lexical diversity and the rating essays received using a corpus of expert-graded essays. In this study, lexical diversity, as measure by MTLD, was shown to be one of the most statistically significant predictors of essay quality.
However, despite the importance of lexical diversity in academic writing, studies have shown that L2 learners struggle to produce lexically diverse texts. In a comparison between the vocabulary found in the writing of 17 -year old Swedish learners of English and first language English (FLE) speakers, Linnarud (1986) found that the compositions of Swedish learners showed much less diversity than those written by their FLE counterparts, especially in terms of the different adjectives and adverbs used. In three different studies of the lexical diversity of Danish learners of English, Henriksen and Danelund (2015) found that these learners were reluctant to use low-frequency words in their academic composition, resulting in these compositions receiving low scores of lexical diversity. Even when learners were familiar with the low-frequency words they were still reluctant to use them in their writing, preferring instead to use more familiar high frequency words, something that they referred to as "lexical-teddy bears" (p. 30).

## Lexical Diversity and Spoken Texts

While less research has been done on the relationship between lexical diversity and spoken text production, the studies that have been conducted support the claim that there is a relationship between lexical diversity and oral proficiency. Daller, Van Hout, and Treffers-Daller (2003) looked at the lexical diversity in the oral production of Turkish-German bilinguals. Using Advanced TTR and Guiraud Advanced, they found significant correlations between learners' language proficiency and the lexical diversity of their oral production. In another study, $\mathrm{Yu}(2010)$ looked at the lexical diversity of 25 samples taken from the spoken and written sections of the Michigan English Language Assessment Battery. He found that the lexical diversity of the learners' written and spoken English text were positively correlated. He also found that the lexical diversity of the text had a much greater impact on the scores the learners were likely to receive for the oral section of the assessment.

## Aims of the Research

This research builds upon these previous studies by examining the relationship between learners' vocabulary knowledge and the lexical diversity of their oral presentations. This is done by looking at the lexical diversity of two different types of oral presentations, impromptu and prepared, over the course of a semester. Accordingly, this study includes
three research questions:

1. To what degree is the lexical diversity of learners' prepared and impromptu presentations related to their vocabulary knowledge?
2. Is this relationship stronger for impromptu or prepared presentations?
3. Of the different measures of lexical diversity, which is the most effective for measuring this relationship?

## Methodology

## Subjects

The participants of this study were 11 first-year university students enrolled in a private university in Japan. All of the participants were part of a first-year academic presentation and discussion course designed to prepare the students to study abroad in a university setting where English was the means of instruction. The course met twice a week for 15 weeks. All of the participants in this study gave informed consent to have their presentations, which were recorded as part of their course assessment, and their vocabulary scores used in this research project. The project was also cleared with the university's institutional review board prior to commencing with the research.

## Procedure

As part of their course the participants were asked to give formal presentations (i.e., present in front of the class) 12 times during the semester, both individually and as part of a group. These presentations were divided into two types: prepared and impromptu. For the prepared presentations, students were given a topic that they were required to research; they then had to give a 2 - to 4 -minute oral presentation on that topic in front of the class. Participants were encouraged, but not required, to write a script for these presentations and were given time in class to practice presenting. The participants were also able to use PowerPoint slides to help them with their prepared presentations.

For the impromptu presentations the participants were asked to draw a topic from a hat before the start of the presentation. The topics were related to those used for the prepared presentations. For example, in their initial prepared presentation students were asked to research and present on a place in Japan. The topics of the concurrent impromptu presentations were related to traveling in Japan such as "Where in Japan would you like to go during Golden Week and what would you do there?" After choosing a topic, the participants were given a minute to prepare for their presentations and then presented on the topic for two to three minutes in front of the class.

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For both the prepared and impromptu presentations, the participants were encouraged to use an academic presentation style including providing an outline of their presentation in the introduction and using sequencers and transitional phrases to move between the sections of their presentation. Recordings of the participants' impromptu and planned presentations were collected throughout the semester as part of their assessment. For the purpose of this research, the impromptu and planned presentations from the middle and end of the semester were transcribed and analyzed for their lexical diversity. For the prepared presentation at the end of the semester, the penultimate rather than the final academic presentation was used, as the final presentation was different in style from the other presentations. Students were also asked to complete an online version of the updated Vocabulary Levels Test (uVLT; Webb, Sasao, \& Ballance, 2017) during class time to determine their vocabulary knowledge.

The recordings of the presentations were transcribed for analysis in two stages. During the first stage, the interviewees' utterances were transcribed by a professional and double-checked by the researcher. Since no pragmatic or fluency analysis was to be performed, nonlinguistic features such as laughter and pause markers were omitted. Apart from that, the presentations were transcribed word for word. During the second stage, the transcriptions were cleaned for analysis. Disfluencies that would have affected the analysis of the transcript were removed (such as students repeating a single word multiple times as they were thinking about what to say next), and Japanese words and the proper names of people or places were tagged so that they could be removed during the analysis.

## Analysis

After the transcription was completed, the text files of the presentations were run through version 1.4.1 of AntWordProfiler (Anthony, 2014) to get the basic type and token count and to determine the average length and the lexical sophistication for each of the presentations. This was used to determine the TTR and Guiraud for each of the presentations. For the lexical diversity analysis, the presentations were imported into the TextInspector program (textinspector.com), an online tool for analyzing textual diversity. The MTLD was calculated for each presentation. The length, TTR, Guiraud, and MTLD for each of the presentations were entered into Excel. The two presentations of each of the two types were averaged together to provide an average length, TTR, Guiraud, and MTLD score for each participant's impromptu and prepared presentations.
The $u$ VLT scores from each of the participants $(n=11)$ were paired with the lexical diversity scores of both their impromptu and prepared presentations. These were then
modelled using Kendall's tau correlation in order to determine the relationship between the participant's lexical diversity and vocabulary knowledge scores. The small size of the data set meant that it was not possible to calculate the $p$ value using the normal formulas, so bootstrapping (Field, Miles, \& Field, 2012) was used to determine the confidence interval of the six data sets. Bootstrapping gets around the problems caused by a small sample size by estimating the properties of the sampling distribution from the sample data (Bruce, 2015). It does this by treating the sample data as the population and drawing smaller samples from this data, putting back the data before a new case is drawn. The correlational coefficient can then be calculated from each of these samples and the standard deviation of the sampling distribution of the bootstrapped samples can be used to estimate the standard error of the correlational coefficient (see Wright, London, \& Field, 2011). From this standard error, confidence intervals and significance tests can be computed. This was done in R by first calculating the correlational coefficient and then using a bootstrapping function to resample each of the data sets 2000 times to determine their $p$ values.

## Results

The first area of interest in this study was the vocabulary level of each of the participants. As expected, an analysis of the uVLT showed that a majority of the participants were able to master the higher-frequency word bands while only a few showed mastery of the lower-frequency bands (see Table 1).

Table 1. Descriptive Statistics of the uVLT Scores

|  | $1 \mathbf{K}$ | $\mathbf{2 K}$ | $\mathbf{3 K}$ | $\mathbf{4 K}$ | $\mathbf{5 K}$ |
| :--- | :---: | :---: | :---: | :---: | :---: |
| Mean | 29.82 | 28.91 | 25.09 | 22.45 | 18.64 |
| Mean \% | $99.4 \%$ | $96.4 \%$ | $80.6 \%$ | $71.8 \%$ | $60.0 \%$ |
| SD | 0.60 | 1.14 | 4.64 | 5.39 | 6.04 |
| Mastery | 11 of 11 | 11 of 11 | 6 of 11 | 2 of 11 | 1 of 11 |

Note. Numbers at the top of the table represent the frequency band found using the BNC/COCA word lists. Participants needed to score $86 \%$ on a band ( 26 correct out of 30 ) to achieve mastery of that band.

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An analysis of the presentations showed that the length of the prepared presentations was longer than that of the impromptu presentations (see Table 2). It also showed that the number of words per minute was much higher for the prepared presentations, meaning students spoke for more time in these presentations and were able to do so more fluently.

Table 2. Descriptive Statistics for the Presentation Data

|  | Number of Samples | Words | Average Words | Average Time |
| :--- | :---: | :---: | :---: | :---: |
| Prepared | 22 | 7268.0 | 330.36 | $2: 49$ |
| Impromptu | 22 | 3140.0 | 142.70 | $1: 57$ |

As expected, the majority of the words in both the prepared and impromptu presentations were from the first 2000 most frequent word bands based on the BNC/ COCA (Nation, 2017). The impromptu presentations had slightly more words in the first 2000 -word bands with $95.8 \%$ compared to $95.48 \%$ (see Table 3). There were also more low-frequency and off-list words in the prepared presentations, which is understandable given that these presentations were on academic topics and the participants were able to use a dictionary when preparing for them.

Table 3. Vocabulary Profile of the Presentations

|  | 1K | 2K | 1K \& 2K | 3K | 4K | 5K-11K | Off-List |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Prepared | $91.70 \%$ | $4.00 \%$ | $95.48 \%$ | $1.00 \%$ | $0.40 \%$ | $2.00 \%$ | $1.00 \%$ |
| Impromptu | $89.80 \%$ | $5.70 \%$ | $95.60 \%$ | $1.80 \%$ | $1.00 \%$ | $1.50 \%$ | $0.00 \%$ |

Note. Numbers at the top of the table represent the frequency band found using the BNC/COCA word lists.

An analysis of the relationship between the lexical diversity of the prepared and impromptu presentations showed a positive correlation between the participants vocabulary knowledge and the lexical diversity of their presentations for all measures except for the prepared TTR presentations (see Table 4). However, the only measures that this was statistically significant for were the Guiraud and the MLTD, and only for the impromptu presentations ( $\tau=.55, p=.004$ and $\tau=.40, p=.046$ for the Guiraud and MLTD respectively).

Table 4. Comparison of Vocabulary Knowledge and Lexical Diversity

|  | TTR |  | GI |  | MLTD |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\boldsymbol{\tau}$ | $\boldsymbol{p}$-value | $\boldsymbol{\tau}$ | $\boldsymbol{p}$-value | $\boldsymbol{\tau}$ | $\boldsymbol{p}$-value |
| Prepared | -0.29 | .81 | 0.40 | .07 | 0.04 | .51 |
| Impromptu | 0.24 | .08 | 0.55 | $.004^{* *}$ | 0.40 | $.046^{*}$ |

Note: * $p<.05$, ** $p<.01$, **** $p<.001$

## Discussion

In response to the first research question, although there was a statistically significant relationship between the participants' vocabulary knowledge and the lexical diversity of their impromptu presentations, there was no statistically significant relationship between their vocabulary knowledge and the lexical diversity of their prepared presentations. It is worth noting that participants did tend to use more complex words in their prepared presentations. This can be seen by the greater percentage of words in the 5 K to 11 K frequency bands and off-list words used in the prepared presentations. On the other hand, the impromptu presentations tended to have more mid-frequency words, such as those in the 3 K and 4 K frequency bands. The vocabulary in both sets of presentations was primarily composed of words coming from the high-frequency 1 K and 2 K bands.
In response to research question two, while the participants' vocabulary knowledge was likely to have an effect on the lexical diversity of their impromptu presentations, it did not seem to affect the lexical diversity of their prepared presentations. This may be because the participants had time to prepare for these presentations and were able to do so using a dictionary. Participants with lower levels of vocabulary proficiency were able to spend more time choosing the vocabulary for their presentations and could look up unfamiliar words. This mirrors what other studies have shown about the lexical diversity of learners' written texts: when learners are given time and can use a dictionary, vocabulary knowledge is less likely to be a factor in determining the lexical diversity of the texts they produce than other factors such as the learners L1 writing style (Brooks \& Brooks, 2017).

Finally, of the three measures of lexical diversity, only Guiraud and MTLD were shown to be statistically significant. Because TTR tends to reward shorter presentations, some of the shorter impromptu presentations by the lower-proficiency participants received quite high scores of textual diversity. This highlights the problems with using TTR as

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a measure of lexical diversity for learner-produced texts. While the Guiraud measure is also sensitive to text length, because all of the texts in this study were of similar lengths, compensation for the differences in text length was possible. However, as Guiraud becomes less effective when the text lengths get longer (Treffers-Daller et al., 2018), MTLD may have shown itself to be better at determining lexical diversity than the other two measures if the study had included longer presentations.

## Conclusion

While this was a small-scale study and only involved 11 participants, it provided some insight into the relationship between learners' vocabulary knowledge and the lexical diversity of their presentations. It also illustrated the differences between impromptu and prepared academic presentations with regards to the types of words learners are likely to use. In the future, it would be helpful to look at this with a larger group of participants. It would also be useful to look at the relationship between the lexical diversity of different modes of production. Furthermore, this study looked at the lexical diversity of two different types of presentations, impromptu and prepared. This could be expanded in the future to include things like poster presentations.
One other limitation of the study was the fact that the students' working memory was not taken into account. The challenges of remembering and using unfamiliar words in an academic presentation suggests that working memory could potentially influence learners' ability to use unfamiliar words in their presentations. In the future, a nonlinguistic working memory task, such as the backward digit span working memory task from the Automated Working Memory Assessment (AMWA; Alloway, 2007) could be used to measure the participants' working memory. A multiple regression analysis could then be used to determine if working memory influenced the learners' ability to use diverse vocabulary in both their prepared and impromptu presentations.
Given that the participants wrote out their prepared presentations, it is not surprising that the lexical diversity of these presentations was different than that of the impromptu presentations. However, the lack of a correlation between the learners' vocabulary knowledge and the lexical diversity of their prepared presentations does highlight the fact that just having learners memorize more low-frequency words is probably not enough to increase the lexical diversity of their output; students need to be taught how to create lexically diverse texts. This is similar to the findings of other studies on the lexical diversity of learners L2 written texts (Henriksen \& Danelund, 2015). Because of this, with prepared presentations it may be beneficial for teachers to encourage their students to look at their scripts, both at home and in the classroom, and find places
where they can use a greater variety of vocabulary. Given the importance of lexical diversity for assessment purposes (Kyle \& Crossley, 2014), helping students to use more unique words in their presentations will help them to both gain greater master over their vocabulary and to get better scores on their oral presentations.

By showing that even learners with higher levels of vocabulary proficiency are still not producing lexically diverse presentations, it is hoped that teachers reading this article will consider taking some time in the classroom to help their students begin to use the words that they are being taught. Because lexical diversity is such an important factor in determining how a learners' spoken message is received by the audience, a greater focus on this in the classroom will assuredly help these learners to be able to present more effectively in English.

## Bio Data

Gavin Brooks received his Master of Applied linguistics from the University of New England with a focus on the stages of language acquisition. He has taught English in Japan, Indonesia, Colombia, and Ecuador. For the last 15 years, he has been teaching in Japan and currently works as an Associate Lecturer of English at Kwansei Gakuin's School of Policy Studies. gavinbrooks@gmail.com

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