A Multidimensional Analysis: Speaking Style of Learner Speech across Proficiency Levels

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Abstract

Multidimensional analysis (MDA) is vital for the description of writing style. Several studies have explored factors that may predict the style of learner writing. However, researchers have not treated learner speech in much detail. This paper sets out to examine whether proficiency, gender, and academic genre significantly affect the speaking style of learner speech with a special focus on proficiency. ICNALE Spoken Dialogue (ICNALE SD), a corpus of learner speech, is used in the current study. Results showed that proficiency has a significant effect on Dimension 1, Dimension 2, and Dimension 6. Meanwhile, academic genre has a significant effect on Dimension 6. The findings presented in this paper add to our understanding of learner speech and should be of great value to educational professionals.

1 Introduction

One of the most interesting questions perplexing practitioners in language teaching is how linguistic features change as learners develop. Despite there is a lot of literature centered on it in terms of learner writing, few studies place enough emphasis on the change of linguistic patterns of learner speech with the development of learners' proficiency. In view of important differences between writing and speaking, it is no warrant to presume that findings of writing research can be directly applicable to learner speaking (Biber et al., 2016). Additionally, to get to the root of language, theories of language are suggested to turn to spoken language (Mauranen, 2006). To keep with similar research being conducted with learner writing corpora and extend the body of research into learner speech, this study aims to determine whether proficiency, gender, and academic genre have significant effects on the speaking style of learner speech by applying MDA with a special focus on proficiency.

2 Literature Review

2.1 Learner Speech

Previous studies have investigated learner speech in many aspects. Ishikawa (2015) made an important contribution to the investigation of factors affecting the fluency of second language. Beltrán-Palanques and Querol-Julián (2018) presented an impressive analysis of learner speech from the perspective of pragmatic competence. Chevasco (2019) assessed the second language speaking ability from the perspective of identity. Other studies focused on the semantic level, such as the logical connectors (e.g., Wu, 2019) and stance adverbs in spoken language (e.g., Pérez-Paredes Bueno-Alastuey, 2019). Although these studies have revealed important aspects of learner speech, to date, surprisingly, the speaking style of learner speech has not been empirically studied. Therefore, this paper attempts to give a full account of the speaking style of learner speech using the method of MDA.

2.2 Multidimensional Analysis

MDA is an effective method of exploring the notion of register variation (Halliday, 2005). It was pioneered by Biber in mid-1980s with a view to empirically analyzing the ways in which linguistic features co-occur in texts and how registers dif-

fer in relation to those co-occurring patterns (Biber, 2019). Biber's (1988) seminal research is of great significance as it marks the first attempt to investigate the relationship among general spoken and written registers in English using multivariate statistical techniques. Six dimensions were extracted in Biber's(1988) study, namely, Dimension 1, involved versus informational production; Dimension 2, narrative versus non-narrative discourse; Dimension 3, context-independent discourse versus context-dependent; Dimension 4, overt expression of persuasion; Dimension 5, abstract versus non-abstract information; Dimension 6, on-line informational elaboration. A brief introduction of them is given below.

Dimension 1, involved versus informational production. The positive pole of this dimension is primarily characterized by features including private verbs (verbs expressing intellectual states such as belief and intellectual acts such as discovery which are 'private' in the sense that they are not observable)(Quirk et al., 1985), THAT deletion, contractions, present tense verbs, second person pronouns. These linguistic features function to mark affective, interactional, and generalized content. The negative pole of this dimension is characterized by features including nouns, word length, prepositions, type/token ratio, attributive adjectives, marking high informational density and exact informational content. Usually, if discourse is produced under real-time conditions, the lexical precision and informational density of it will be limited (Biber, 1988).

Dimension 2, narrative versus non-narrative discourse. This dimension is generally characterized by frequent occurrences of past tense and perfect aspect verbs, third person pronouns, public verbs (speech act verbs introducing indirect statements)(Quirk et al., 1985), present participial clauses, and synthetic negation (*no* followed by any adjective and any noun or proper noun, including *neither* and *nor*)(Nini, 2015), which function to mark active, event-oriented discourse. Present tense verbs and attributive adjectives are markedly infrequent on this dimension representing more static, descriptive or expository types of discourse.

Dimension 3, context-independent discourse versus context-dependent discourse. The features with positive weights on Dimension 3 are WH relative clauses on object positions, pied-piping constructions (any preposition followed by *who, who, whose or which*), WH relative clauses on subject positions, marking highly explicit, context-independent reference. The features with negative weights on this dimension are time adverbials, place adverbials, adverbs, marking nonspecific, situation-dependent reference.

Dimension 4, overt expression of persuasion. The features with relatively high positive weights on Dimension 4 are infinitives, prediction modals, persuasive verbs, conditional subordination, and necessity modals, which function together to mark persuasion. There are no negative features on this dimension.

Dimension 5, abstract versus non-abstract information. The features with positive weights on Dimension 5 are conjuncts, agentless passives, past participial clauses, BY-passives, and past participial WHIZ deletions, which mark informational discourse that is abstract, technical, and formal. The only negative weight on this dimension is type/token ratio, as the frequent use of passive and conjuncts in abstract, technical discourse resulting in a relatively low lexical variety.

Dimension 6, on-line informational elaboration. The features with positive weights on Dimension 6 are THAT clauses as verb complements, demonstratives, THAT relative clauses on object positions, and THAT clauses as adjective complements. The co-occurrence of these features works together to signal informational elaboration in relatively unplanned types of discourse. The only negative weight on this dimension is phrasal coordination.

In recent years, there has been a growing number of publications employing MDA. Cao and Xiao (2013) explored the textual variations between native and non-native English abstracts by conducting an MDA. Hardy and Friginal (2016) investigated the genre variation in student writing with reference to dimensions extracted by Hardy and Römer (2013). Zhang (2016) innovatively integrated metadiscourse markers with MDA in her study. Huang and Ren (2020) multidimensionally analyzed the writing style of editorials in China and America. However, the existing literature on MDA primarily concerns writing rather than speaking. What is less clear is learner speech in the framework of MDA. There has

been only a little discussion on this topic. Biber et al. (2002) provided a comprehensive linguistic description of the range of spoken and written registers at American universities. Zhang et al. (2017) explored co-occurrence patterns and register variation of metadiscourse markers in spoken language. However, the corpora used in these studies are mostly preoccupied by Native Speakers (NS) language. Up to now, far too little attention has been paid to the research of learner speech, if any, the corpus used in their studies is outdated and in turn it becomes unclear whether the findings still fit into current situation. Therefore, a new MDA which bases its results on an updated learner corpus is highly required.

2.3 The present study

Factors thought to have effects on the style of learner writing have been explored in a plethora of studies. For example, Pan (2018) carried out a new MD analysis in which she found that proficiency has a significant effect on Dimension 2 (immediate style versus reported style). Kim and Nam (2019) examined the effects of gender, academic major, proficiency, nationality and topic on textual features in a well-designed analysis and found that the effect of proficiency is significant on Dimension 1 and Dimension 5 based on Biber's (1988) model. However, no attempt has been made so far to investigate effects of these factors on the speaking style of learner speech. Therefore, this paper seeks to remedy this situation. It is hoped that this study will contribute to a deeper understanding of learner speech and bring some pedagogical implications to English teachers. In conclusion, this research aims to address the following research questions: (1) To what extent does learner speech differ in speaking style across proficiency levels along the dimensions established by Biber (1988)? (2) What are the possible reasons for the difference?

3 Methods

3.1 Corpus

The corpus used in this paper is The ICNALE Spoken Dialogue (ICNALE SD) released in 2019 and updated on March 2020, a subcorpus of The International Corpus Network of Asian Learners of English (ICNALE) (Ishikawa, 2019). The corpus contains 30-40 minutes oral interviews divided into ten parts. The first is Introduction in which the interviewees are required to answer some questions about English learning asked by interviewers. Two task sets related to two ICNALE common topics including part-time job and non-smoking are placed in the middle of the whole interview. Each task includes four parts, namely, picture description (PD), PD-related QA, Role play (RP), RP-related QA. At the end of each interview, interviewees are asked to answer questions about the whole interview. The corpus is made up of dialogues produced by 405 students (age: M = 20.9, SD = 2.71; gender: female = 221, male = 184; academic genre: Arts = 243; Sciences = 162) and 20 native speakers (age: M = 36.8, SD = 10.2; gender: female = 3, male = 17) with a total of 1,600,000 tokens. To have an effective quantitative analysis, task types are not considered in the current study to ensure the token of each sample is not less than 100 (Jones, 2007). Among 405 learners of English, 135 of them are from ESL regions (Hong Kong, Pakistan, the Philippines, and Singapore) and 290 of them are from EFL regions (China, Indonesia, Japan, Korea, Taiwan and Thailand). Thanks to the detailed background information of participants provided by the corpus, gender, academic genre, proficiency, and L1 are successfully extracted as factors under investigation in this study. All participants have already been divided into four proficiency levels by ICNALE according to the official mapping guidelines offered by administrators of valid tests including TOEFL, TOEIC, IELTS, CET and others, and a second language vocabulary test (VST) participants took through questionnaires. To investigate the effect of academic genre, all the participants are classified into two groups. The first group is students of Arts (N = 243) majoring in Humanities and Social Sciences; the other is students of Sciences (N = 162) majoring in Life Science, and Science and Technology.

3.2 Statistical analysis

With reference to Biber's (1988) model, the current study investigates the effects of proficiency, gender, academic genre on the speaking style of learner speech. Despite the fact that dimensions in Biber's model were extracted from the study of a general corpus of spoken and written text (481 spo-

ken and written texts of contemporary British English, taken from the Lancaster-Oslo-Bergen Corpus and the London-Lund Corpus), they are incontrovertibly considered effective in describing variation in a more specialized field because of a broad sample of texts and registers as well as a carefully sampled linguistic features (Biber, 2006). The analysis tool used in this study is Multidimensional Analysis Tagger (MAT) (Nini, 2015), which is a computer program replicating Biber's (1988) tagger that integrates annotation, analysis, and computation of dimension scores. The model proposed by Biber is valid and MAT is consistent in its application (Nini, 2019). After tagging the text with the Stanford tagger (Toutanova et al., 2003), z-scores of each linguistic feature will be calculated on the basis of the means and standard deviations presented in Biber (1988), then the score of each dimension will be computed automatically by adding up the z-scores of linguistic features that presented a mean higher than 1 in the chart provided by Biber (1988). Next, the data obtained will be processed in R language, using the linear mixed-effects model (LMM) with the help of the lmerTest package for R (Kuznetsova et al., 2017). LMMs are linear in the parameters, and the covariates or independent variables can involve a mix of fixed and random effects (West et al., 2014). Fixed-effect factors have a fixed number of levels that exhaust all possible levels (e.g., gender is either male or female), while random-effect factors have levels sampled from a large population of possible levels (Wieling et al., 2018). Therefore, in this study, gender, academic genre, and proficiency level are taken as fixed factors, and first language (L1) as a random factor. The reason why L1 (16 languages) is used instead of nationalities (10 countries and regions) is that participants from the same country or region may speak different languages, thus having different L1 effects on their speaking style. For example, the mother tongue of participants from Hong Kong can be Mandarin or Cantonese. Additionally, Friginal and Polat's (2015) have confirmed that there is a difference between students with different L1 backgrounds in the use of linguistic features. In view of it, L1 is adopted in the model as a random factor instead of nationalities.

In order to justify the necessity of including the random factor into the model, a simple linear model is built to compare with the linear mixed-effects model. The corresponding p-value based on a mixture of chi-square distributions ($p < 0.05$) suggests the necessity of using L1 as a random factor to build an LMM model instead of a simple linear one. Six analyses of LMMs on different dimensions are carried out respectively. Then, emmeans packages are used to perform a Tukey post hoc analysis to investigate if the main effect or interaction effect between factors is significant.

4 Results

The results of the mean of dimension scores together with standard deviation across proficiency levels, genders, academic genres are displayed in Table 1, Table 2, Table 3, Table 4, Table 5, and Table 6. P values smaller than 0.05 are considered significant and p values between 0.05 and 0.1 are considered marginally significant.

Factors		**Mean**	**SD**	**N**
Proficiency	A2	18.32	9.13	65
	B1_1	22.86	7.41	91
	B1_2	24.31	6.98	173
	B2	26.21	7.00	76
Academic Genre	Arts	23.52	7.50	243
	Sciences	23.17	8.36	162
Gender	Male	22.18	7.91	184
	Female	24.38	7.68	221

Table 1: Descriptive statistics for Dimension 1

Table 1 displays positive dimension scores across proficiency levels, academic genres and genders on Dimension 1. In terms of the effects of fixed factors on Dimension 1, what stood out in the model is Proficiency Level ($F(3, 387.4) = 4.98$), $p < 0.05$). In order to compare the difference across proficiency levels, a Tukey post hoc analysis was performed. Further analysis of the data revealed that there were significant differences between A2 and B1_1 ($t = -2.58$, $p < 0.1$), A2 and B1_2 ($t = -3.25$, $p < 0.05$), A2 and B2 ($t = -3.60$, $p < 0.05$). No significant results were reported between B1_1 and B1_2 ($t = -0.41$, $p > 0.05$); B1_1 and B2 ($t = -1.39$, $p > 0.05$); B1_2 and B2 ($t = -1.21$, $p > 0.05$). The results also showed that more advanced learners of English would get higher dimension scores on this dimension. For the

rest of the fixed factors, none of them were significant statistically. Gender (F(1, 385.6) = 0.98, $p > 0.05$); Academic Genre (F(1, 387.8) = 0.16, $p > 0.05$). Regarding the interaction effect, no significant result was reported: Proficiency Level × Gender (F(3, 382.3) = 0.23, $p > 0.05$); Proficiency Level × Academic Genre (F(3, 382.9) = 1.11, $p > 0.05$); Gender × Academic Genre (F(1, 383.4) = 0.46, $p > 0.05$); Proficiency Level × Gender × Academic Genre (F(3, 382.0) = 0.26, $p > 0.05$). Regarding the random factor, a likelihood ratio test was performed to examine the random effect. The result ($\chi^2(1) = 128.56$, $p < 0.05$) indicated that L1 had a strong effect on Dimension 1.

In order to know the specific linguistic features that lead to the significant difference, linguistics features on Dimension 1 were examined using ANOVA. The specific linguistic features in which learners across proficiency levels differ include private verbs (F(3, 401) = 11.19, $p < 0.05$), THAT deletion (F(3, 401) = 12.76, $p < 0.05$), contractions (F(3, 401) = 3.31, $p < 0.05$), second person pronouns (F(3, 401) = 5.63, $p < 0.05$), demonstrative pronouns (F(3, 401) = 6.41, $p < 0.05$), general emphatics (F(3, 401) = 8.85, $p < 0.05$), first person pronouns (F(3, 401) = 6.06, $p < 0.05$), pronoun IT (F(3, 401) = 8.19, $p < 0.05$), Be as main verb (F(3, 401) = 5.92, $p < 0.05$), causative subordination (F(3, 401) = 4.80, $p < 0.05$), discourse particles (F(3, 401) = 4.46, $p < 0.05$), general hedges (F(3, 401) = 5.65, $p < 0.05$), possibility modals (F(3, 401) = 3.12, $p < 0.05$), WH clauses (F(3, 401) = 8.99, $p < 0.05$), nouns (F(3, 401) = 22.39, $p < 0.05$), word length (F(3, 401) = 18.04, $p < 0.05$), preposition (F(3, 401) = 10.63, $p < 0.05$). Additionally, by generating a mean plot of each linguistic feature, I found a positive correlation between proficiency and linguistic features including private verbs, THAT deletion, contractions, second person pronouns, demonstrative pronouns, general emphatics, Be as main verb, WH clauses and word length. That is to say, as a learner's proficiency develops, he or she tends to use these linguistic features more frequently. Besides, a negative correlation between the frequency of nouns and proficiency was reported.

Table 2 displays negative dimension scores across proficiency levels, academic genres and genders on Dimension 2. The LMM revealed a significance

Factors		Mean	SD	N
Proficiency	A2	-4.14	1.09	65
	B1_1	-3.59	1.10	91
	B1_2	-3.42	1.18	173
	B2	-3.48	0.90	76
Academic Genre	Arts	-3.52	1.20	243
	Sciences	-3.68	1.01	162
Gender	Male	-3.67	1.25	184
	Female	-3.52	1.01	221

Table 2: Descriptive statistics for Dimension 2

in proficiency level (F(3,387.0) = 3.96, $p < 0.05$). Hence, a Tukey post hoc analysis was performed. The results illustrated that there is a significant difference between A2 and B1_2 (t = -3.40, $p < 0.05$), together with marginal significance between A2 and B1_1 (t = -2.51, $p < 0.1$), A2 and B2 (t = -2.28, $p > 0.05$). However, no significant difference was found between B1_1 and B1_2 (t = -0.66, $p > 0.05$), B1_1and B2 (t = -0.03, $p > 0.05$), B1_2 and B2 (t = 0.54, $p > 0.05$). Other fixed factors remain insignificant: Gender (F(1, 383.9) =1.34, $p > 0.05$), Academic Genre (F(1, 387.9) = 0.05, $p > 0.05$); No significant interactions were found in this model: Proficiency Level × Gender (F(3, 377.4) = 0.68, $p > 0.05$); Proficiency Level × Academic Genre (F(3, 378.4) = 0.72, $p > 0.05$); Gender × Academic Genre (F(1, 379.6) = 0.00, $p > 0.05$); Proficiency Level × Gender × Academic Genre (F(3, 376.7) = 0.41, $p > 0.05$). For the random factor, the likelihood ratio test result ($\chi^2(1) = 16.20$, $p < 0.05$) suggested a significant effect of L1 on this dimension.

Likewise, I performed an ANOVA test on each linguistic feature on Dimension 2. The result indicated that the use of linguistic features including past tense verbs (F(3, 401) = 9.22, $p < 0.05$), perfect aspect verbs (F(3, 401) = 4.55, $p < 0.05$), present participial clauses (F(3, 401) = 3.95, $p < 0.05$), and word length (F(3, 401) = 18.04, $p < 0.05$) is statistically varied across proficiency levels. Among them, the frequency of VBD is on a steady growth as proficiency develops.

Table 3 displays dimension scores on Dimension 3. Regarding proficiency levels, students of B1_1, B1_2, and B2 were characterized by negative dimension scores except students of A2 with a slight pos-

Factors		Mean	SD	N
Proficiency	A2	0.02	1.36	65
	B1_1	-0.15	1.39	91
	B1_2	-0.17	1.49	173
	B2	-0.55	1.38	76
Academic Genre	Arts	-0.14	1.47	243
	Sciences	-0.31	1.39	162
Gender	Male	-0.09	1.50	184
	Female	-0.30	1.38	221

Table 3: Descriptive statistics for Dimension 3

itive dimension score. While the descriptive statistics suggested that dimension scores will decrease as proficiency develops on this dimension, the effect was not strong enough for it to reach statistical significance. None of the factors were significant: Proficiency Level (F(3, 388.4) = 1.21, $p > 0.05$); Gender (F(1, 386.3) = 0.21, $p > 0.05$); Academic Genre (F(1, 388.9) = 0.30, $p > 0.05$); In terms of the interaction among fixed factors, none of them was significant: Proficiency Level × Gender (F(3, 380.8) = 0.12, $p > 0.05$); Proficiency Level × Academic Genre (F(3, 381.4) = 1.18, $p > 0.05$); Gender × Academic Genre (F(1, 382.9) = 0.34, $p > 0.05$); Proficiency Level × Gender × Academic Genre (F(3, 379.9) = 0.54, $p > 0.05$). With regard to the random factor, a likelihood ratio test indicated that there is a significant effect of it ($\chi^2(1) = 17.98$, $p < 0.05$).

Factors		Mean	SD	N
Proficiency	A2	-0.12	3.18	65
	B1_1	0.66	2.96	91
	B1_2	1.65	3.14	173
	B2	1.28	2.57	76
Academic Genre	Arts	-1.29	2.93	243
	Sciences	0.75	3.24	162
Gender	Male	0.95	3.25	184
	Female	1.18	2.92	221

Table 4: Descriptive statistics for Dimension 4

Table 4 shows that except students with proficiency level A2, students with other proficiency levels, students of both academic genres and genders have negative scores on Dimension 4. All fixed factors and their interactions were not significant: Proficiency Level (F(3, 386.4) = 1.35, $p > 0.05$); Gender (F(1, 384.0) = 0.79, $p > 0.05$); Academic Genre (F(1,386.8) = 0.65, $p > 0.05$). In terms of the interaction effects, Proficiency Level × Gender (F(3, 380.0) = 0.79, $p > 0.05$); Proficiency Level × Academic Genre (F(3, 380.8) = 0.64, $p > 0.05$); Gender × Academic Genre (F(1, 381.3) = 0.01, $p > 0.05$); Proficiency Level × Gender × Academic Genre (F(3, 379.7) = 1.19, $p > 0.05$). With respect to the random factor L1, the likelihood ratio test showed a significance of it ($\chi^2(1) = 36.45$, $p < 0.05$).

Factors		Mean	SD	N
Proficiency	A2	-2.84	1.33	65
	B1_1	-2.46	1.47	91
	B1_2	-1.73	2.12	173
	B2	-2.13	1.70	76
Academic Genre	Arts	-2.06	1.90	243
	Sciences	-2.28	1.76	162
Gender	Male	-2.00	1.95	184
	Female	-2.27	1.74	221

Table 5: Descriptive statistics for Dimension 5

Table 5 displays negative dimension scores across proficiency levels, academic genres, and genders on Dimension 5. Again, the LMM revealed no significance of all the fixed factors: Proficiency Level (F(3, 385.0) = 2.02, $p > 0.05$), Gender (F(1, 382.6) = 1.19, $p > 0.05$); Academic Genre (F(1, 385.0) = 1.25, $p > 0.05$). As for the interaction among the fixed factors, Proficiency Level × Gender (F(3, 379.6) = 0.53, $p > 0.05$); Proficiency Level × Academic Genre (F(3, 379.6) = 1.33), $p > 0.05$); Gender × Academic Genre (F(1, 380.5) = 0.03, $p > 0.05$); Proficiency Level × Gender × Academic Genre (F(3, 379.6) = 1.33, $p > 0.05$). For the random factor L1, a likelihood ratio test showed a significance of it ($\chi^2(1) = 90.04$, $p < 0.05$).

Table 6 displays negative dimension scores across proficiency levels, academic genres, and genders on Dimension 6. The model revealed two significant fixed factors: Proficiency Level (F(3, 385.5) = 4.70, $p < 0.05$); Academic Genre (F(1, 385.7) = 5.48, $p < 0.05$). The Tukey post hoc analysis showed that there are significant differences between A2 and B1_2 (t = -3.30, $p < 0.05$), as well as between A2 and B2 (t = -3.30, $p < 0.05$). No significance was reported between other proficiency levels: A2 and

Factors		Mean	SD	N
Proficiency	A2	-2.09	1.26	65
	B1_1	-1.58	1.11	91
	B1_2	-1.06	1.42	173
	B2	-1.20	1.15	76
Academic Genre	Arts	-1.20	1.37	243
	Sciences	-1.61	1.236	162
Gender	Male	-1.40	1.33	184
	Female	-1.34	1.33	221

Table 6: Descriptive statistics for Dimension 6

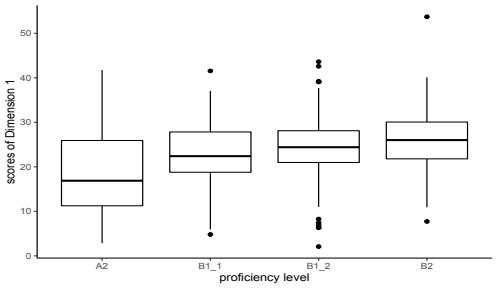

Figure 1: Dimension 1 scores across proficiency levels

B1_1 (t = -1.92, $p > 0.05$); B1_1 and B1_2 (t = -1.29, $p > 0.05$); B1_1 and B2 (t = -1.70, $p > 0.05$); B1_2 and B2 (t = -0.79, $p > 0.05$). Students of Arts and students of Sciences differed statistically (t = 2.21, $p < 0.05$). Gender was not significant on this dimension (F(1, 382.9) = 0.12, $p > 0.05$). In terms of the interaction among fixed factors, Proficiency Level × Gender (F(3, 378.9) = 0.54, $p > 0.05$); Proficiency Level × Academic Genre (F(3, 379.9) = 0.08, $p > 0.05$); Gender × Academic Genre (F(1, 380.2) = 0.38, $p > 0.05$); Proficiency Level × Gender × Academic Genre (F(3, 378.9) = 0.54, $p > 0.05$). The likelihood ratio test found a significance of the random factor L1 ($\chi^2(1) = 67.63$, $p < 0.05$).

Regarding specific linguistic features, participants differ statistically in linguistic features such as THAT clauses as verb complements (F(3, 401) = 10.51, $p < 0.05$), demonstratives (F(3, 401) = 6.41, $p < 0.05$), THAT relative clauses on object positions (F(3, 401) = 7.25, $p < 0.05$), and existential THERE (F(3, 401) = 3.63, $p < 0.05$). A positive correlation between the frequency of demonstratives and proficiency was revealed.

5 Discussion

The present study examined the effects of proficiency, academic genre and gender on the speaking style of learner speech in the framework of MDA. The six LMMs models revealed that proficiency level and academic genre can change one's speaking style to some degree.

On Dimension 1, Involved versus Informational Production. Generally speaking, the learner speech is marked by the positive pole of this dimension. In line with Kim and Nam's (2019) study, a significance of proficiency was reported in the current study in oral mode. As shown in Figure 1, the continual increase of dimension scores as proficiency develops suggested that high-proficient learners tend to be more involved than low-proficient learners in a dialogue. One of the possible explanations to this discrepancy is that advanced learners are more capable of producing contextualized grammatically correct sentences (Thompson, 2014). The fact that some linguistic features on Dimension 1 have a positive correlation with proficiency levels, such as private verbs, might be accounted by the relative difficulties of these features. Here is an evident example of speech produced by a learner with proficiency B2, which has a high density of private verbs (Extract 1). Private verbs (e.g., *think, guess* in Extract 1) are used for the overt expression of private attitudes, thoughts, and emotions, marking involved production (Biber, 1988).

Extract 1: I **guess** never. Yeah, I **think** the park used to always filled with the child – children and, uh, they will play the baseball or soccers in here and I **think** if I go to the park, it will like, uh, um, how to say, it, um – I will – I maybe will stop their activity. (ST_SD_CHN_EN_020_B2_0)

Despite the fact that word length marks informational discourse on the negative pole of Dimension 1, the result showed a steady increase of word length before learners develop into proficiency level B2, which contradicted the result in a macro manner. This surprising result informed us that dimension scores generated from the MDA is an overall description of textual style, and caution should be taken when drawing conclusions like linguistic features relevant to certain dimensions are easy to acquire. That is also the reason why there is sufficient

warrant to take a closer look at the linguistic features to find out those making a real difference in the statistical analysis. Considering that this dimension is also a fundamental parameter that indicates the opposition between oral and literate discourse (Biber, 1988), the results in this study ran counter to Biber et al.'s (2016) study . In his study, learners with higher proficiency tend to use more of the 'literate' features associated with Dimension 1 both in speaking and writing. However, in the current study, it was found that advanced learners are better at producing contextual discourse than less advanced learners do. Therefore, further studies are required to interpret the discrepancy.

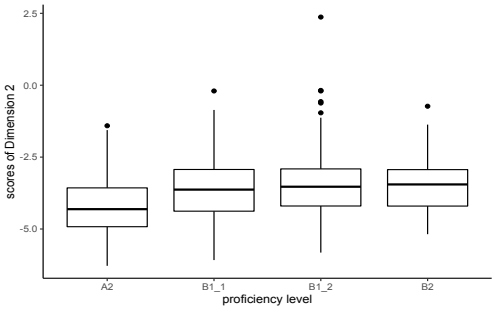

Figure 2: Dimension 2 scores across proficiency levels

In terms of Dimension 2, Narrative versus Non-Narrative. The learner speech is characterized by the negative pole as a result of the topics selected in this corpus and the intrinsic characteristics of interviews which require participants to actively express their opinion. However, the fact that there are still two picture descriptions part in the interview aiming to test participants' narrative skill explains the significant difference among students of different proficiency levels. The score of Dimension 2 reached the lowest in terms of proficiency A2 (Figure 2), which explains the frequent occurrences of attributive adjectives and present tense verbs in the speech produced by proficiency A2. As Extract 2 shows, adjectives like *social, environmental, international* are attributive adjectives and *joining* is a demonstration of the use of present tense.

Extract 2: Uhm – yeah, **social** problem and also **environmental** problem. Uhm, to improve my speaking ability especially in English, I **am joining** some international program and also **joining** some **international** committee that my faculty have. So, I hope it can increase my English quality. (ST_SD_IDN_EN_029_A2_0)

The observed increase in dimension scores as proficiency develops suggested that relevant linguistic features including present tense verbs and attributive adjectives may be grasped with ease by learners. The fact that significant difference only exists between A2 and other proficiency levels suggested that linguistic features including past tense and perfect aspect verbs may be acquired soon after proficiency A2. However, this result is not in line with the result in Kim and Nam's (2019) study. Proficiency does not significantly affect the score of Dimension 2 in learner writing in their study. They attributed the insignificance of proficiency on Dimension 2 to the genre-specific characteristics of argumentative writing or the relative ease of acquiring the relevant linguistic features. With reference to the explanations provided in their study, if the effects of proficiency work in the same way in speaking and writing, it indicated that advanced learners have a better performance in speaking in terms of narrative skill with constraints of time. In other words, the narrative skill in speaking can be more difficult for learners to acquire than in writing.

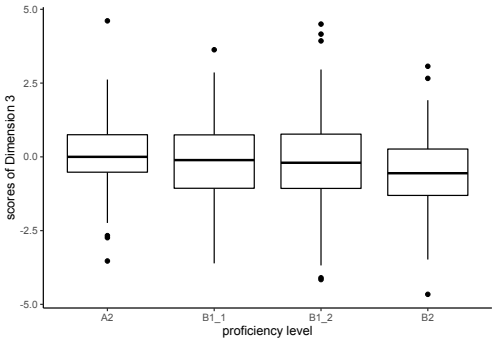

Figure 3: Dimension 3 scores across proficiency levels

With respect to Dimension 3 (Figure 3), Context-Independent Discourse versus Context-Dependent Discourse. None of the fixed factors manifested significant main effects in learner speech which is characterized by the negative pole except speech produced by learners of proficiency A2 with a slight positive value (M = 0.02). It may be explained by the relative ease of acquiring linguistic features including time adverbials, place adverbials, and other adverbs.

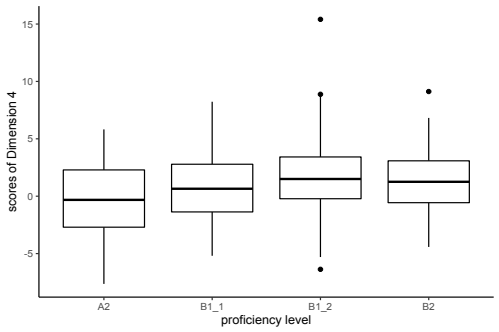

Figure 4: Dimension 4 scores across proficiency levels

On Dimension 4 (Figure 4), Overt Expression of Persuasion. The fact that no significant difference across proficiency levels on Dimension 4 was reported can be attributed to the relative ease of acquiring linguistic features relevant to persuasion.

On Dimension 5, Abstract versus Non-Abstract Information. The speech is characterized by the negative pole (Figure 5). This may be attributed to the nature of interview which requires the participants to convey information in a way that is easy to understand or the ease of achieving lexical variety, although high lexical variety is usually associated with high proficiency.

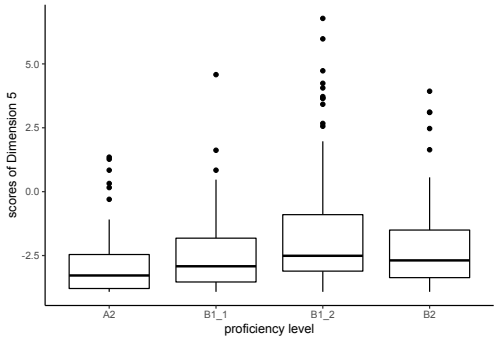

Figure 5: Dimension 5 scores across proficiency levels

On Dimension 6, Online Informational Elaboration. Despite the fact that dimension scores across proficiency levels were not linear, there is a tendency that the ability to elaborate information strengthens as proficiency develops. Learner speech across proficiency levels is unanimously characterized by negative poles (Figure 6) even though the speech was produced under strict real-time conditions, which can be taken as evidence of difficulties of acquiring

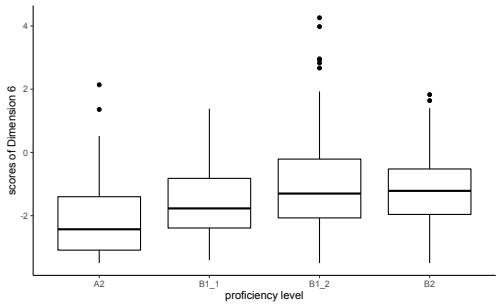

Figure 6: Dimension 6 scores across proficiency levels

linguistic features relevant to online informational elaboration, such as *that* complements to verbs, *that* complements to adjectives, and *that* relative clauses on object positions. Opposed to these linguistic features, phrasal coordination is a salient negative linguistic feature on this factor. Here is an example of A2 learners with a relatively low score on this dimension. We can see phrasal coordination are prevalent in Extract 3 like *beach and sea, surfing and swimming*.

Extract 3: "So, he can – he can go – he can go to the – uh, go to the **beach and sea** – beach sea, uh, **beach and sea** to **surfing and swimming**." (SD_TWN_EN_048_A2_0)

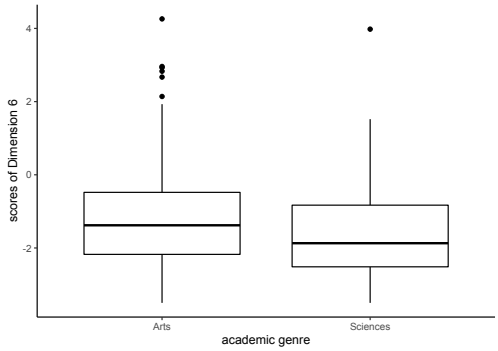

Figure 7: Dimension 6 scores across academic genres

Additionally, compared with students of Arts, students of Sciences have a lower score on this dimension (Figure 7), which indicated that students of Arts are better at elaborating information under strict real-time condition. This result could be possibly ascribed to the different language strategies adopted by students from different academic genres. Therefore, teachers who teach students of Sciences and Engi-

neering are suggested to pay extra attention to the practice of elaboration in strict real time.

6 Conclusion

In this study, proficiency and academic genre are proved to have significant effects on Dimension 1, Dimension 2 and Dimension 6 in learner speech. To sum up, speech produced by learners with higher proficiency is inclined to be more involved, more narrative and have more informational elaboration. These results indicated a need to treat students with various proficiency differently in teaching and content developing. Although many interesting findings about the effects of proficiency and other factors concerning the style of learner speech have been obtained, there remains much to be improved in the current study. First, the corpus used in the study only focuses on 10 countries and regions. It is possible that these results may not be generalizable to a broader range of learners. Second, due to a small sample size of NS speech in the corpus, a contrastive study between learner speech and NS speech is not available in this study. Further studies can tackle this issue by enlarging the number of NS speech. Third, the linguistic features used in this study are predominantly grammatical. Research endeavors involving semantic linguistic features are desired in order to have a better understanding of learner speech. Finally, task types were not taken into account in this study owing to the requirements of an effective quantitative analysis. Further studies can include task types to investigate whether there is an interaction effect between task types and proficiency levels. Nevertheless, this study has enriched the scope of MDA in learner speech and the findings are informative for future research and language teaching.

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