MEASURING GRAMMATICAL COMPLEXITY IN TEST-BASED SPOKEN DISCOURSE

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Abstract

Grammatical complexity is one of the important criteria to judge whether or not a language learner is proficient' in a particular language. However, grammatical complexity in spoken language is still under-investigated, mainly due to its unreliable operationalization in previous studies. This article discusses this challenge and its effect and argues for an alternative practice to select grammatical complexity measures for test-based spoken discourse. The article starts with a review of literature on grammar in spoken discourse and role of grammatical complexity in test-based spoken discourse. Then selections of grammatical complexity measures in previous studies are discussed. This leads to an argument for a corpus-based approach to obtaining more appropriate measures of grammatical complexity in spoken discourse.

Introduction

"Grammar lies in the heart of language" (Rimmer, 2006: 515). Grammar in spoken language may not be very important for many language speakers when using English for general communicative purposes. However, when it comes to speaking in test-based contexts, grammar plays a major role. Speaker's oral

language ability is generally judged through their abilities to use grammatical structures to convey meaning effectively.

Grammatical complexity is one of the key indicators of test-takers' speaking ability. Many renowned standardized tests (e.g., TOEFL iBT, TOEIC, and IELTS) use complexity of language as one criterion in their scoring rubrics. However, investigations of grammatical complexity in spoken discourse are scarce due to many challenges such as transcription and annotation (i.e. Granger, Hung, & Petch-Tyson, 2002; Hasselgreen, 2002) as well as unreliable measures used for grammatical complexity (Biber, Gray, & Poonpon, 2011; Norrby & Håkansson, 2007). Thus, it is expected that the review of literature on measures for grammatical complexity in previous studies in combination with considering other reliable linguistic resources can guide researchers in employing appropriate measures for grammatical complexity.

Grammar in Spoken Discourse

Since writing and speaking skills are different from each other, grammar in spoken and written discourse is not the same. Grammar in writing is likely to be more complex than that in speaking because writers have more time to plan, write, and edit their writing (Bygate, 2002; Norrby & Håkansson, 2007). Conversely, speech is described linguistically as spoken grammar (McCarthy & Carter, 2001). The speaker usually produces language in an online process with limited time to plan, speak, and edit his/her speech. Thus, he/she is likely to produce incomplete sentences or chunks of language.

Within the spoken discourse, grammar is characterized differently when the speaker produces different kinds of speech. In conversation or unplanned speech, when the speaker is trying to communicate with the listener, he/she expresses his/her ideas by using short phrases and clauses connected with *and, or, but*

or *that* which contain more embedded clauses and phrases than complete sentences (Biber, Johansson, Leech, Conrad, & Finnegan, 1999; Burns & Seidlhofer, 2002; Bygate, 2002; McCarthy, 1998). Idea units or clauses that are independent from each other are normally the key structures of his/her communication (Burns & Seidlhofer, 2002). Moreover, ellipsis can occur regularly as the speaker and the listener experience the same temporal context ("here and now") which allows them to easily cooperate and share reference of messages. They communicate in spoken units with a coherent line to maintain the conversation or to reach the goals of communication.

Grammar in planned speech, on the other hand, is more complex. The speaker has had time to prepare, edit, and even rehearse his/her speech, so idea units are not likely to play a great role here. Instead, complex grammatical features are required. Although the speaker has time to prepare and rehearse his/her speech, it is not often that the speaker can produce a speech as it was prepared and rehearsed. Simple and common vocabulary appears to be used in order to maintain the flow of speech. In this case, hesitation markers such as *well* or *you know* are common in the spoken discourse. Speaking, therefore, is sometimes claimed to be lexically driven rather than syntactically driven.

Grammar in Test-based Spoken Discourse

Production of speech, either unplanned or planned, requires different degrees of the speaker's speaking abilities (Bygate, 2002). When the speaker produces the language, especially in a test situation, his/her performance is mainly related to fluency and form (Burns & Seidlhofer, 2002; McCarthy & O'Keeffe, 2004; Robinson, 2001; Skehan & Foster, 2001) (see Figure 1). Language fluency can be explained by a proposal of a focus on meaning when the speaker produces his/her speech. A

focus on form, conversely, is more complicated because it allows both a concern for grammatical accuracy and complexity. Accuracy reflects a degree of controlled speech production processes that the speaker tries to use in a conversation. Complexity is relevant to the speaker's willingness to use more challenging and difficult language structures.
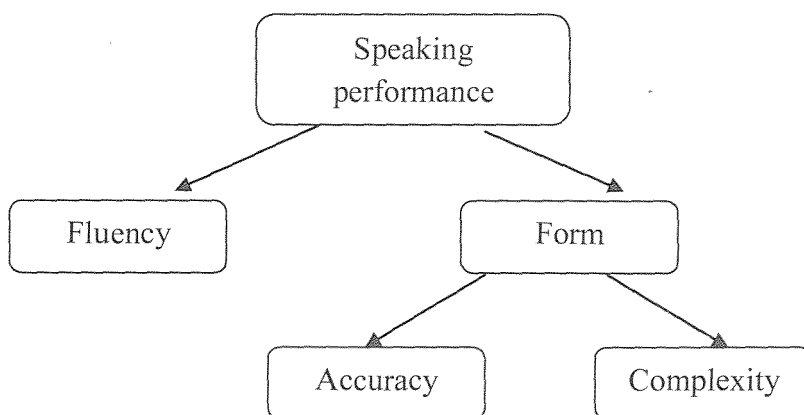
Figure 1: Speaking performance dimensions

Grammatical complexity plays an important role in distinguishing between speakers of different language abilities. To illustrate this, many proficiency tests include grammatical complexity as one criterion in their speaking scoring rubrics. The TOEFL iBT's independent speaking rubric, for example, has shown the following description for the highest score band:

> "The response demonstrates good control of basic and complex grammatical structures that allow for coherent, efficient (automatic) expression of relevant ideas. Contains generally effective word choice. Though some minor (or systematic) errors or imprecise use may be noticeable, they do not require listener effort (or obscure meaning)." (Educational Testing Service, 2008)

Test takers who get high scores from such speaking tests are those who are likely to use elaborated or difficult language structures to convey meaning effectively (e.g., Foster and Skehan, 1996; Iwashita, Brown, McNamara, & O'Hagen, 2007).

Although grammatical complexity has been considered a predictive factor of speaking ability, its operationalization is still vague (Rimmer, 2006). It is difficult to define what grammatical features are complicated in spoken discourse. Also it is sometimes hard for some test scorers and researchers to perceive and treat grammar independently from vocabulary in oral language. This is probably due to the fact that "grammatical structures often occur with restricted lexical classes because both the structures and the lexical classes serve the same underlying communicative tasks or functions" (Biber et al., 1999, p. 13). Thus, reviewing measures used to assess grammatical complexity in test-based spoken discourse in previous studies should shed light on these challenges.

Measuring Complexity in Test-based Spoken Discourse in Previous Studies

A number of studies relating to grammatical complexity in *spoken* discourse applied measures typically used in research on complexity in *written* discourse to examine complexity in oral language. Despite the fact that features regarded as indicators of grammatical complexity in spoken discourse have been underdeveloped, the application of writing complexity measures to investigating oral language complexity has been argued against for not being valid.

For instance, in a study of oral proficiency in TOEFL iBT test takers' speech (Iwashita et al., 2007), grammatical complexity was investigated by employing measures adopted from studies of grammatical complexity in both written and spoken language (e.g., Ortega, 1999, 2003; Skehan & Foster,

1999; Wolfe-Quintero, Inagaki, & Kim, 1998). Among the measures used to assess grammatical complexity--T-unit complexity ratio, dependent clause ratio, verb-phrase ratio, and mean length of utterance--only verb-phrase ratio and mean length of utterances showed significant differences across proficiency levels. It is interesting to note here that the measures that were found insignificant (i.e., T-unit complexity ratio and dependent clause ratio) were adopted from complexity studies of written discourse.

Another investigation of linguistic complexity and morpho-syntactic development in L2 adult learners also used subordination or dependent clauses as one measure of complexity (Norrby & Håkansson, 2007). In this longitudinal study, however, the measure of subordination was adopted from previous spoken discourse research. The study found that subordination was proved to be able to capture the level of language complexity. This finding supports Foster and Skehan's study (1996) on L2 oral performance, illustrating that the amount of subordination (i.e., total number of separate clauses divided by the total number of c-units) can be used to measure L2 learners' oral grammatical complexity. These two studies address the importance of selection of complexity measures for spoken discourse research. Before adopting any complexity measures, what should be considered is whether the particular measures are appropriate for a study's context in terms of differences in genres. One should be cautious when interpreting the data, as occurrences of grammatical features in spoken language are different from those in written language.

It is also noticeable in some previous research of grammatical complexity that many of the measures were based on calculations of T-units or clausal level of language (e.g., mean length of clause, mean number of clauses per T-Unit, mean number of dependent clauses per clause) and usually used in

studies of advanced learners. Such measures should be adopted with caution for investigations focusing on lower-level students who tend to produce language at the phrasal level rather than the clausal (Rimmer, 2006). In line with this notion, Biber, Gray and Poonpon (2011) have argued against the use of T-units as an absolute complexity measure. Based on the analysis of 41 research articles and 48 conversations, they proposed non-clausal features embedded in noun phrases to account for the complexities of advanced writing and conversation.

A Corpus-based Approach for Measuring Grammatical Complexity

In addition to conventionally basing a selection of measures on findings of previous grammatical complexity research, it is reasonable to look at how language is naturally used by speakers *before* determining linguistic features that are likely to contribute to grammatical complexity in speech. At this point, a corpus-based approach comes into play.

The idea of natural language use is well supported by empirically-derived grammar evidence in the *Longman Grammar of Spoken and Written English* (LGSWE; Biber et al., 1999). Based on an analysis of a corpus of over 40 million words, the LGSWE has illustrated that occurrences of grammatical features in spoken language (i.e., face-to-face communication and lecture) are different from those in written discourse (i.e., academic prose, newspaper language, and fiction). With regard to complexity, a number of complex and sophisticated grammatical constructions (i.e., complement clauses and adverbial clauses) are found to be more common in spoken language than in written genres. In addition, relative clauses and prepositional phrases occur more frequently in the written language than in the spoken one.

However, grammatical features used in spoken discourse are likely to be less complicated (Bygate, 2002; Norrby &

Håkansson, 2007). This can be explained by the fact that the speaker usually produces language in a prompt process, so he/she seems to express their ideas by using short phrases and clauses containing more embedded clauses and phrases than complete sentences (Biber et al., 1999; Burns & Seidlhofer, 2002; Bygate, 2002; McCarthy, 1998).

From this perspective, it can be hypothesized that if the speakers can use the more complex structures that are common in written language (i.e., relative clauses and prepositional phrases), this would show their ability to construct a higher-level of complex grammatical features (Biber et al., 2011). As shown in Lennon's (1990) longitudinal study of the development of non-native English learners' oral performance over 23 weeks, his participants did not show the use of complex structures, such as relative clauses and prepositional phrases, in their speech when they first started their study life in Britain. However, when comparing their interview transcripts in weeks 19-23 with those for weeks 1-17, the use of relative clauses and prepositional phrases per T-unit significantly increased. This improvement was correlated to their English proficiency. The complex grammatical structures found in Lennon's study correspond well with evidence from previous studies (Foster & Skenhan, 1996; Norrby & Håkansson, 2007), informing us that subordination is a good measure of grammatical complexity for oral discourse. Taking this evidence into account, the complex grammatical features that are common in both spoken and written language are likely to test the above mentioned hypothesis for grammatical complexity (Biber et al., 2011). In particular, investigating two common complex structures in spoken language (i.e. complement clauses and adverbial clauses) and two from written language (i.e. relative clauses and prepositional phrases) should crystallize grammatical complexity in oral discourse.

Testing this hypothesis, Poonpon's study (2009) investigated the use of complement clauses, adverbial clauses, relative clauses, and prepositional clauses in a corpus of 119 TOEFL iBT speaking responses. This empirical study found that prepositional phrases and relative clauses represented significant predictors of high-level complexity. Usually these two structures occur more frequently in written language than in spoken language (Biber et al., 1999); and grammatical features used in written language are likely to be more complex (Bygate, 2002; Norrby & Håkansson, 2007). In particular, Biber et al. (2011) have argued that prepositional phrases and relative clauses function as constituents in noun phrases. Occurrences of these two structures thus signify complex noun phrases (i.e., non-clausal features embedded in noun phrases); these embedded phrasal features represent a higher degree of production complexity. When the speakers used more complex structures that are common in written language, this showed their ability to construct a higher-level of complex grammatical features (Biber et al., 2011). In other words, higher-level speakers are likely to use more complex structures in their oral language than lower-level speakers (Lennon, 1990). The finding of the study supports this theoretical position because the use of prepositional phrases and relative clauses was found to distinguish among examinees with high and low proficiency. The findings also promote subordinated clauses (Biber et al., 2011; Foster & Skenhan, 1996; Norrby & Håkansson, 2007), particularly dependent clauses functioning as constituents in a noun phrase, and phrasal dependent structures functioning as constituents in noun phrases (Biber et al., 2011; Rimmer, 2008) as plausible measures of grammatical complexity in oral discourse. These complexity measures allow researchers to capture complex structures at non-clausal levels.

Another means to use a corpus-based approach to operationalizing grammatical complexity is related to a data-driven analysis. This method is not theoretically motivated but rather empirically motivated. Rather than selecting grammatical categories *a priori*, grammatical complexity can be examined by counting occurrences of salient grammatical features in combination with a qualitative interpretation of the data. An investigation of salient lexico-grammatical features occurring in a corpus of non-native examinees' oral monologues used a data-driven approach to find predictive lexico-grammatical measures (Poonpon, 2011). Based on factor analysis, the study revealed that the most salient sets of the features that worked well together in the spoken responses included those that represented "sentence complexity" (e.g., communication verbs, mental verbs), "supplement of information" (e.g., general adverbs), and "reference to things or persons" (e.g., concrete nouns). It is interesting to see that significant features of complexity are at word level. This finding well supports Rimmer's notion (2006) in that measures of complexity should be applicable to different ability levels of L2 speakers. In other words, a data-driven analysis allows the researcher to include lower-proficiency students who are likely to produce short language at word or phrasal levels. Therefore, this study illustrates an alternative method to find grammatical complexity measures for test-based spoken discourse.

Conclusion

This paper reviews literature on grammatical complexity in test-based spoken discourse in order to shed light on how grammatical complexity has been operationalized in previous studies and to propose an application of a corpus-based approach for operationalizaiton. While many previous studies relied on quantitative measurement of complexity based on T-

units or clausal level of language, a number of them have revealed that grammatical characteristics associated with both embedded clauses (e.g., relative clauses) and complex noun and prepositional phrases are more appropriate measures of grammatical complexity in spoken discourse. This paper argues for the application of a corpus-based approach, both theoretically and empirically motivated, as a possible avenue for assessing grammatical complexity in spoken discourse. Such an approach allows researchers not only to work on empirical data, but also to include analyses of grammatical complexity produced by speakers with different ability levels.

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