

Interlanguage Talk: What Can Breadth of Knowledge Features Tell Us about Input and Output Differences?

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Abstract

The purpose of this study is to investigate the use of breadth of knowledge lexical features in non native speakers' (NNS) input and output. Our primary interest is analyzing potential breadth of knowledge lexical differences in the output of NNSs when engaged in interlanguage talk (NNS NNS) and when engaged in naturalistic speech with a native speaker (NS). We are also interested in input differences for NNSs when engaged in interlanguage talk and when speaking with NSs. To analyze these potential differences, we compare the linguistic features in spoken corpora taken from three dyads (NS NNS, NNS NS, NNS NNS) using the computational tool Coh Metrix. Our goal is to examine if lexical production differs as a function of interlocutor and examine if the findings have indications for interlanguage development. The results indicate that NNSs produce significantly greater lexical diversity and higher word frequency (i.e., more common words) in interlanguage dyads than in NNS NS dyads. No significant differences in available NNS input were found between NS NNS and NNS NNS dyads. These findings have important implications for the developmental role of interlanguage speech in lexical acquisition.

Introduction

An important element of interlanguage development is interlanguage talk (Long & Porter, 1985). Interlanguage talk is defined as conversation between two non-native speakers (NNS). Interlanguage talk is especially important in English as a foreign language (EFL) settings where NNS do not have access to native speakers of a language with which to practice their speaking skills and develop their interlanguage competence in a natural setting. Thus, in many circumstances, NNS generally need to rely on one another to practice their language skills and develop their interlanguage. Interlanguage talk is also important in instructional settings where NNSs may only have limited opportunities to interact with native speaking English teachers. Opportunities in instructional settings are limited because of the confines of the classroom in which time is limited and the attention of the teacher is spread globally around the class and not locally on the NNS student. Interlanguage talk is thus a crucial element for providing NNSs with opportunities to practice their speaking skills

and develop their second language (L2) in the absence of native speakers (NS).

The purpose of this study is to investigate the use of breadth of knowledge lexical features in NNS dyadic speech. Breadth of knowledge lexical features, such as lexical diversity and lexical frequency, measure how many words a learner knows. Our primary interest is analyzing potential breadth of knowledge differences in the output of NNSs when engaged in interlanguage talk (NNS-NNS) and when engaged in naturalistic speech with a native speaker (NNS-NS). To compare the input that NNSs receive, we are also interested in examining native speaker input to L2 learners (NS-NNS) to NNS-NNS dyads. We analyze the potential differences among the dyads using the computational tool Coh-Metrix. Our goal is to examine if lexical production and exposure differs as a function of interlocutor and discuss the implications of the findings for second language acquisition with specific focus on the roles of input and output.

Interlanguage

Interlanguage refers to the systematic knowledge that constructs a NNS's second language. An interlanguage is a functional system that differs in accuracy and fluency when compared to the language system of a native language speaker. Unlike a native language, an interlanguage is fluid, demonstrates greater variation, and most likely will never reach a stage of fluency (Gass & Selinker, 2008). Crucial determinants in the development of an interlanguage are input and output.

Input refers to the language to which the NNS is exposed. Generally, NNSs receive modified input from NSs. This modified input is in the form of "foreigner talk" or "teacher talk." Both forms of input are similar and both are simplified at the lexical, phonological, and syntactic levels to allow for greater comprehension on the part of the NNS (Gaies 1983; Hatch 1983). It is argued that at the level of input, lexical recognition plays the greatest role in comprehension. As a result, comprehensible input is thought to lead to greater lexical acquisition. This contrasts with output, which refers to the production of language on the part of the NNS. Output is argued to force the NNS to move from lexical to syntactic processing and allow NNS the opportunity to experiment with new syntactic forms by testing hypotheses about language structure. When

combined, input and output lead to interaction. Interactional theories of language learning hold that the conversational and linguistic modifications found in interactional conversation provide NNSs with the input needed to acquire language (Long, 1983a, 1983b, 1985). Interactional modifications that assist NNSs in recognizing and amending incomprehensible input have been termed negotiations (Gass & Varonis, 1989, 1994; Long, 1983a, 1983b, 1996; Pica, 1994). Negotiations occur when NNSs or NSs signal that they do not understand an utterance for lexical, phonological, morphosyntactic, or other reasons. This leads to an opportunity to negotiate for meaning and the resulting interaction allows participants to reconsider and restructure the language that caused the initial loss of meaning. The interaction that naturally occurs during the negotiation for meaning can lead to the introduction of new and varied linguistic input as well as new and varied output (Swain, 1985, 1995).

Interlanguage Talk

Key to the importance of interaction is the investigation of interlanguage talk. Interlanguage talk in the L2 classroom is pedagogically important because pairwork between NNSs increases opportunities for language practice and can lead to the development of increased interlanguage fluency (Long & Porter, 1985). For the purpose of this study, we are most interested in the latter (that interlanguage talk supports interlanguage development). This notion has been supported in various studies. For example, Porter (1983) investigated the linguistic features of speech between NNS-NNS and NNS-NS. Porter analyzed the speech of 12 NNSs and 6 NSs. The NNS participants ranged from intermediate to advanced learners of English. Porter found that NNS-NNS dyads produced more talk than NNS-NS dyads and that the NNS-NNS dyads showed no significant difference from the NNS-NS dyads in the number of grammatical and lexical errors made. Porter's findings help to demonstrate that interlanguage talk has the potential to be more productive than NNS-NS talk while not demonstrating any more errors. Additional studies have demonstrated that interlanguage talk rarely leads to the development of incorrect forms of language (Bruton & Samuda, 1980) and that interlanguage talk can lead to lexical acquisition through hypothesis generation and testing (Swain & Lampkin, 1998).

Other studies supporting the strength of interlanguage talk have not so much focused on the linguistic features of interlanguage talk, but the use of negotiations in interlanguage talk. For instance, Varonis and Gass (1983) and Gass and Varonis (1989) found that there was a greater frequency of negotiation sequences in NNS-NNS dyads than in NNS-NS dyads, especially when the learners were of different language backgrounds and different proficiency levels. In a subsequent study, Doughty and

Pica (1984) examined the language found in teacher centered lessons, pair work, and four person group work. Doughty and Pica found more negotiations in pair work than in teacher centered lessons. Together, these studies support the notion that NNS-NNS conversations produce communicative contexts in which NNSs can develop their interlanguage skills through negotiation.

Input: Frequency and Lexical Diversity

While it appears from the paucity of recent research considering interlanguage talk that such studies have lost their momentum, studies examining the attributes of input are still of mainstream importance. Many of these studies focus on the role of input, frequency, and function (Ellis & Collins, 2009). Particularly, these studies investigate how second language acquisition is affected by the distribution of linguistic features in input. The frequency of linguistic items is an important feature of phonological, syntactic, and lexical acquisition because it allows learners to develop patterns of occurrence when processing language. Lexical frequency relates to the learning of categorizations from exemplars. Categorization acquisition is aided by the introduction of low variance samples that center on prototypical examples. From a lexical diversity perspective, the more tokens there are of an exemplar in the input, the greater the contribution of the exemplar will be to the development of the prototype (Ellis & Collins, 2009).

Methods

Our purpose in this paper is to examine differences in breadth of knowledge features (lexical diversity and frequency) between dyads (NS-NNS, NNS-NS, NNS-NNS) to investigate the potential benefits or disadvantages of interlanguage talk in L2 acquisition. We are primarily interested in potential NNS input differences between NS-NNS and NNS-NNS dyads and potential NNS output differences in NNS-NS and NNS-NNS dyads. Our hypothesis is that NS-NNS dyads will provide more comprehensible input to NNSs than NNS-NNS dyads because of NS's propensity to simplify language (i.e. foreigner talk). We also hypothesize that NNSs will produce more varied and more infrequent vocabulary when speaking with NSs (NNS-NS dyad) than with NNSs (NNS-NNS dyad). To test these hypotheses, we analyze a corpus of spoken language texts using the computational tool Coh-Metrix.

Corpora

We collected a corpus of spoken language texts from both NNSs and NSs. All participants were students at a large university in the United States. The NSs and many of

Table 1

Descriptive Statistics Interlanguage Talk Corpus

Condition	Number of Texts in corpus	Number of words in corpus	Mean number of words per text
NS-NNS	100	37509	375.090
NNS-NS	106	49046	462.698
NNS-NNS	200	82473	412.345

the NNSs were students in a second language acquisition class. These students were asked to converse with an unknown NNS from a different language background that was studying English at the ESL center at the university as part of the class. All the NNSs in the study were at the intermediate or advanced levels of language proficiency as classified by TOEFL tests (in the case of the NNS students in the SLA class) or internal classification assessments (in the case of the NNS students at the ESL center). The internal classification assessment used by the ESL center was a combination of the ACT Compass ESL reading and writing tests and internal tests of listening and speaking. The NSs in the study came from a variety of regions, but were mostly from the southern region of the United States. All NS were American except for one NS from Britain. The NNSs in this study came from a variety of first language (L1) backgrounds including Arabic, Japanese, Korean, Malay, Portuguese, Sri Lankan, Thai, French, Uzbek, and Spanish. The texts were collected over a five-year time span. Descriptive statistics from the total corpus can be found in Table 1.

Coh-Metrix

Coh-Metrix (Graesser et al., 2004) is a computational tool that provides over 600 linguistic indices related to conceptual knowledge, cohesion, lexical difficulty, syntactic complexity, and simple incidence scores. Many of the measures reported by Coh-Metrix are related to lexical proficiency. The two measures we are most interested in for the purpose of this study are lexical diversity and word frequency. These measures along with the respective indices reported by Coh-Metrix are discussed below.

Lexical Diversity. The premise behind lexical diversity indices is that more diverse vocabularies are indicative of more proficient and larger lexicons. From an input perspective, a lower lexical diversity score is thought to allow for the quicker acquisition of lexical prototypes. The majority of the indices related to lexical diversity concentrate on type token ratios (TTR), which are simple formulas that divide the number of different words (types) by the total number of words (tokens) in a given text. There are various deviations of simple TTR measures such as Corrected TTR (Carroll, 1964) and Log TTR (Herdan, 1960), and Advanced TTR (Daller et al., 2003).

An important limitation of traditional LD indices is that while the number of tokens in a text will increase linearly, the relative number of types will steadily decrease. Thus, every new word is a new token at the beginning of a text, but, after a relatively short amount of text, tokens tend to be repeated. This leads the number of types to asymptote. Thus, in general, TTR results correlate highly with text length. As a result, if a corpus of texts has token counts that distinctly differ, TTR results are not reliable (McCarthy & Jarvis, 2007). To correct problems related to text length in traditional LD indices, more sophisticated approaches to measuring lexical diversity have been developed. Those reported by Coh-Metrix include *MTLD* (McCarthy, 2005) and *D* (Malvern, Richards, Chipere, & Durán, 2004). These latter indices (*D* and *MTLD*) were selected for this study. Supportive validation evidence for these LD measures as calculated by Coh-Metrix has been found in studies related to L2 lexical proficiency (Crossley, Salsbury, & McNamara, 2009; in press).

Lexical Frequency. The theoretical basis behind indices of word frequency is that they are able to measure lexical proficiency of learners with higher proficiency speakers using less frequent words. Most traditional frequency indices have depended on word frequency lists (Meara & Bell, 2001; Nation, 1988). These word frequency lists are placed in word frequency bands comprised of the first 1,000 most common words, the second 1,000 most common words, or the 1,000 most common words found in academic writing (e.g., Laufer & Nation, 1995; Nation & Heatley, 1996). As mentioned early, word frequency has traditionally been considered to be indicative of breadth of knowledge. However, some researchers argue that the production and comprehension of words is a function of their frequency of occurrence in language (e.g., Ellis, 2002). This supports a distributional model of language learning in which word frequency helps determine lexical acquisition because each repetition of a word strengthens the connections between the word and its meaning categorization.

The lexical frequency indices reported by Coh-Metrix are different from traditional indices of word frequency used in lexical studies. The Coh-Metrix indices do not depend on lexical bands and instead take frequency counts from CELEX (Baayen, Piepenbrock, & Gulikers, 1995), a database from the Centre for Lexical Information, which

Table 2

*Lexical Diversity Indices *t* Test Results.*

Comparisons	<i>D</i>		<i>MTLD</i>	
	<i>t</i> value	<i>p</i> value	<i>t</i> value	<i>p</i> value
NNS-NS to NNS-NNS	2.673	<.010	4.394	<.001
NS-NNS to NNS-NNS	1.055	>.050	0.662	>.050

Table 4

*Lexical Frequency Indices *t* Test Results.*

Comparisons	Celex written frequency		Celex spoken frequency	
	<i>t</i> value	<i>p</i> value	<i>t</i> value	<i>p</i> value
NNS-NS to NNS-NNS	4.267	<.001	3.525	<.001
NS-NNS to NNS-NNS	0.267	>.050	1.510	>.050

consists of frequencies taken from the early 1991 version of the COBUILD corpus, a 17.9 million-word corpus.

When calculating word frequency, Coh-Metrix computes the mean logarithm of the word frequency for all the words in the text that are also found in the COBUILD corpus. Coh-Metrix uses this data to report a variety of frequency indices. The common indices reported by Coh-Metrix calculate the frequency for content words in the text based on both spoken and written corpora. For this study, we selected two indices of word frequency: spoken content word frequency and written content word frequency. Supportive validation evidence for the word frequency measures reported by Coh-Metrix is available in past studies of lexical proficiency and lexical difficulty (Crossley, Salsbury, & McNamara, 2010). All indices of word frequency reported by Coh-Metrix control for text length by reporting normalized frequencies.

Statistical Analysis

To test differences between the dyads in their lexical diversity and frequency, we conducted a series of *t* tests using the Coh-Metrix indices as the independent variables and the dyads as the dependent variables. More sophisticated analyses were not conducted because we simply wanted to identify differences in mean scores between two independent samples.

Results

Lexical Diversity Indices

t test results demonstrate that significant differences exist between the dyads for both indices of lexical diversity. The *t* tests found in the first row of Table 2 demonstrate that there were significant differences between the NNS-NS and NNS-NNS dyads for both *D* and *MTLD*. However, no significant differences were noted between the NS-NNS and NNS-NNS dyad for either *D* or *MTLD* (see the second row of Table 2). Mean lexical diversity values from this

analysis (see Table 3) demonstrate that NNS listeners receive input with the same lexical diversity whether it comes from a NS or a NNS. However, when a NNS speaks to a NS, lexical diversity is significantly lower than when a NNS speaks to a NNS.

Table 3

Means (Standard Deviations) for Lexical diversity Indices

Dyad	<i>D</i>	<i>MTLD</i>
NS-NNS	48.690 (19.724)	40.532 (15.222)
NNS-NS	41.783 (16.014)	32.930 (13.054)
NNS-NNS	46.580 (14.333)	39.464 (12.002)

Lexical Frequency Indices

The results demonstrate that significant differences are apparent between the dyads for both indices of lexical frequency. The *t* tests found in the first row of Table 4 demonstrate that there were significant differences between the NNS-NS and NNS-NNS dyad for both spoken and written indices of lexical frequency. However, no significant differences were noted between the NS-NNS and NNS-NNS dyad for either lexical frequency index (see the second row of Table 4). Mean lexical frequency values from this analysis (see Table 5) demonstrate that NNS listeners receive input with lexical items of the same frequency whether it comes from a NS or a NNS. However, when a NNS speaks to a NS, they use words of a lower frequency than when a NNS speaks to a NNS.

Table 5

Mean (Standard Deviations) for Lexical Frequency Indices

Dyad	Celex written frequency	Celex spoken frequency
NS-NNS	2.059 (0.280)	2.027 (0.371)
NNS-NS	1.927 (0.336)	1.805 (0.479)
NNS-NNS	2.067 (0.238)	1.962 (0.479)

Discussion

This study demonstrates that NNS speakers differ in the lexical output they produce (diversity and frequency) depending on whether their interlocutor is a NS or a NNS. However, the lexical input that NNS listeners receive appears to be similar with no differences noted between NNS-NNS and NS-NNS dyads. These findings have important implications for the benefits of interlanguage talk, comprehensible input, and theories of L2 output.

One important finding is that the NNSs in this study modified their output based on the native language of the interlocutor. If the interlocutor is a NS, the NNS uses significantly less lexical diversity than if the interlocutor is another NNS. This finding demonstrates that NNSs are more likely to produce a greater range of words when speaking with another NNS than with a NS. Such a finding provides additional strength to theories supporting the use of interlanguage talk inside and outside the L2 classroom. Additionally, the study shows that if the interlocutor is a NS, NNS use significantly less frequent words than if the interlocutor is another NNS. This modification likely signifies that NNSs at the intermediate and advanced levels simplify their speech to make it more comprehensible or understandable to NNSs. Together, the output findings in this study characterize the lexical features of NNS-NNS speech as comprehensible and varied as that provided by NSs. The findings also lends credence to the notion that output does not simply move NNSs from lexical to syntactic processing, but allows NNSs to produce a variety of levels of lexical sophistication.

From an input perspective, the study demonstrates that NNSs receive no specific lexical benefits related to lexical diversity and frequency from interacting with NSs. That is to say, the lexical input that a NNS receives, whether from a NS or a NNS, is equally comprehensible in terms of depth of knowledge lexical features. Such a finding goes a long way in supporting the notion that interlanguage talk is as beneficial as NS-NNS talk. Specifically, NNSs interacting with other NNSs are just as likely to receive important distributional elements of language such as more frequent words. The frequent words found in NNS input (whether from other NNSs or NSs) likely assist in developing patterns of occurrence that are important in acquiring language specific categories.

Conclusion

Overall, this paper presents strong, new evidence for the strength of interlanguage talk. This evidence is considered in light of new theories of input that regard the distributional properties of language. The evidence reported in this paper supports the idea that NNSs receive similar lexical input from both NS and NNS interlocutors. The evidence also demonstrates that NNS output in

interlanguage talk as compared to NNS-NS talk differs in the frequency of words used and the lexical diversity of those words, with interlanguage talk consisting of a greater variety of more frequent words.

This study also raises considerable research questions that our research design does not allow us to address. For instance, while our study supports the strength of interlanguage talk in naturalistic settings, an analysis of language collected from instructional settings would be critical to extend the findings to a classroom environment. It would be especially important to collect data from NNS-NNS dyads where the learners were from the same first language. Such a study would do much to support the strength of interlanguage talk in EFL settings. Additionally, we only consider breadth of knowledge measures. Expanding this approach to include depth of knowledge measures (measures that examine how well a learner knows a word) could provide additional indications for the benefits of interlanguage talk. Stronger links between interlanguage input and output and their effects on the frequency of negotiations should also be considered. Lastly, an analysis that includes a NS-NS dyad would provide important indications to the types of modifications that NSs make when partnering with a NNS as compared to another NS.

Additional studies such as those suggested above, when combined with findings reported in this paper, would give us a fuller understanding of the strengths of interlanguage talk from both an input and an output perspective. This initial study indicates that interlanguage talk, from a lexical diversity and frequency perspective, is as beneficial as NS-NNS talk, especially with regard to the type of input available.

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