



## EFL Conversational Triads: Foreigner-directed Speech and Hyperarticulation

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### Abstract

The study examines interactions associated with foreigner-directed speech (FDS) within EFL triadic conversation exam where learners differ in outspokenness. The results showed that learners' outspokenness affected foreign examiners' vowel articulation. More vowels underwent distinct change across learners' positive-coded utterances in F2, whereas in F1 the vowel change in the high-communicative group during the introduction of a new question was the greatest source of variation. The findings suggest that native speakers tend to hyperarticulate during interactions with the low-communicate group, and probably with didactic intent to instruct or smooth communicative situations, in particular during more encouraging speech acts.

**Index Terms:** EFL, foreigner directed speech, hyperarticulation, vowel space

### 1. Introduction

This study deals with elements involving acoustic features associated with foreigner-directed speech (FDS) within an English-as-a-foreign-language (EFL) context. FDS can be thought of as a collection of acoustic features that change when a native speaker addresses a non-native speaker of that same language [2, 8].

FDS has been thought to function as a didactic device, i.e., the accommodation is thought to teach the listener something about the language that requires altering the speech signal. Also, FDS is thought to convey a speaker's emotion and therefore it is primarily an accommodation where exaggerating features of the speech signal facilitate communication. These findings, although not mutually exclusive, stem from interpretations of FDS appearing in more task-oriented studies [9, 17], its absence in conversation-oriented studies [6], and its ambiguous status in laboratory-based studies [10, 18]. The present research was motivated to model interactions associated with FDS within EFL conversation-based exam contexts, enabling a distinct and consistent setting for comparing native English speech and for understanding the factors and their interactions associated with FDS.

### 2. Related work

A number of variables seem to be involved with the expression of foreigner-directed speech [1, 3, 10, 14, 17]. These have tended to be centered on the context of the utterance eliciting measurable changes in vowel articulation, pitch, and affect when compared to adult-directed speech or other directed speeches [2, 16]. These studies conclude that, in the case of infant-directed speech (IDS), there could be a didactic device at work to explain the changes in speech

observed. This means the infant is exposed to these prosodic differences to teach, for example, a language's acoustic system [2] or a sociological, emotive system [16]. Uther et al. [17] suggest that if FDS also has a didactic component then it should appear as orthogonal to the affect component present (3). Perhaps contrary to this idea is the failure of FDS accommodation to appear in ecologically valid, conversational settings [6]. However, all of these studies were designed to examine FDS explicitly within dyads and none have studied outspoken learning behaviors as a factor in FDS.

In [2] the authors compared twelve mothers' speech to their infant, pet and an adult among three domains: pitch, a measure in hertz of the fundamental frequency; affect, a five scale rated factor; articulation of the corner vowels /a/, /i/, and /u/. The mothers were all monolingual native speakers of Australian English and recordings were made by participants within their respective homes to create as authentic an encounter as possible. Each mother was instructed to use three words, (shark, sheep, shoe), in "naturalistic 10- to 15-minute interactions with each recipient". Analyses of variance were done for pitch, affect, and hyperarticulation to examine the differences between infant-, adult-, and pet-directed speech (IDS, ADS, PDS, respectively). The infant and pet-directed speeches were statistically the same in pitch as well as of significantly higher pitch than for those observed in adult-directed speech. The authors found the F1 and F2 vowel formant space for IDS to be hyperarticulated whereas PDS and ADS were not.

The authors predicted that foreigner-directed speech (FDS) "would have hyperarticulated vowels, but little evidence of emotional aspects" (p. 1435). Indeed, this appears to be justified as [16] did find that speech to infants and foreigners share equivalently hyperarticulated F1 and F2 vowel formants yet differ in the emotional content revealed in pitch and affect. The basic design in Uther et al. was the same, but with FDS substituted for PDS. They surmised from their data that the didactic nature of IDS [11] applies to FDS as well. They reasoned both types of directed speeches are to language learners (L1 and L2) who might benefit linguistically from exposure to the extremes of the language-specific phonetic prototypes through exaggeration of pertinent phonetic contrasts. Uther and colleagues [17] temper the validity of this extension by stating any "... benefit of FDS for foreigners can only be presumed at this stage, and requires further study whether there is a linguistic benefit, and if so, its strength, nature, and the conditions under which it occurs" (p. 6). They draw two conclusions: vowel hyperarticulation is independent of affective modifications in speech production; the didactic aspect of FDS is pervasive as it occurs across many speech registers.

Uther et al.'s conclusions appear to be consistent with their data. Gafter, Jurafsky, and Sumner [6] suggest, however, that

FDS accommodation is more restricted in function, occurring in more or less task-oriented contexts [2, 15] and may not occur in casual conversation at all.

The paper focuses on how FDS realize itself in triadic conversation where learners differ in oral proficiency, specifically how a native speaker hyperarticulates utterances, under what conditions it occurs, its function or nature and potential strength.

### 3. Methodology

#### 3.1. Participants and procedure

For the purpose of examining FDS in a communicative setting that might increase the amount of FDS encountered, a triadic conversation exam was considered. This study examined the interactions between three male, native English speaking examiners and 62 native Mandarin speaking university students in southern Taiwan. The students were all English majors aged between 18 and 21, while the native English speakers' mean age was 37.3 years. All were uninformed about the nature of the research.

Two students are interviewed at a time by an examiner. A video tape of the resulting 31 triads was made and served as the data source for analysis. Each complete triad was approximately 12 minutes in length. The three-way conversation-based discussion consisted of issues pertaining to the theme of adventure. Five guiding questions containing the three corner vowels (/a/, /i/, and /u/) were devised to help keep the natural flow of conversations. The examiners were to initially familiarize themselves with these and then paraphrase these during the triad conversations.

#### 3.2. Data descriptions

The general approach taken herein for examining triadic FDS is to view the interactions of all participants as a process. This is expressed as a discrete, ordered sequence of conversation states defining the overall triads. At least one and at most two outspoken students within a triad served as the treatment group. The outspoken students refer to those who demonstrate a propensity to engage people verbally in English, referred to as the high-communicative group. This group is structured to represent the inherent qualities of triadic exchanges which relied on coalitions. The most salient feature of triads is the arrangement of participants into a coalition of two individuals against one individual. This means there are two types of coalitions that can form during the conversation exam, either between the two students or a student and the examiner. From the data, students identified as outspoken tended to form coalitions with the examiner rather than the other student present, therefore triads containing one or two outspoken students were treated homogeneously. The control group consisted of triads that had only non-outspoken students, referred to as the low-communicative group. This triadic basis for group membership status was used for Hierarchical Log-linear and Three-way ANOVA analyses.

#### 3.3. Data Coding and Analysis

In order to more closely observe under what situation the examiners hyperarticulate their utterances, the overall utterances are coded based on the following speech act categories.

Directives/Facilitating: Speaker's utterance is intended to stimulate a response, increase contextual/topical understanding

or the scope of the frame of reference [12]; utterances containing any of these are rated as positive. Defending/protesting: Speaker's utterance is intended to show dissatisfaction, as defensive or offensive [12], such utterances being rated as negative. Utterances neither positive nor negative are rated as neutral [5].

A hierarchical log-linear (HILOG) method [7] was used to support the description of the discourse patterns observed, and indicate the type of exchange in the conversation where speech act categories differed (positive, negative or neutral) most across treatment and control groups. This last part would offer an explanation for any differences found in extracted first and second formant vowel data for the Three-way ANOVA analysis. The HILOG statistical instrument consisted of the following factors: group membership – high-communicative and low-communicative groups; starter of a sequence pair – the speaker who initiated the sequence (see footnote), i.e., the examiner or student A or student B; initial comment type – the initial utterance of a sequence pair, judged as either positive, negative, or neutral; response comment type – the response utterance of a sequence pair, judged as either positive, negative, or neutral<sup>1</sup>.

The three-way ANOVA consisted of the following factors: *Group* – high-communicative and low-communicative groups; *type of event* – all the examiner's positive-coded, initial utterances, i.e., when the examiner is the starter of a sequence pair and the initial comment is positive-coded; *vowel formant* where the dependent variable was a set of formant samples (F1 and F2 were tested independently) from the examiners' collected corner vowels clustered with samples of 10 per vowel and were tested across *group* and *event* factors.

The *event* type factor was defined based on the results of the HILOG analyses. A significant difference ( $p < .05$ ) was found for all examiners in the initial comment directed to each group under investigation. It was surmised that the vowel formants for /a/, /i/, and /u/ at these junctures should offer the best chance to see interactive features of FDS and determine its functionality in triadic encounters. Note that a subset of these same utterances was resolved as being the introduction of a new question (INT) – any positive-coded, initial utterance by an examiner. In other words, only the first time a question from the exam list was announced to a particular group was it coded as INT; reprisals and redirects to the other student did not qualify. This was done to see if hyperarticulation varied within positive coded utterances in a predictable way.

## 4. Experiment and results

#### 4.1. Individual Examiner's Vowel Hyperarticulation

The results of the three examiners' corner vowels were summarized as follows (see Figure 1), with vowel space during (a) (see top graph) positive-coded utterances and (b) (see bottom graph) introduction of new questions. Because of the limited space available herein, the figures for each individual examiner had to be omitted.

Examiner A: There was a significant interaction between *group* and *formant* factors (GF:  $F = 18.352, p < .001$ ) but not between *event* and *formant* (EF:  $F = 1.01, p > .05$ ). The result indicates that the source of variation between groups at the

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<sup>1</sup> A sequence pair is terminology descriptive of ordered data in sequential analysis and is analogous to the term adjacency pair in linguistics where each utterance has an implicit order.

introduction of a new question is likely random while in the overall positive utterances it is not.

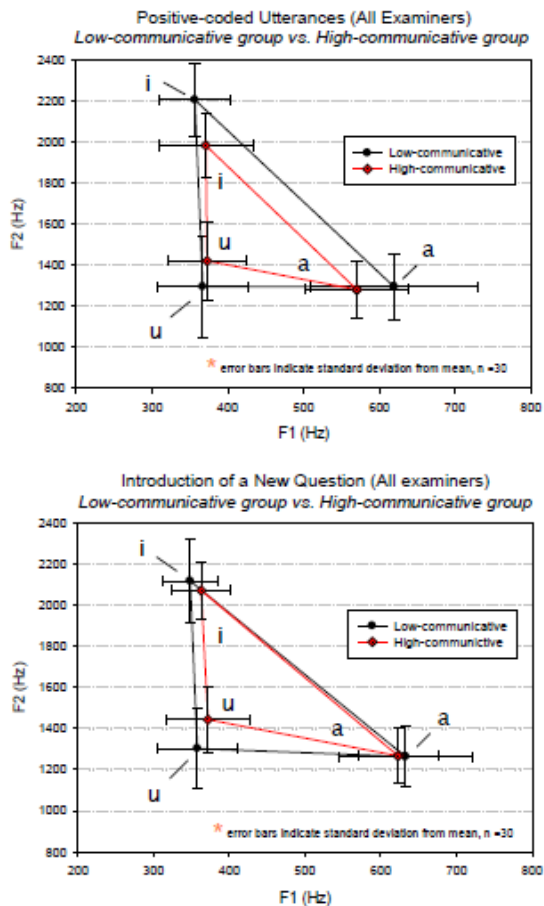


Figure 1: (a) (top graph) GEF (*group* × *event* × *formant*) vowel space: Plot of three vowels during examiners' positive-coded utterances; (b) (bottom graph) GEF vowel space: Plot of three vowels during examiners' introduction of a new question.

In A's F2, this is evidence that hyperarticulation occurs across group membership at the introduction of a new question while only the low-communicative group shows significant hyperarticulation at other positive-coded utterances.

Examiner B: An all pairwise multiple comparison (Holm-Sidak method) revealed that the *event* factor was non-significant within the low-communicative group while there was a significant difference ( $p < .001$ ) within the high-communicative group in F1, suggesting examiner B had a greater difference in mumbling here than in the low-communicative group. Furthermore, the *group* factor within all positive utterances was non-significant while within the introduction of new questions ( $p < .001$ ) it was.

The result indicates that the *group* factor is not determined by the level of introductions of new questions in F2, but is determined by the vowel formant cluster. This is further evidence that hyperarticulation occurs across group membership at the introduction of a new question while only the low-communicative group shows significant hyperarticulation within the full set of positive-coded utterances.

Examiner C: The *group* and *event* interaction (GE:  $F =$

1.085,  $p > .05$ ) and the *group* and *formant* interaction (GF:  $F = 11.64$ ,  $p < .001$ ) indicate that the level of new questions introduced doesn't determine *group* factor in F1 but *group* factor is determined by the vowel formant cluster. All pairwise multiple comparison (Holm-Sidak method) revealed *event* factor was a significant source of variation ( $p < .001$ ) within the high-communicative group, but not in the low-communicative group ( $p > .3$ ). This means that hyperarticulation occurs across group membership at the introduction of a new question while only the low-communicative group received more hyperarticulated vowels in the overall positive-coded utterances.

Again, an all pairwise multiple comparison (Holm-Sidak method) showed *group* membership within the positive utterances was a significant source of variation ( $p < .001$ ) while in the introduction of a new question it was not ( $p > .5$ ). This is clear evidence in F2, and also in F1, that hyperarticulated vowels occur within the low-communicative group's overall conversation and across group membership during the introduction of a new question.

## 4.2. Collective Examiner Vowel Hyperarticulation

The *group* and *formant* interaction (GF:  $F = 1.651$ ,  $p > .1$ ) indicated that *formant* is not a significant source of variation within F1 for the *group* factor. The *event* and *formant* (EF:  $F = 5.909$ ,  $p < .01$ , power = .813) was the only significant interaction in F1. An all pairwise multiple comparison (Holm-Sidak method) showed the vowel /a/ differed across positive utterances and introduction of a new question utterances ( $p < .001$ ). This illustrates that in F1, the hyperarticulated vowels occurred within the low-communicative group's overall conversation and the greatest source of vowel variation occurred during the introduction of a new question.

The *group* and *formant* interaction (GF:  $F = 11.509$ ,  $p < .001$ , power = .994) showed significant differences ( $p < .001$ ) for the vowels /i/ and /u/ in all pairwise multiple comparisons (Holm-Sidak method). This indicates that the *group* factor is not determined by the level of introductions of new questions in F2, but is determined by the vowel formant cluster. This is further evidence that hyperarticulation occurs across group membership at the introduction of a new question while only the low-communicative group shows significant hyperarticulation within the full set of positive-coded utterances.

In each of the examiners' F1 data, there was a tendency for the source of greatest variation to be more associated with the *event* factor (being positive, negative or neutral utterances) and in F2 the variation was strongest in the *group* factor (high vs low-communicative). This might be due to the limited range that the F1 of the vowels appeared in, 255.7 to 780.3 Hz, compared to F2, 911.9 to 2609.8 Hz. In other words, there were more vowels undergoing distinct change across group members' positive-coded utterances in F2 whereas in F1 the vowel change in the high-communicative group during the introduction of a new question was the greatest source of variation (see Figure 1, (a) and (b)).

## 5. Discussion

In general, vowel space is smaller for High-communicative groups in both types of utterances compared to the low-communicative group. In positive-coded utterances, all three examiners show much smaller vowel space for the High-communicative groups in positive-coded utterances than in introduction of new questions. In introduction of new

questions, more efforts and new clarity or focus are imposed so examiners articulate with more strength, while similar vowel space is used for the low-communicative group both in positive-coded utterances and introduction of new questions since the low-communicative group has all along received more articulated strength to enhance and assist their comprehension.

During utterances involving introducing new questions, the low-communicative group show similar trends as the High-communicative groups since examiners tend to exercise larger vowel space than in positive-coded utterances, despite some variations. For the low-communicative group, two examiners employed larger vowel space than during positive-coded utterances, examiner A with slightly larger vowel space for introduction of new questions, examiner B with much larger vowel space in introduction of new questions, while examiner C with slightly smaller vowel space than during positive-coded utterances. It appears that there exist larger vowel space differences between the two types of utterances for High-communicative groups than those for low-communicative group.

Overall, the results show that perhaps hyperarticulated vowel features are directed towards low-communicative group to accommodate to their comprehension needs and provide clearer phonetic contrasts, realizing as at least a mild didactic hint towards the learners during the triad conversational examination, hence corresponding with the findings in [17] that foreigner-directed speech (FDS) show hyperarticulated F1 and F2 vowel formants, as in infant-directed speech. Further, the data here shows that when interacting with the high-communicative group, examiners tend to use more conversational style vowels, less clear and perhaps quicker, congruent with previous studies [4, 12]. Therefore, outspokenness does have an effect on native speakers when encountering nonnative speakers' speech, especially during more positive speech acts.

## 6. Conclusions and future work

The present study presented FDS' realizations in a triadic conversation-based exam setting where learners show different propensity in speech performance. The results confirm that native speakers tend to hyperarticulate during interactions with the low-communicate group, and probably with didactic intent to instruct or smooth communicative situations, in particular during more encouraging speech acts. Future work is in progress and will centre on detailed exploration between sequential interactions of examiner, learner group, and their corresponding categories of speech acts, as interlocutors' attitudes or expressions may affect their group member or examiner's speech behaviour and contribute to overall communicative success. This study has implications in teaching classroom conversations and in modeling conversational hyperarticulation during speech acts or problem-solving during question-answer sequences in cross-cultural settings.

## 7. References

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