THE EFFECTS OF TEACHER TALK ON L2 LEARNERS'

COMPREHENSION

by

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ABSTRACT

In the field of the second language acquisition, a number of studies have investigated the phenomenon of linguistic input to L2 learners in order to determine its role in the process of acquiring a target language. In classroom settings, such input is provided by the L2 teacher speech to nonnative speakers of the second language. Research indicates that teacher talk (TT) directed to L2 learners is characterized by discourse, syntactic, lexical, and phonological modifications. However, only a few studies provide evidence about the effects of TT phonetic/phonological adjustments on the nonnative comprehension.

In the present study, nonnative listeners participated in an auditory sentence-final keyword transcription task for teacher talk and conversational speech. Results revealed that NNSs exhibited a significant main effect of speech type, with teacher talk more intelligible than conversational speech. However, the pattern of results in this study showed that the magnitude of speech type benefit differs depending on different levels of various factors such as level of learner proficiency, talker, and sentential context. The results from this study are interpreted in terms of their implications for providing comprehensible input to L2 learners in order to assist their language acquisition.

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

Over the last few decades, inspired by a large number of studies investigating the role of the linguistic environment in first language (L1) acquisition, researchers have directed their attention to the external linguistic factors that offer assistance to second language (L2) learners in acquiring a target language. The phenomenon of linguistic input to L2 learners has been investigated in order to determine whether speech addressed to nonnative speakers (NNSs), both children and adults, differs from language that adult native speakers (NSs) use in NS–NS conversations, and if so, whether these differences facilitate L2 learners' comprehension and/or acquisition of the target language. The present study is an attempt to elucidate further the nature of a particular type of input to learners, namely teacher talk targeted to NNSs, and its relationship to second language learner comprehension.

CHAPTER 2

LITERATURE REVIEW

2.1 Input and Second Language Acquisition

In order to understand the role of input in the formal context of teaching and

learning, it is first necessary to examine the relationship between input and second

language acquisition (SLA). The following discussion reviews two major lines of

research on the role of input in SLA.

2.1.1 Quantity of Input and SLA

In the first major line of inquiry, researchers have investigated the relationship

between the quantity of input to learners and various measures of second language

proficiency. Studies concerned in particular with the *quantity* of input (e.g., Bialystok,

1978; Seliger, 1977) have provided evidence for the hypothesis that learners who have

the opportunity to receive the most target language (TL) input are those who exhibit

greater proficiency. For example, Seliger (1977) found that L2 learners who were able to

generate significantly more input from sources in and outside of the classroom

environment (called "high-input generators") were more proficient than students who did

not seek the opportunity to be exposed more to TL input (i.e., "low-input generators"). In

addition, Swain (1981) observed that immersion programs in Canada, which have

provided large amounts of L2 input to teach subject matter to linguistically homogeneous

classes of NNSs, have consistently produced successful outcomes when measuring the language proficiency of their L2 students against their peers, native speakers of the immersion language. However, due to the fact that the process of language acquisition and learning is under the influence of many co-occurring variables (such as learner variables, opportunities for interaction with NSs, conditions under which learning takes place, etc.), it is possible that the above mentioned evidence may be due to the quality of input the L2 learners have received as much as to the greater quantity of exposure to the target language. Other studies (e.g., Snow, Van Eeden & Muysken, 1981), investigating the effect of quantity of L2 input on SLA, have determined that exposure only to native speaker (NS) interactions in the target language does not appear to support SLA. Thus, it may be the case that not only the *quantity*, but also the *quality*, of input is important to L2 learning outcomes.

2.1.2 Quality of Input and SLA

The second major line of inquiry for research studies has focused on the quality of input to second language learners. There are a number of ways to evaluate the quality of input. In some studies, input quality is manipulated as the frequency and order of presentation of particular linguistic structures in the input to learners (e.g., Butoyi, 1978; Larsen-Freeman, 1976; Lightbown, 1980; Long, 1981). For example, Butoyi (1978) found a significant positive correlation between the frequency of noun phrase complement structures in native speaker speech directed to adult English as a second language (ESL) students and their production by learners. Additionally, Larsen-Freeman (1976) investigated input in the ESL classroom and found positive correlations between the frequency order of nine grammatical morphemes in the speech of two ESL teachers

and the learners' oral production of the same accuracy order. Larsen-Freeman concluded that the frequency of occurrence of the morphemes in the learners' input was "the principal determinant of the oral production ESL morpheme acquisition order" (1976, p. 48). On the basis of these studies, there is evidence that frequency of exposure to structures in the linguistic input may relate to more accurate production of these structures in required communicative contexts. However, no definite conclusions can be made about the causal relationship between the input frequency and the process of SLA, as the results of the research described above are correlational only.

In other studies, the focus has been on other qualitative aspects of input to L2 learners, in particular modifications made by speakers to increase learners' ability to comprehend their speech. Krashen (1980, 1981, 1982) hypothesizes that in order for input to become "intake" and, therefore, to support language acquisition, it must first be comprehensible to the learner, and this may be achievable if speech adjustments are made when providing input to nonnative speakers (NNSs). In support of the notion that modified input facilitates comprehension, Long (1985) has provided evidence to empirically validate his argument that this adjusted input to NNSs could be an indirect causal variable of SLA. The participants in Long's study were NNSs of English and came from a variety of L1 backgrounds. Their English proficiency was tested at the beginning of the semester and assessed as intermediate. They listened to two versions of a lecturette on Mexico. While the first version was written in an academic yet informal style intended for university students who were NSs of English, the second version of the lecturette was modified and intended for NNS learners. The modifications included slightly less complex syntax (measured by average length of T units in words and average number of

S nodes per T unit), many rephrasings and restatements, and slower rate of speech[1].The NNS-directed version of the lecturette had also more words than the NS-directed version. NNSs exposed to the adjusted version of the lecturette exhibited significantly higher comprehension scores on the content of the lecturette than did the NNSs exposed to the NS version. Long claims that the findings of the study are consistent with the hypothesis that speech adjustments made by NSs when addressing NNSs facilitate nonnative comprehension and thus, these results indicate a causal relationship between the input modifications and the comprehensibility of the message directed at NNSs. Furthermore, if one assumes a causal relationship between comprehensible input and SLA, an "*indirect causal relationship between linguistic and conversational adjustments and SLA*" (Long's italics) can be deduced. The Long (1985) study involved a variety of speech modifications in the NNS-directed lecturette; it is, therefore, not clear exactly which modifications led to greater comprehension by NNSs in this condition. In addition, in order to better understand the role of modified input in second language acquisition, it is necessary to know what modifications native speakers typically make when communicating with nonnative speakers. We begin with a discussion of different types of modified input and the terms used to refer to them.

2.2 Modified Input and Teacher Talk

A number of studies (e.g., Clyne, 1981; Ferguson, 1971, 1979; Freed, 1980; Hatch et al., 1978; Henzl, 1973, 1979; Larsen-Freeman, 1976) have examined interactions between native and nonnative speakers to determine what types of

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[1] Long did not define the measure 'T unit' in his study; however, Hunt (1970) defines the T unit as a principal clause with all related dependent clauses. Long (1980) describes the S nodes as clauses identified by a tensed verb.

modifications NSs employ when they communicate with NNSs. This phenomenon, presenting a modified variety of language in a specific social context with participants who do not have equal facility of the language in use, was identified by Ferguson (1971) as a subsystem or "register" of the language and originally termed 'foreigner talk'(FT). The term was forged as a parallel expression to "baby talk" (BT) register, speech used by adults when speaking with babies or young children who do not have full adult competence in the language (Ferguson, 1964, 1977). In this interpretation, BT and FT are "two of a family of simplified registers" which find their addressees among those who lack full competence in the language (Ferguson, 1981, p.10). According to Ferguson (1981, p.13), one of the advantages of the term is that it provides a "convenient label for a set of related phenomena"; however, FT by no means represents a uniform type of speech accommodation. As a language register, FT represents a language variation influenced by situational factors that include the speaker and the addressee, in this case NS and NNS, the roles they play in the discourse, the topic discussed, the setting of communication, and the mode and the form of discourse (Fishman, 1972; Hymes, 1962). Although generally the interlocutors engaged in communication involving FT are a native speaker and a nonnative speaker, all other elements of this communicative situation may vary. This interaction may take place in formal or informal settings, or in noneducational or educational environments. Moreover, the roles of the talkers in the discourse may be different as also may be the mode (oral or written), form (narrative or other type of discourse), and purpose of discourse (educational, exchange of opinions, debate, etc.). This variability of the parameters of communicative context may be reflected in different modifications made by the NSs addressing their nonnative listeners. In this regard, some

concern has been expressed in research that L2 teacher talk in classrooms, often named

FT in the classroom or teacher FT, may represent a distinct sociolinguistic register,

different from NS speech to NNSs in noneducational settings, mentioned above as

foreigner talk (Chaudron, 1988; Henzl, 1979).

Studies which have investigated the phenomenon of FT can be classified into

different types based on the environment of FT production and the roles of the

participants in the interaction. Whereas some studies (DeLima, 1985; Freed, 1980, 1981;

Long, 1981; Ulichny, 1979) have investigated FT in noneducational contexts to find out

what the parameters of FT simplification are and how the adjusted input facilitates NS-

NNS communication, other studies (Chaudron, 1982; Downes, 1981; Griffiths, 1990;

Hakansson, 1986; Henzl, 1973, 1979; Mannon, 1986) have focused on finding

characteristics of teachers' speech to NNSs that are peculiar to the L2 classroom and have

effects on L2 learners' comprehension and learning. While the research literature

provides a clearer distinction between BT and FT as simplified but still different types of

registers by comparing their similar features and demonstrating that they differ in terms

of speech volume, phonological modifications, use of diminutives, inclusion of foreign

words, and time-space orientations (Freed, 1981), the terms FT and L2 teacher talk (TT)

are often used interchangeably by some linguists in their studies due to the fact that

'teacher talk' is seen as a variety of 'foreigner talk' used in a classroom setting by

teachers. For example, Hatch (1983, p.64) states "This register has sometimes been called

"foreigner talk" and /or "teacher talk" (though it is not limited to language teachers nor is

it spoken by foreigners." Hatch thus implies that FT and TT are forms of the same

simplified register in contrast to Ferguson (1981) who explicitly distinguishes FT, BT,

and TT as different registers. Other researchers have claimed that TT is different from both BT and FT in that TT is more grammatical (Cazden, 1979), referring thus to studies that have reported ungrammatical varieties of FT.

Hallett (2000, p.27) notes that teacher talk as it has been used to describe teachers' speech to a group of NNSs is 'misleading' because the term teacher talk also has been used to describe a NS teacher's language to his/her NS students. TT and FT differ in the functions and circumstances of their use (Hallett, 2000, p.28). Additionally, after reviewing several studies on L2 teachers' speech, Chaudron (1988, p.55) concluded that although teacher talk in L2 classrooms differs from speech in other settings, it does not exhibit differences that are qualitatively distinct and systematic enough to be identified as a phenomenon of another special sociolinguistic domain. Chaudron suggests that teacher talk adjustments to NNS learners have a temporary character, and once they serve their purpose of supporting and promoting communication, they may change their nature, and thus this type of interaction does not represent an entirely different social situation. For the purposes of this study, we will use the term teacher talk to refer to linguistic phenomena from the realm of L2 classroom instruction with the remark that TT also bears similar features with FT as being speech of NSs, modified and directed to NNSs to facilitate their comprehension.

2.3 Linguistic and Interactional Features of Teacher Talk

Studies investigating teacher adjustments reveal that teachers not only alter the interactional frame of the discourse they produce when addressing NNSs, but also modify the syntactic, lexical, and phonological features of their speech to L2 learners (Downes, 1981; Gaies, 1977; Hakansson, 1986; Long & Sato, 1983; Mannon, 1986).

2.3.1 Discourse Features of Teacher Talk

A number of researchers have focused on the conversational adjustments that are made by NSs when speaking to NNSs in order to facilitate comprehension and convey the message of communication (Early, 1985; Gaies, 1981; Hamayan & Tucker, 1980; Hatch, Shapira, & Wagner-Gough, 1978; Long, 1981; Pica & Long, 1986). A group of studies has investigated more global features of teachers' discourse such as conversational framing moves (Early, 1985; Pica & Long, 1986). Although there was a trend in teachers' discourse to use more conversational frames when addressing L2 learners in comparison with NSs, no significant difference was found in post hoc comparisons (Early, 1985).

Long (1983) has investigated six features of the interactional structure of NS speech addressed to NNSs relative to NS speech to other NSs and found significant differences; these discourse features in focus include confirmation checks, comprehension checks, clarification requests, self-repetitions, other repetitions, and expansions. Employing Long's approach of analyzing NS discourse directed to NNSs, some studies have analyzed NS teacher repetitions quantitatively, assuming that repetitions would allow second language learners more opportunities to process the information (Early, 1985; Ellis, 1985; Hamayan & Tucker, 1980; Wesche & Ready, 1985). Hamayan and Tucker (1980) observed that French immersion teachers used exact or paraphrase repetitions that were 20% and 24% respectively of all the strategies in their lessons. In a follow-up study on a previous finding, Wesche and Ready (1985) found that the French and English professors, who were participants in the study, employed significantly more words in exact and rephrased repetitions with their L2 learners than

with their L1 classes. In addition, Early (1985) found that ESL teachers use significantly more repetitions in their speech directed to L2 learners, compared with teachers speaking to NSs. However, Ellis (1985) examined the frequency of repetitions produced by an ESL teacher in speech to two adolescent L2 students in classroom interaction over time and found a significant decrease in frequency of repetition during the 9-month period as the language learners' competence increased. It appears that repetitions are used by teachers in their speech as discourse modifications to aid L2 listeners' comprehension by giving them more opportunities to perceive and process information. Regrettably, none of the studies mentioned above investigated how using repetitions as discourse modifications affected learners' comprehension and processing of linguistic information. However, some evidence is available that repetitions may increase recognition and recall scores of NNSs in an aural comprehension task. For example, Chaudron (1983) found that among five topic-reinstatement devices only the recognition and recall scores from a listening task were significantly higher for repeated nouns than for simple nouns, if-clauses, and synonyms.

Similar to other FT studies (Hatch, 1983; Long, 1983), conducted in nonclassroom contexts, some TT studies (Ellis, 1985; Kleifgen, 1985; Wesche & Ready, 1985) have found that teachers also modify their conversation to NNSs by using communication devices, such as confirmation and comprehension checks, and clarification requests. However, no significant differences have been found in such adjusted NS–NNSs interactions in comparison with speech directed to NSs (Wesche & Ready 1985). In addition, comprehension and confirmation checks, and clarifications did not differ significantly when measured at different times (Ellis 1985). As Kleifgen (1985)

provides only a qualitative description of discourse adjustments in TT, mentioning that clarifications constituted 22.5% of all teacher utterances, the study does not give any comparison with NS discourse, and thus, without a baseline measure, those TT conversational adjustments cannot be evaluated as truly characteristic for NS teacher speech to NNSs. They are merely typical for any TT directed not only to NNSs but also to NSs in teaching environments. Finally, Ellis (1985) demonstrated a significant difference in expansions used in teacher speech to NNSs over a period of time while Wesche and Ready (1985) found a significant increase in the use of imperatives (e.g., let's, suppose that, imagine that, etc.) by an English-speaking professor when presenting a lecture to NNSs of the target language.

In summary, based on the preceding discussion, it is apparent that the discourse features described by Long (1983) are not necessarily present in the speech produced by different teachers that is directed to NNSs, and these features are not significantly more or less frequent in the discourse directed to NSs. More research is needed to shed light on modifications in teacher discourse to nonnative speakers.

2.3.2 Syntactic Features of Teacher Talk

So far among the most investigated features of teacher talk to NNSs have been teachers' syntactic adjustments made to facilitate learners' comprehension and linguistic processing of information. These syntactic modifications are found to affect teachers' length of utterances, distribution of sentence types (e.g., declarative forms, interrogatives, and imperatives), use of less marked linguistic structures (e.g., simple present tense verbs), grammaticality of utterances, and use of subordinate clauses (Chaudron, 1988).

First, although a number of studies (Dahl, 1981; Early, 1985; Gaies, 1977;

Hakansson, 1986; Henzl, 1979; Ishiguro, 1986; Kliefgen, 1985; Mannon, 1986; Milk, 1985; Mizon, 1981; Steyaert, 1977; Wesche & Ready, 1985) have examined the length of utterance in teacher speech, the findings are not consistent and are often even conflicting. The differences across studies may be due to different measures employed to analyze the syntactic modifications (e.g., length of utterance, sentence, or T unit); in addition, studies differ in how they define "word" and how the analyzed speech is segmented (e.g., by intonation contour and pauses, by sentence, by T unit). Nonetheless, comparisons between and within studies suggest that speech directed to NNSs tends to contain shorter utterances as measured by the number of words that comprise an utterance, a sentence, or a T unit. For example, Mizon (1981) segmented TT to L1 and L2 speakers by using intonation contour and pauses, and found that utterances directed to NSs were longer than utterances to NNSs. Kliefgen (1985) segmented teacher talk to kindergarten children using MLU (mean length of utterance) and found that the shortest MLUs (3.18 words) were addressed to the L2 child at the lowest level of language proficiency while the longest MLUs (5.27 words) were directed to the L1 child in the group. However, in both studies, significance of comparison between NSs and NNSs has not been tested. Henzl (1979) and Hakansson (1986) also found their participants using shorter sentences in their speech to NNSs than in speech for NSs. Moreover, in Henzl (1979), the length of sentences to beginners was 5.8 words while those to advanced speakers averaged 10.1; in contrast, the mean number of words per sentence addressed to NSs was 19 words. In addition, comparing length of sentences in teachers' classroom talk at periods of 5 weeks, Hakansson found that the mean words per sentence for each teacher increased over time, from 5.36 to 6.28, which was still lower than the mean words per sentence in speech to

NSs. Although these differences in the studies discussed above were not tested statistically, their findings suggest that teachers modify the length of their utterances by downsizing them when talking to less proficient learners and increase the length over periods of time as the learners' proficiency improves. Some studies have provided statistical evidence for differences in speech addressed to NSs and NNSs. (e.g. Early, 1985; Gaies, 1977; Ishiguro, 1986; Mannon, 1986; Wesche & Ready, 1985). These studies have revealed significant differences across conditions, indicating that L2Ls received much shorter utterances than NSs. Mannon's (1986) analysis of T unit length also demonstrated a significant difference, with shorter utterances addressed to the NNSs than NSs.

However, in contrast to the evidence provided by the abovementioned studies, Dahl (1981) reported that the mean words per T unit in teachers' speech directed to L2 speakers is very close in value to the mean number of words per T unit addressed to NSs. Similarly, Steyaert (1977) found that the difference was not significant although language teachers tended to use shorter utterances to NNSs. Wesche and Ready (1985) presented mixed results—a significant difference between T units in the English-speaking professor talk to NNS and NS students, and there was no significant difference in the French-speaking professor speech to L1 and L2 learners when T units were compared. Perhaps other factors, such as task variables and variety of NS individual characteristics, could provide a plausible explanation for the relatively high values of mean words per T unit (range 9.1-14.9) in teachers' talk to NNSs in this study. It is, therefore, necessary to conduct more research on the syntactic modifications in teacher talk in order to come to more definite conclusions.

Another syntactic adjustment in teacher speech to NNSs concerns the use of sentence types such as declaratives/statements, interrogatives, and imperatives. While these sentence forms are found to exist in discourse in general, it is important to examine how they are distributed in TT directed to NNSs. The distribution of these sentence types exhibited significant differences across comparison conditions in Long and Sato (1983) and Pica and Long (1986). Early (1985) found declaratives, interrogatives, and imperatives to be significantly different between NSs and nonnative learners. Mizon (1981) demonstrated a significantly higher proportion of questions in teachers' speech addressed to NNSs relative to speech for NSs, suggesting that they may reflect teachers' efforts to check learners' comprehension.

Considering evidence about ungrammatical linguistic input produced by NSs in interactions with NNSs provided by FT studies (Ferguson, 1971), researchers conducting TT investigations found that generally, teachers use grammatical forms in their speech to NNSs (Downes, 1981; Hakansson, 1986; Henzl, 1979), which may be attributed to the pedagogical functions of teacher talk. However, ungrammatical TT has been also reported involving omissions of function words, copulas, subject or object pronouns, and articles (Downes, 1981; Hakansson, 1986; Ishiguro, 1986; Kliefgen, 1985). One reason that could motivate the use of these ungrammatical utterances could be teachers' adaptation to the learners' low level of proficiency, with the tendency of these ungrammatical forms to disappear with learners' increase of language competence (Kliefgen, 1985).

The next TT syntactic adjustment is the use of less marked linguistic structures in teacher speech. Investigators have found the use of a higher proportion of verbs in simple

present tense in TT (e.g., Henzl, 1979; Mizon, 1981; Long & Sato, 1983). Long and Sato (1983) have demonstrated a significant difference for present tense structures in speech to NNSs in comparison to present tense verbs in speech directed to NSs, while Wesche and Ready (1985)) found that only the English-speaking professor's present tense forms of "to be" were significantly different in his speech to NNS learners comparing to the forms of "to be" found in his speech to NS students. Moreover, Henzl (1979) reported less inflectional complexity, lack of passive constructions, and limited use of case roles in teachers' talk directed to NNSs; however, no quantified comparisons were made in her study. Additionally, not only Henzl (1979) observed an avoidance of conditionals in NS teacher speech, but also Wesche and Ready (1985) did so, for the English-speaking professor. As evident in the findings from the studies in this discussion, teachers tend to employ linguistic forms less marked and more contextually embedded in the "now and here" when addressing nonnative learners. However, the lack of systematic criteria for a comparison of markedness across studies, combined with limited statistical data, impedes the process of adequate evaluation of its value as an adjustment in teacher talk.

Lastly, a number of studies (Dahl, 1981; Hyltenstam, 1983; Mannon, 1986; Pica & Long, 1986; Steyaert, 1977; Wesche & Ready, 1985) have examined syntactic subordination in TT as measured by the number of clauses per T unit. Most of them reported no significant difference in degrees of subordination for teacher talk to L2 learners compared to the baseline of NS-NS interactions. However, some evidence has been found to support the hypothesis that teachers' speech to L2 learners is significantly less complex (fewer subordinate clauses in T units) than speech to NSs (Early, 1985; Gaies, 1977; Ishiguro, 1986; Milk, 1985).

In sum, based on the preceding discussion, it is apparent that teachers syntactically modify their speech to L2Ls, and these modifications affect the use of sentence types and degree of subordination, less marked linguistic forms, grammaticality, and the length of sentences. However, no systematic evidence was found in the studies previously mentioned that suggest such syntactic adjustments in teacher talk are always significantly different from the baseline NS data, and statistical analyses were not used in all studies. Future research is necessary to elucidate the nature of syntactic adjustments in teacher talk and their effect on learners' comprehension and language development.

2.3.3 Lexical Features of Teacher Talk

Studies that have examined the lexical features of teachers' speech directed to nonnative speakers have found that teachers tend to use a set of high frequency or more basic vocabulary items in their discourse (e.g. Chaudron, 1982; Henzl, 1979; Kliefgen, 1985; Mizon, 1981). Henzl (1979) observed that lexical items chosen by teachers included fewer idioms, more proper and concrete nouns, and fewer indefinite pronouns. Moreover, teachers used fewer colloquial lexical items than standard forms that are stylistically neutral. Similarly, Mizon (1981) reported that more proper nouns and a less diverse pool of content and function words were found in the speech of an ESL teacher (a NNS of English) in India to students learning English. Using the most common measure of vocabulary simplicity, token-type ratio (the higher the value, the less variety among lexical items), Mizon (1981) calculated ESL teacher's ratios as being 7 and 7.5 for content and function words, respectively, when producing teacher talk to L2Ls while the other participant, a NS British teacher, had ratios of 2.3 and 4.3 when addressing NNS learners. Kliefgen (1985) observed in the speech of a kindergarten teacher the differential

choice of lexical items when addressing three NNS children and a NS child. Higher token-type ratio for two of the NNSs (3.0 and 2.46) indicated that the teacher's vocabulary items were less diverse while the token-type ratio for the NS child was 2.07 exhibiting more variability of lexical items. Although Henzl (1979) compared verb token-type ratios across participants (NS teachers) in her study and narratives, produced by the teachers in their speech to NNSs of the target language, and reported a broad range of values (1.0-5.3), it is hard to assess these findings in terms of meaningfulness because inferential statistical analyses were not used in the study.

In contrast to the evidence that suggests teachers' use of less varied, high frequency, or basic vocabulary (e.g., "house" instead of "mansion", "show" instead of "depict") with NNSs, Wesche and Ready (1985) showed no significant differences in two professors' speech to NSs and NNSs compared by type-token ratio or word-class distribution (content and function word categories). The first professor, NS of English, had type-token ratios of 29.8% and 26.6% when speaking to L1 and L2 students, respectively, while the second professor, NS of French, had the same ratio of 31% in speech to L1 and L2 learners. In addition, the NS of English participant used 54.2% content vocabulary to L1 students and 55.2% to L2 learners; the French-speaking professor employed 40% and 37% content words to L1 and L2 students, respectively. Both professors, NSs of English and French, presented a psychology lecture in English and French respectively that had identical content to a class of NSs and a class of NNSs. It is possible that the advanced level of the language learners and the presented academic content were the factors affecting the professors' choice of lexical items and their decision to maintain similar variety in NS and NNS classes. In light of the discussed

studies, it is evident that more research is needed to investigate the lexical modifications of TT to NNSs at various levels of proficiency and their effects on learners' comprehension and information processing.

2.3.4 Phonological Features of Teacher Talk

Phonological features of teacher talk are the focus of the present investigation. The phonological features modified in teacher input that have been investigated include: rate of speech and pauses, pitch, intonation, and stress, and articulation of segments (Dahl, 1981; Griffiths, 1990; Hakansson, 1986; Henzl, 1979; Ishiguro, 1986; Kelch, 1985; Long, 1985).

2.3.4.1 Speech Rate and Pauses

Rate of speech (SR) has been investigated in both L1 and L2 studies. While in L1 research has been concerned with the issue of optimum SR in the process of producing speech for various purposes (Boomer, 1965; Butterworth, 1980), in L2 the focus has centered on the role of speech rate in facilitating NNS perception and comprehension of NS speech.

Second language acquisition literature presents a number of descriptive and controlled studies (Dahl, 1981; Hakansson, 1986; Henzl, 1973, 1979; Steyaert, 1977; Wesche & Ready, 1985; Mannon, 1986) that have examined teachers' speech to find out whether teachers modify their speech rate when talking to NNSs. Such studies found that teachers' rate of speech was slower in comparison with other contexts and conditions. In Steyaert's study (1977), six teachers participated in an elicitation task that required telling a story twice to NSs and intermediate L2 students. Their mean rate of speech was 150.65

words per minute (wpm) when narrating a story to NNSs, and 164.13 wpm to NSs on the second telling of the story; this difference in speech rate was significant. It appears from this study that NS teachers realize that different audiences, NSs and NNSs, may have different communicative needs, and they make an effort to modify their speech rate to accommodate these needs. On the other hand, we cannot be sure that learners' communicative needs are actually met, since the study does not shed any light on whether this adjusted rate of speech affected NNSs' comprehension of the story.

Further evidence of NS adjustment of speech rate when speech is directed to L2 learners is provided by Dahl (1981). In a one-way description task, six L2 teachers and six graduate student NSs without experience in teaching described a picture to assumed audiences of NSs and to advanced, intermediate, and beginning NNSs. To be able to appropriately address the listeners according to their language proficiency, the subjects listened to tape recordings with examples of NNS speech at each level. Both the L2 teachers and the NS nonteachers, when addressing NSs, had similar rate of speech, 154wpm and 153wpm, respectively. However, their speech rate decreased when talking to NNSs, and varied according to NNS proficiency level. Nonteachers spoke to advanced and intermediate L2 learners with a rate of 139wpm and 148wpm, respectively, while teachers' speech rate was 146wpm to advanced and 136wpm to intermediate learners. Although the mean rates of all the NS subjects were similar for the advanced and intermediate L2 learners, the teachers' SR to beginning listeners was 110wpm; the nonteachers spoke at 112wpm to the same type of audience. Analysis of variance indicated this difference to be significant for both groups of NS subjects. However, the outcome obtained in the study may also be accounted for by the nature of the task. As the

subjects completed the description task only to assumed audiences of learners at different proficiency levels and NSs, no feedback was available to them during the task; this might account for the speakers' similar rates of speech to assumed advanced and intermediate learners. Another factor that might account for the findings of the study is that the subjects modified their rate of speech noticeably to beginner NNSs because the tape showing nonnative speech at the lowest level of proficiency might have distinctive enough features of foreign speech than the other tapes. Thus, some weaknesses of Dahl's study design limit the conclusiveness of the results.

Henzl (1979) observed that NS teachers are inclined to adjust their speech rate when telling stories to less proficient listeners of the target language. In a storytelling task, teachers using two picture sequences recounted narratives varying their speech rate according to the level of the language competence of the NNS classroom groups. Czech, English, and German teachers, NSs of Czech, English, and German respectively, spoke to advanced NNSs of the TL (target language) at 78wpm, 152.4wpm, and 126.7wpm, respectively, and they decreased their rate of speech to 54.1wpm, 107.6wpm, and 99.5wpm when narrating the stories to language beginners. In comparison, the subjects increased their speech rate to 118.2wpm (Czech), 203.8wpm (English), and 137.6wpm (German) when they presented the stories to NSs. Only one subject, a German teacher, spoke faster to NNSs than to NSs. The findings of Henzl (1979) provide a range of results that support the observation that NS teachers make efforts to adjust their speech and particularly to decrease their rate of speech directed to NNSs. The question that remains open is what effects the reduced speech rate has on L2 learners' comprehension.

Another study investigating real instructional classroom speech (Hakansson 1986)

uncovered a similar pattern of findings. Eight Swedish teachers participated in the study by having their speech rate to beginning nonnative listeners recorded at 5-week intervals. Hakansson (1986) found that the subjects increased their rate of speech from 79 wpm to 125 wpm through time. However, the study design did not include a comparison that would allow analyzing the speech rate directed to NNSs and rate of speech delivered to NSs of the TL.

However, Wesche and Ready (1985) have come to contradictory findings relative to the examined speech rate of two university professors in "sheltered" university psychology classes comprised of L2 advanced learners of French or English. After identical lectures were delivered to NNS and NS students, Wesche and Ready compared the professors' rate of speech and found that while the English professor decreased his speech rate to NNSs to 90.1wpm compared to 134.5wpm for NSs, the French professor kept the same rate of speech. The study does not provide an explanation of this observation. One can only assume that several factors might play a role in such discrepancy pertaining to French versus English language-specific norms, various individual characteristics of the professors, or some peculiarities of the instructional context. The researchers did not investigate the relationship between rate of speech and learners' comprehension of the material taught in both of the psychology classes.

Evidence of employing a slower rate of speech in a lecture delivered to NNSs of English was provided by Mannon (1986). In this study, a linguistics professor presented the same lecture to a NS class and to a low-intermediate academically oriented L2 class. The subject spoke at 122.97wpm to the class of native speakers and at 112.26wpm to nonnative-speaker students. Although this finding does not differ from the evidence,

provided by some studies, for decreased speech rate of teachers to NNSs of the TL, the factors influencing the slower SR were not clearly determined in this study. Moreover, the effects of reduced SR on L2 learner comprehension have not been investigated, and no conclusion can be made in regard to what learners gain from such adjustment of rate of speech.

An interesting comparison between the SR of NS teachers and NNS teachers directed to L2 learners in classroom setting is presented by Ishiguro (1986), whose study included nine nonnative-speaker teachers and native-speaker teachers. The teachers' rate of speech to EFL learners at three levels of language competence was examined, and the results revealed significant differences across levels for the NS teachers, but not for NNSs. While the NS instructors spoke at 111.49wpm, 106.73wpm, and 97.53wpm to advanced, intermediate, and beginning NNS students respectively, the NNS teachers conducted their task to the three levels of EFL learners using the same speech rate, not differentiating among the language proficiency levels. The study does not discuss this conspicuous difference between NS and NNS teachers' SR, neither provides an explanation of the phenomenon. However, post hoc analyses informed that NS teachers' speech rate was significantly increased in addressing their peers in comparison with L2 learners.

In contrast to the widely popular acceptance of the possible decrease of the teachers' speech rate observed in previous research, Griffiths (1991) conducted a study that investigated the rate of teacher speech addressed to L2 learners of different proficiency levels in a classroom environment and found no significant difference. In addition, the SR of the language instructors did not significantly differ over time, neither

did the SR in the language classes differ from NS - NS utterances. Although some evidence is found, as the discussed studies reveal, that teachers decrease their rate of speech addressed to nonnative learners, more research is necessary to better understand speech rate modifications and the variety of factors that determine them.

Pauses are another feature of teacher speech to NNSs observed in several studies. Although they can be viewed as a factor that influences the rate of speech, pauses may independently contribute to L2 learners' comprehension and processing of nonnative linguistic material (Griffiths 1991). Pauses may allow NNSs time to process the message or information and construct their response if it is necessary.

Chaudron (1982) builds on the work of Ferguson (1981) and Henzl (1979) to provide a list of characteristics of teacher talk (or, in his terms, 'classroom' talk) by studying the speech of English language teachers to NNS students. Chaudron (1982, p.171) offers only a few details about the methodology of his study, in which he has identified five structures of relationships of teacher FT. As part of the phonological structure of the teacher language, he mentions pauses as being used by the teachers to segment their speech to the L2 learners; however, he does not provide quantified evidence of the amount and length of pauses. Chaudron (1982) describes the observed teacher utterances containing pauses as having sometimes 'a choppy' quality. Although Chaudron's (1982) study aims to design a more detailed framework for researchers investigating teacher talk, it is somewhat limited in what it has to offer for future research. He does not explain how he has operationalized the terms used in his study or how the teachers' adjustments may lead to comprehension of language.

Henzl (1973, 1979) also observed more and longer pauses in her subjects' speech

to NNSs compared to NSs; however, no attempt was made to quantify the mean duration or number of pauses. Downes (1981) examined native-speaking teachers' and NS nonteachers' speech to NNSs and found that teachers' talk included more extended pauses than nonteacher speech. Seven out of 10 teachers used pauses versus 2 out of 6 nonteachers. The effect of pauses on NNS comprehension and language processing has not been investigated.

In seeking to explain the slower rate of speech of teachers who participated in her study, Hakansson (1986) analyzed one teacher's pauses using an oscillogram and found that the length of the majority of the pauses was about 95 csec. In addition, the length of the longest pauses was 150 csec. This finding was compared with studies on standard Swedish which displayed pauses of 60 csec in length, rarely exceeding 100 csec.

More quantitative evidence is necessary to examine the nature of pauses in teacher talk to NNSs with regard to their role in facilitating NNS comprehension and processing of linguistic input. Moreover, further investigations should analyze not only the amount and length of pauses in TT, but also their location in the discourse.

2.3.4.2 Pitch, Intonation, and Stress

Hatch (1983, p.154) describes the input addressed to language learners as higher pitched and characterized with intonation variation. While this was found to be true when adults speak to L1 learners (BT or motherese), a recent study (Biersack et al., 2005) compared the prosodic features of BT and FT and found that NSs tended to increase their pitch range only in BT, but not in FT. They also found that there was a trend for pitch range to be slightly narrower in FT. The results from the study are in contrast with the accepted claim in the research literature that FT/TT displays a wide range of pitch.

Although Henzl (1979) reported that NS teachers of Czech, German, and English spoke louder and used more standard pronunciation to NNSs, the findings from her study are not generalizable as the comparisons were not quantified. In contrast, Downes (1981) found it difficult to distinguish differences in loudness of speech directed to NSs and NNSs. In addition, Downes did not observe teachers exaggerating their intonation to L2 learners. Contrary to this observation was Chaudron's (1982) report of teachers' rising final intonation and emphasizing stress to NNSs in order to focus their attention on teachers' speech. The lack of quantification of prosodic features in TT does not allow any definite conclusions as to being distinctive only for teacher speech addressing nonnative learners and serving any instructional purposes.

2.3.4.3 Articulation of Segments

Henzl (1979), Mannon (1986), and Downes (1981) observed that teachers' articulation of the speech segments was clearer when they produced speech to NNSs. In these studies, clear articulation was operationalized as a variety of features, including released final stops, fewer reduced vowels, and fewer contractions. Voiced final stops were fully voiced, and some glottal stops were used before words beginning with Vs (Hatch, 1983, p.183). Additionally, Mannon (1986) noted more careful enunciation and significantly fewer contractions with auxiliary verbs (37% versus 86% in speech to NSs). Downes (1981) observed that 100% of NS teachers in L2 classrooms exaggerated their articulation in comparison with speech directed to NSs in other environments. As it was stated before in discussion about the TT prosodic features, the relative lack of quantitative evidence about the articulation adjustments in teacher speech hinders any definite conclusions about their distinctiveness as teacher modifications to NNSs and

their role in NS teacher-L2 learner communication.

2.4 Teacher Talk in Language Teacher Education

If teacher talk can facilitate learner comprehension (and therefore, possibly,

acquisition of the L2), the ability to produce effective teacher talk should be a focus of

second language teacher preparation. The present researcher examined 10 textbooks in

order to find out how teacher speech to nonnative learners is described in materials with a

purpose to train and help future teachers and teachers in service use teacher talk

effectively. Only 2 textbooks (out of 10 examined) presented any explicit information

about teacher talk. First, Hadley (1994, p.175) gives the following description of "teacher

talk":

> "Teacher talk" or "caretaker speech" is another type of listening
> material that contributes to the acquisition of the language….it tends
> to consist of a simplified code, characterized by slower, more careful
> articulation, the more frequent use of known vocabulary items, and
> attempts to ensure comprehension via restatements, paraphrases, and
> nonverbal aids to understanding.

While the features of teacher talk from this description correspond somewhat to

the findings from the studies investigating teacher speech to NNSs, it is puzzling why for

the author "teacher talk" and "caretaker speech" are considered the same phenomenon, as

it has been established that although they are similar, being two simplified registers, they

also exhibit different linguistic features. In addition, they differ in roles of the

interlocutors and in sociolinguistic context of production. Furthermore, "caretaker

speech" is characteristic for L1 speakers talking to NS children while "teacher talk" is

attributed to teachers addressing NNSs. It is also not clear in the description cited above

whether this "listening material" is produced by teachers or some other foreign to the L2

classroom sources. The lack of a clear and well-defined framework of the linguistic features of teacher talk, as evident in Hadley (1994), necessitates action from researchers and textbook writers that should result in developing materials for teachers in training in order to increase their professionalism, knowledge, and teaching skills in L2 classroom settings.

Second, Lee and Van Patten (2003, p.33) describe "teacher talk" as "specialized input that instructors often use" to language learners. They cite Hatch's (1983) and Larsen-Freeman's (1985) descriptions of simplified input to show what linguistic features of teacher talk are modified with regard to rate of speech, vocabulary, syntax, and discourse. Thus, drawing on evidence provided by research examining teacher speech to L2 learners, Lee and Van Patten (2003) have written a book most useful and valuable for current and future teachers.

Though it is widely asserted that teacher talk improves the comprehensibility of input to language learners, and that this comprehensibility in turn leads to gains in second language acquisition, relatively few empirical studies have specifically investigated these hypotheses. The next section reviews the limited research investigating the effectiveness of the phonological modifications made in teacher talk.

2.5 The Effectiveness of Teacher Talk

The only phonological feature of teacher talk that has been studied with respect to its impact on learner comprehension is speaking rate. Dahl (1981) investigated the relationship between SR and the comprehensibility of the message. The term 'comprehensibility' is used here as it has been defined in Derwing and Munro (1997) and refers to judgments on a rating scale of how difficult or easy a piece of discourse or

utterance is to comprehend. However, here the term is employed with respect to nonnative speakers' perception of intelligibility of a message. Sixteen L2 college students were chosen to judge the more understandable descriptions produced by NS teacher subjects in a description task. Although they evaluated the most comprehensible messages as messages spoken at a slower speech rate, their judgments did not correlate with the measured speech rate. Dahl concluded that some other characteristics of speech unmeasured in the study such as clarity of articulation may have contributed to the perceived rate of speech as the subjects judged less understandable messages as comprehensible.

Among the few studies investigating the effect of a slower rate of speech on learner comprehension is Kelch (1985), the results of which suggest a positive influence of slower SR on comprehensibility. In the experiment, when the rate of speech of lecture was decreased from 200wpm to 130wpm, it resulted in L2 learners' significantly greater success in dictation. Therefore, some support for the notion that slower speech rate to NNSs improves comprehension can be found.

Conrad (1989) and Griffiths (1990) claim that modified speech rate facilitates NNS comprehension by giving them more processing time. This assumption is based on the results of Conrad's study, which investigated the effect of high-compressed speech on NNSs comprehension. Conrad observed that even NNSs at a high-proficiency language level experience serious problems in comprehending speech delivered at relatively fast rates. They were able to recall only 72% of delivered sentence items when the SR was decreased to 196wpm. Intermediate level LLs recalled only 44% at the same rate. These findings suggest the importance of slower rate of speech for nonnative listening

perception and comprehension of the linguistic material.

Grosjean (1972) provided evidence that slower SR of 147 wpm caused a 14.65%
increase in comprehension test scores of intermediate level learners. When NNSs listened
to passages articulated slowly and with a higher number of long-duration pauses, their
comprehension increased by 24%. In addition, Conrad (1989) found that subjects at an
intermediate level of language proficiency showed increased comprehension when the
rate of speech was reduced, possibly allowing more time for the linguistic items to be
processed. Griffiths (1990) also investigated the effects of 3 SRs on the comprehension of
low-intermediate nonnative speakers of English. Even though a rate of 200 wpm resulted
in reduction in their comprehension, the slowest rate of 100 wpm did not increase their
performance as measured by scores from a comprehension task. In fact, similar scores
were achieved at both of the speech rates of 100 and 150 wpm.

Based on the preceding discussion, it is evident that the slower rate of speech
produced by teachers might affect learners' comprehension by allowing NNSs more time
to perceive and process linguistic information. However, the limited number of studies
focused on examining the effects of SR on L2 comprehension does not allow more
definite conclusions; more extensive research should be conducted to investigate the SR
effects on comprehensibility of the message directed to NNSs. Even though there is some
evidence that a slower speech rate characteristic of teacher talk improves comprehension
by nonnative learners, there is little or no evidence that other phonological modifications
are similarly beneficial to learners. In an attempt to contribute to the understanding of
how phonological adjustments of teacher talk affect L2 learners' comprehension, the
research question for the present study is: Do the phonological modifications made by

teachers in their speech to nonnative listeners affect learners' comprehension in L2/FL setting?

In the present study, the phonological characteristics of teacher language directed to NNS learners were examined in terms of the adjustments teachers make to produce input that promotes learners' comprehension. The literature reviewed above provides evidence for the hypothesis that language learners will benefit from phonological modifications of teacher speech in classroom setting through increasing their comprehension of the presented listening material. L2 learners' comprehension in this study is measured by the accuracy scores from an auditory sentence-final keyword transcription task.

CHAPTER 3

THE STUDY

3.1 Participants

All participants in the present study were adults with normal hearing and no
speech-language disorders, as determined by self-report.

3.1.1 ESL Learners

Fifty-one nonnative English speakers[2] were recruited from the student population

at the English Language Institute (ELI) located on the University of Utah campus. The

ELI is designed to provide the international students who intend either to seek achieving

an undergraduate degree or to get admitted to graduate school in a higher education

American institution with intensive English language training. All of the participants

have been tested upon entrance to the ELI with a written and listening placement test in

order to evaluate their level of language proficiency. Some of the subjects have more

experience in an English-speaking environment whereas others have very limited

experience due to their short length of residence (LOR: 0-4 months). The sample was not

controlled for age, gender, or time spent learning English, as Ferguson (2004, 2007) did

not find these variables to have significant effect on performance in a listening

experiment. In accordance with our intent to make the results more generalizable, the

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[2] The author of this study has permission from the ELI to recruit participants for this study from the ELI
student population; IRB approval of the study was obtained.

listener sample was not controlled for time spent living in an English-speaking environment or language background. The native language background of the participants included Chinese, Korean, Japanese, Spanish, Portuguese, and Arabic.

3.1.2 Teachers (Talkers)

Four teachers who are native speakers of English produced the study speech stimuli. They have each worked at the English Language Institute for more than 1 year and have more than 1 year teaching experience (Mean of length of teaching: 11 years, range= 4-20 years). All recruited instructors have an MA either in Applied Linguistics or in TESOL.

3.2 Stimuli

The stimuli for the auditory sentence-final keyword transcription task for nonnative speakers of English were selected from the Bradlow and Alexander (2007) sentences because they were designed for use with nonnative listeners, are more authentic than nonsense sentences or carrier phrase stimuli, and the target (final) word in each sentence is manipulated for predictability. Therefore, the list, used in this study (provided in the Appendix), consists of 16 high-predictability and 16 low-predictability sentences chosen from the Bradlow and Alexander (2007) list of 120 sentences. In the rating method, each keyword in the sentence-final position was counted as one point. As Dickman (2009) notes, this could be problematic when keywords differ in their contextual predictability, and highly predictable keywords are worth the same number of points as less predictable keywords. However, the modified Bradlow and Alexander sentences allow for a comparison between high- context keywords and low- context

keywords to determine whether factor of predictability does indeed have an effect. In addition, this mix of high- context and low- context sentences reflect in some way natural speech as produced in authentic environment. To ensure that the sentences do not include any vocabulary items that may be unfamiliar to the NNS subjects, two ESL teachers who are familiar with the proficiency levels of the population of ESL learners attending ELI, from which the participants were randomly sampled, were asked to indicate any words that could be unfamiliar to the L2 learners. As they did not identify any unfamiliar words in the sentences, no items were removed from consideration as stimuli. Of the chosen sentences, equal amount sentences with high probability and low probability final (target) words were randomly selected for use as stimuli for the present study.

The four teacher-speakers were recorded producing the set of 32 sentences in both "conversational" and "teacher talk" speaking conditions. Each sentence was produced three times by each talker in each speaking style for a total of 192 repetitions (a total of 768 recorded sentences).The second token of each sentence by each talker was used in the auditory final keyword transcription task. The teachers were not informed ahead of time that they will produce two types of speech. First, they produced sentences in conversational speaking style, and then sentences in teacher talk style. To elicit conversational speaking style, teachers were instructed to read the sentences as if addressing "somebody familiar with their voice and speech patterns" (Bradlow & Alexander 2007) or a person who is a native speaker of English. Teacher talk style was elicited by instructing teachers to produce speech as if they are talking to a NNS learner in language classroom.

During the elicitation task, the high- and low-predictability sentences were

displayed one at a time in random order on a computer screen, with two practice sentences preceding the list of 32 test sentences to allow talkers to become familiar with the task and two filler sentences at the end to avoid list intonation, for a total of 36 sentences. The talkers wore a head-mounted microphone and the speech was recorded using the AUDACITY software in the computer lab at the English Language Institute.

3.3 Procedure

Participants were tested in the ELI computer lab in groups of 5 to 8. Each subject was seated in front of an individual computer monitor and was given headphones. Audio files were played in random order over the headphones at a comfortable listening level using the lab SINAKO sound system. Participants heard two practice sentences produced by a teacher, who did not participate in the test task, and responded to a total of 32 test sentences in random order (16 sentences produced in conversational speaking style and 16 in teacher talk style mixed and randomly presented). Of the 16 sentences in each speaking condition, 4 were produced by each of the 4 talkers, and included 2 high-predictability and 2 low-predictability sentences. Participants were randomly assigned to one of two counterbalancing groups and speaking condition was counterbalanced across groups. Each sentence was played once, and the participant's task was to write the keyword in a sentence-final position on a prepared answer sheet. Following the auditory final keyword transcription task, participants completed a questionnaire about their language learning experience with the target language and language background.

CHAPTER 4

RESULTS

Proportion of sentence-final keywords correct was calculated for all participants in this study, and each participant received a sentence-final keyword accuracy score out of 16 for each of the 2 speaking conditions (conversational speech and teacher talk), which was converted to mean proportion correct. A four-way mixed-design analysis of variance (ANOVA) with level of learner language proficiency (2 levels: high beginners vs. intermediate learners) as a between-subjects factor, and teacher speech type (2 levels: conversational speech vs. teacher talk), talker (4 levels: T1, T2, T3, T4), and sentential context (2 levels: high-predictability versus low-predictability context) as within-subjects factors revealed a significant main effect of speech type, with higher accuracy on teacher talk than conversational speech ($F(1,30)=45.957$, $p< .005$, *partial eta squared*=.605; see Figure 1 and Table 1), a significant main effect of learner language proficiency, with intermediate learners outperforming high beginners ($F(1,30)=19.795$, $p<.005$, *partial eta squared*=.398; see Figure 2), a significant main effect of talker ($F(3, 90) =11.878$, $p<.005$, *partial eta squared*=.284; see Figure 3 and Table 3), and no significant main effect of sentential context ($F(1,30)=1.697$, $p=.203$, *partial eta squared*=.054).

Planned pairwise comparisons following up on the main effect of talker revealed a significant difference in the means between T1 and T2 ($F(1,31)=25.241$, $p<.0005$, *partial eta squared*=.449), with T2 more intelligible than T1, T1 and T4 ($F(1,31)=9.00$,
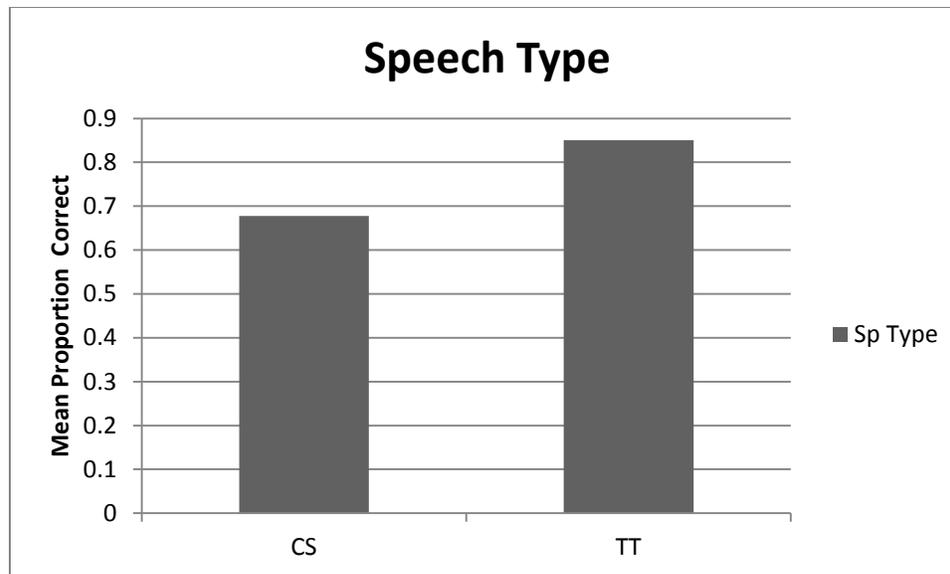
Figure 1.Mean proportion correct by speech type (CS=conversational speech; TT=teacher

talk).

Table 1. Mean proportion correct by speech type.

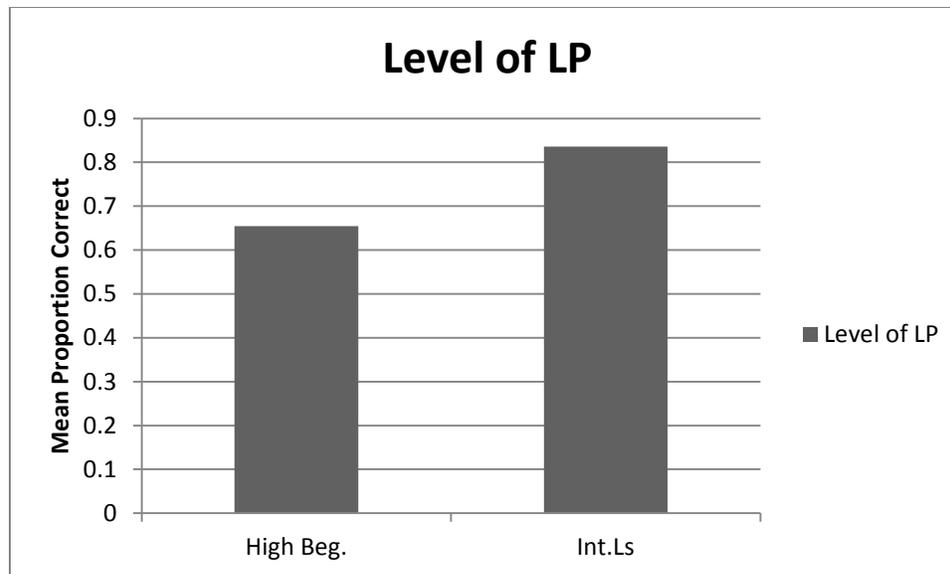| Speech Type	Mean Proportion Correct	Std. Deviation	N
Conversational Speech	.6776	2.70090	51
Teacher Talk	.8505	2.56186	51

Level of LP

Figure 2. Mean proportion correct by learner level (High Beg. = high- beginner; Int.

=Intermediate).

Table 2. Mean proportion correct by learner level (High Beg. = high- beginner; Int.

=Intermediate) and speech type (CS=conversational speech; TT=teacher talk).

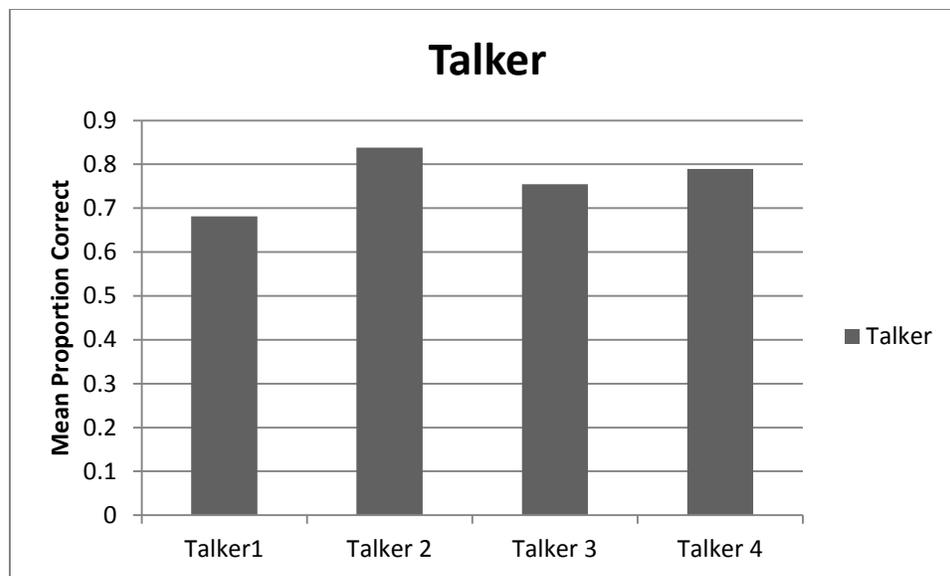| Speech Type	HB Level Mean	HB Level Std. Deviation	Int. Level Mean	Int. Level Std. Deviat.	N
CS	.5546	2.69490	.7460	2.20389	32
TT	.7539	2.71339	.9258	2.16853	32

Figure 3. Mean proportion correct by talker.

Table 3. Mean proportion correct by talker.

Talker	Mean	Std. Deviation	N
T1	.6813	3.8294	51
T2	.8382	4.1488	51
T3	.7549	4.0917	51
T4	.7892	4.1088	51

p<.005, *partial eta squared*=.225), with T4 more intelligible than T1, T2 and T4 (*F* (1,

31) =15.696, *p*<.0005, *partial eta squared*=.336), with T2 more intelligible than T4, and

talkers T2 and T3 (*F* (1, 31) =20.617, *p*<.0005, *partial eta squared*=.399), with T2 more

intelligible than T3. Results revealed no significant difference in the means between

talkers T1 and T3 (*F* (1, 31) =.293, *p*=.592, *partial eta squared*=.009), or talkers T3 and

T4 (*F* (1, 31) =3.492, *p*=.071, *partial eta squared*=.101). Figure 3 presents the results by

talker.

The ANOVA also revealed a significant interaction between speech type and

talker (*F* (3, 90) =6.881, *p*<.005, *partial eta squared*=.185), indicating that the effect of

speech type depended on the talker. Follow-up ANOVAs for speech type indicated that

the means for the four talkers were significantly different for both conversational speech

(*F* (3, 93) =7.135, *p*<.005, *partial eta squared*=.187) and teacher talk (*F* (3, 93) =11.644,

p<.005, *partial eta squared*=.273). Pairwise comparisons further revealed that for

conversational type speech the mean of T2's speech was significantly higher than the

means for T1, T3, and T4 at *p*=.001, *p*=.01, and *p*<.005 respectively [see Figure 4 and

Table 4]. No significant difference was found among T1, T3, and T4 [see Figure 4 and

Table 4]. For teacher talk, the means for T2 and T4 were significantly higher than the

means for T1 and T3. No significant difference was found between T2 and T4 and

between T1 and T3 [see Figure 4, *p*<.005].

A significant interaction was also found between talker and context

(*F*(3,90)=3.943, *p*=.011, *partial eta squared*=.116) suggesting that the effect of talker

depended on the sentential context in which the target words appeared. Two follow-up

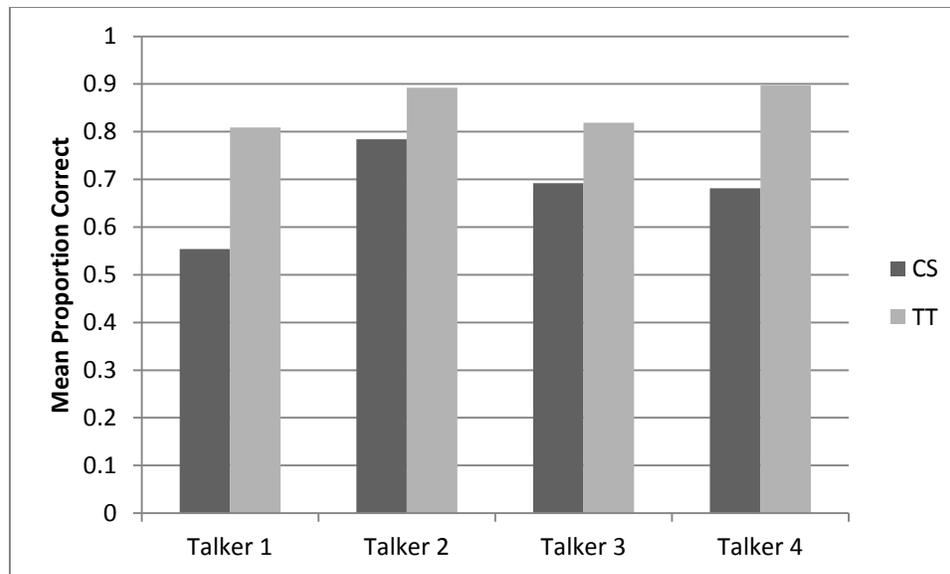one-way ANOVAs for context showed that the means of the four talkers were

Figure 4. Mean proportion correct by talker and speech type.

Table 4. Mean proportion correct by talker and speech type.

Talker	Conv. Speech Mean	Conv. Speech Std. Deviation	Teacher Talk Mean	Teacher Talk Std. Deviation	N
T1	.5539	.52723	.8088	.53506	51
T2	.7843	.44194	.8922	.27266	51
T3	.6912	.60575	.8186	.51563	51
T4	.6814	.39656	.8971	.27633	51

significantly different for both high-predictability context (F (3, 93) =9.081, $p<.005$, *partial eta squared*=.227) and low-predictability context (F (3, 93) =3.988, $p=.010$, *partial eta squared*=.114).

Pairwise comparisons indicated that for high-context the mean for T2 was significantly higher than the means for T1, T3, and T4 at $p<.005$, $p<.005$, and $p=.02$ respectively; also the mean for T4 was significantly higher than the means for T1 and T3 at $p=.007$ and $p=.01$. The means for T1 and T3 were not significantly different when compared [see Figure 5 and Table 5]. For low-context, the mean for T1 was significantly lower than the means for T2 and T3 at $p=.008$ and $p=.04$ respectively. A statistically significant difference was not found between T1 and T4 or between T2, T3, and T4 [see Figure 5 and Table 5].
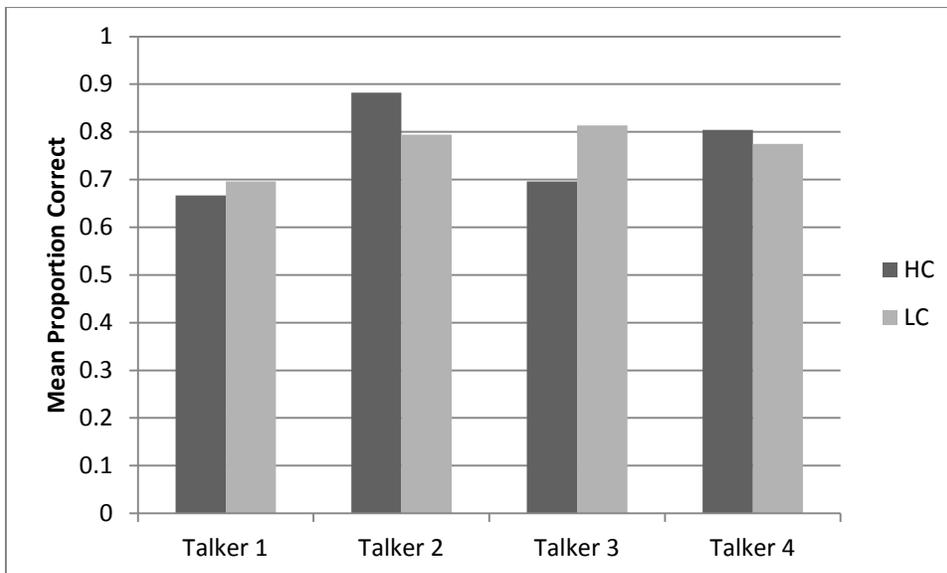

Figure 5. Mean proportion correct by talker and context (HC=high context; LC=low context).

Table 5. Mean proportion correct by talker and context.

Talker	High Context Mean	High Context Std. Deviation	Low Context Mean	Low Context Std. Deviation	N
T1	.6667	.6072	.6961	.7626	51
T2	.8824	.4874	.7941	.5703	51
T3	.6961	.7206	.8137	.6280	51
T4	.8039	.5844	.7745	.6248	51

The ANOVA revealed a significant two-way interaction between talker and level (F (3, 90) =4.524, p=.005, *partial eta squared*=131), suggesting that talker effect may be different for high beginners and intermediate learners. Follow-up one-way ANOVAs for each level of learner proficiency separately revealed a significant effect of talker for both the high-beginner learners (F (3, 45) =10.464, p<.005, *partial eta squared*=.411) and the intermediate learners (F (3, 45) =5.880, p=.002, *partial eta squared*=.282). Pairwise comparisons further revealed that for high beginners, the means for T1 and T3 were significantly lower that the means for talkers T2 and T4, at p=.001 and p=.05 respectively; significant difference was not found when the means for T1 and T3 were compared [see Figure 6 and Table 6]. For intermediate learners the mean for T2 was significantly higher than the means for T1 and T4 at p=.002. No significant difference was found when T1, T3, and T4 were compared or when T2 and T3 were compared [see Figure 6 and Table 6].

The ANOVA also revealed a significant interaction between sentential context and level of language proficiency (F (1, 30) =7.192, p=.012, *partial eta squared*=.193),
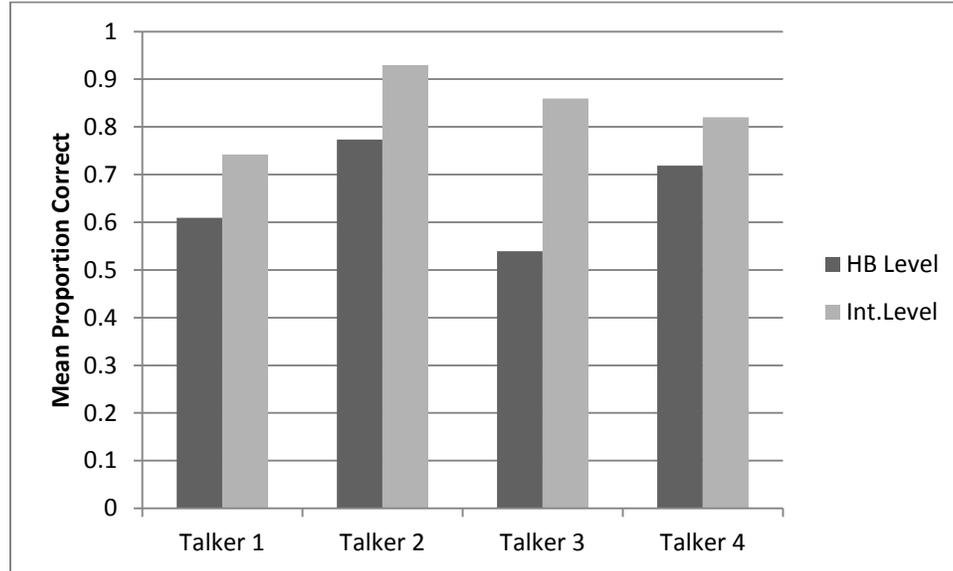
Figure 6. Mean proportion correct by talker and learner level (HB=high beginner; Int. =Intermediate).

Table 6. Mean proportion correct by talker and learner level (HB=High- beginner; Int. =Intermediate).

Talker	HB Level Mean	HB Level Std. Deviation	Int. Level Mean	Int. Level Std. Deviation	N
T1	.6093	.33541	.7422	.15729	32
T2	.7734	.36192	.9297	.35208	32
T3	.5390	.44605	.8594	.32234	32
T4	.7187	.27717	.8203	.20349	32

suggesting that the effect of context depended on whether participants in the study were high beginners or intermediate learners. A simple effects analysis for each proficiency level separately showed that for the high beginners the mean for high context was significantly higher than the mean for low context [p=.02], while for intermediate learners the means for high and low context were not significantly different when compared, p=.278 [see Figure 7 and Table 7].
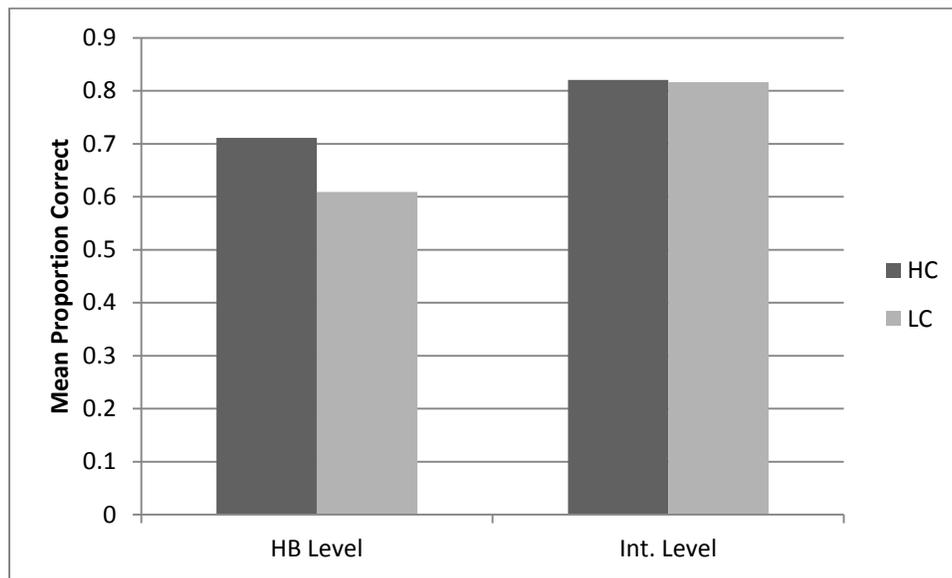

Figure 7. Mean proportion correct by learner level and context.

Table 7. Mean proportion correct by context and learner level (HB=High beginner; Int. =Intermediate).

Context	HB Level Mean	HB Level Std. Deviation	Int. Level Mean	Int. Level Std. Deviation	N
High Context	.7109	2.3502	.8203	1.6676	32
Low Context	.6093	2.5856	.8163	1.5886	32

There was not a significant three-way interaction among talker, speech type and learner proficiency ($F(3,90)$=1.048, p=.374, *partial eta squared*=.034), between talker, speech type and context ($F(3,90)$=1.331, p=.269, *partial eta squared*=.042) or between speech type, context, and level of language proficiency ($F(1,30)$ =2.866, p=.101, *partial eta squared*=.087); however, a significant interaction was found between talker, context, and level ($F(3,90)$=4.633, p=.005, *partial eta squared*=.134). Following up on this interaction, ANOVAs were conducted to examine the interaction of talker and context for the high-beginner and intermediate learners separately. While a significant interaction effect for talker and context was found at high-beginner level (F (3, 45) = 5.715, p=.002, *partial eta squared* =.276), the two-way interaction at intermediate level was not significant. A follow-up analysis for context revealed that effect of talker was significant for both high context (F (3, 93) = 9.081, p<.005, *partial eta squared*=.227) and low context (F (3, 93) =3.988, p=.010, *partial eta squared*=.114) at high-beginner level. Pairwise comparisons indicated that for high-predictability context, the mean for T2 was

significantly higher than the means for T1, T3, and T4, *p*<.005, *p*<.005, and *p*=.02

respectively [see Figure 8]. In addition, the mean for T4 was significantly higher than the

means for T1 and T3, *p*=.007 and *p*=.01, respectively. When T1 and T3 were compared, a

significant difference was not found. For low-predictability context, the mean for T1 was

significantly lower than the means for T2 and T3, *p*=.008 and *p*=.04. No significance

difference was found between T2 and T3, T2 and T4, T1 and T4, and T3 and T4 [see

Figure 8 and Table 8]. Finally, the four-way interaction between speech type, talker,

context, and level of proficiency was not significant (*F* (3, 90) =2.537, *p*=.062, *partial eta
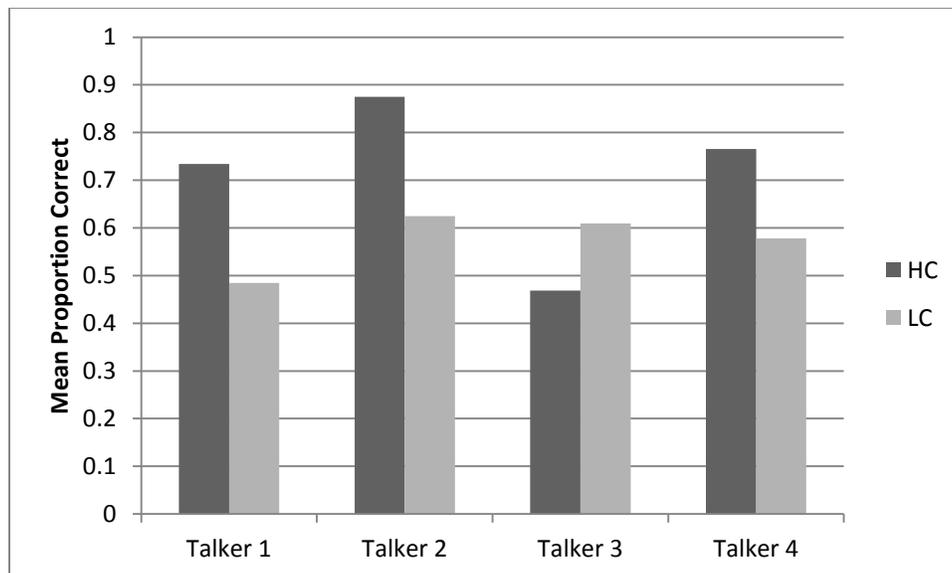
squared*=.078).

Figure 8. Mean proportion correct by talker and context at high-beginner level.

Table 8. Mean proportion correct by talker and context at high-beginner level.

Talker	High Context Mean	High Context Std. Deviation	Low Context Mean	Low Context Std. Deviation	N
T1	.7344	.39015	.4843	.65819	16
T2	.875	.32996	.625	.42951	16
T3	.4688	.63321	.6093	.42121	16
T4	.7656	.41610	.5781	.37968	16

The following is a summary of the main findings reported in this section:

1. Accuracy was significantly higher for teacher talk than conversational speech.

2. Intermediate learners performed more accurately than high beginners.

3. Talker T2 was the most intelligible talker overall.

   a. Talker T2 was the most intelligible talker in the CS condition, and T2 and T4 were the most intelligible talkers in the TT condition.

   b. For high-context sentences, talker T2 was the most intelligible talker; for low-context sentences, the significant talker differences are between T2 and T1 (with T2 more intelligible), and T3 and T1 (with T3 more intelligible).

   c. For high beginners, talkers T2 and T4 were most intelligible; for intermediate learners, T2 was more intelligible than T1 or T4, but not T3.

4. Sentential context did not exhibit a main effect; however, for the high beginners, the high-context was more accurate than low-context; high- and low-context did not

differ for intermediate learners.

Thus the pattern of results in this study shows that sentence-final keyword transcription accuracy improved from conversational speech to teacher talk for nonnative listeners; however, the magnitude of benefit derived from the speech type differed for the different levels of the other factors, namely level of learner proficiency, talker, and context. Although intermediate learners performed more accurately than high beginners in both speaking conditions, the difference between the means for conversational speech and teacher talk at high-beginner level is greater than the difference at intermediate level [see Figure 2]. When presented with TT versus CS, high beginner accuracy improved by 26% while the accuracy for intermediate learners improved only by 20%. For talker, although T2 was the most intelligible talker in both types of speech, context, and both levels of learner proficiency, T1's difference between the means for conversational speech and teacher talk was the greatest among all four talkers [see Figure 4 and Table 4]. Final keyword accuracy increased by 26% for T1, 21% for T4, 12% for T3, and 10% for T2 when these talkers changed their mode of speech from conversational style to teacher talk. This study did not find a significant main effect of sentential context nor a significant interaction between speech type and context; however, although the results showed lack of a context effect for intermediate learners, for the high beginners, the accuracy increased when presented with high-predictability versus low-predictability context in both speaking conditions, conversational style and teacher talk [see Figure 7]. However, their benefit was larger for conversational speech, with 47% accuracy in the low-context condition versus 65% accuracy in highly predictable context than for teacher talk, with 75% accuracy in low-context versus 77% accuracy in high-context.

CHAPTER 5

DISCUSSION

5.1. Speech Type

Recall that the main research question in the present study is: do the phonological modifications made by teachers in their speech to nonnative listeners affect learners' comprehension in L2/FL setting? Results revealed significant main effect in nonnative listeners' performance as measured by their sentence-final keyword accuracy score when they were presented with teacher talk stimuli versus conversational speech stimuli. This indicates that teachers do make adjustments in their speech to NNS learners with regard to the phonological/phonetic structure of their utterances, and also that these adjustments are an effective intelligibility strategy that positively affects nonnative listeners' comprehension. This finding entails that L2 learners benefit from modifications at acoustic-phonetic level made by teachers in instructional setting, and these modifications in teacher talk enhance the intelligibility of the input directed to nonnative learners. However, as in this study teacher talk is investigated from a global approach as speech that has been modified and not dissected into segments representing adjustments at specific language structures, we can only demonstrate whether such modifications exist based on the findings of the study and their effect on nonnative listeners' comprehension. Future research will be needed to examine the actual acoustic-phonetic features of teacher talk and to provide more detailed analyses of the nature of teacher speech to

NNSs and its effects on nonnative comprehension.

As significant difference is found to exist in speaking condition, it might be the case that the rate of speech in teacher talk was slower than the rate of conversational speech although the current study does not provide measure of rate of teacher speech. However, it is also possible that the significant main effect of speech type is due to other adjustments in teacher talk relative to pauses, an expanded range of pitch, and hyperarticulation. Future research might shed more light on the variety of modifications characterizing speech of teachers directed to NNLs.

As previous research has established, if nonnative listeners are exposed to a clear acoustic signal provided by the means of the phonetic/phonological adjustments in teacher talk, they may increase their sentence-final keyword accuracy by taking advantage of the acoustic cues in such modified speech. However, the pattern of results in this study revealed that the magnitude of speech type benefit may differ across various levels of factors such as level of learner proficiency, talker, and sentential context.

5.2 Context

The findings from this study revealed no main effect for sentential context which was in contrast with the results obtained in Bradlow and Alexander's study (2007) that found significant main effect of context, with highly predictive context more accurate than low-predictability context in clear speaking style; however, the data exhibited lack of a context effect in conversational speech for nonnative listeners. Although there was not a significant interaction effect between speech type and context in the present study, the significant interaction between sentential context and level of learner proficiency revealed that while for intermediate learners how- and low- context did not differ, high

beginners were more accurate when presented with high-context versus low-context stimuli in both speaking conditions. Unlike the nonnative listeners in Bradlow and Alexander's study (2007) who only benefitted from high-predictability context in clear speech, NNSs at high-beginner level of competence in this study showed a larger benefit for high-context versus low-context in conversational speech than in teacher talk. This indicates that nonnative listeners may be able to take advantage of enhanced contextual information even when the acoustic-phonetic signal is less favorable, to improve their comprehension of presented listening material. The lack of a context effect for intermediate learners may suggest that due to their higher level of language proficiency, their increased ability to derive benefit from various contextual information affected their performance in both types of context at both levels of speech, conversational and teacher talk.

5.3. Talkers

The findings of this study revealed a significant main effect of talker, consistent with previous research (Dickman, 2009) on speech intelligibility. The significant differences among talkers, with T2 generally being more intelligible than T1, T3, and T4 in both conversational speech and teacher talk, for both high beginners and intermediate learners, and in high- and low-context and T1 as the least intelligible of the four, indicate that in addition to the global adjustments that teachers make in their speech to NNLs, there are individual aspects of talker speech that may enhance the intelligibility of the produced speech. In addition, the significant interaction between speech type and talker indicated the dependence of the speech type effect on the characteristics of the talker. As the results demonstrated, the nonnative final keyword accuracy may be improved by the

natural intelligibility of a talker in not only acoustically favorable speaking conditions such as teacher talk but also in conversational speech. The data also revealed that the magnitude of the effect of the adjustments from conversational speech to teacher talk differs across talkers indicating that although teacher talkers do modify their speech to meet the communicative needs of nonnative learners, these modifications vary due to individual talker factors. Future research might investigate the teacher talker variability and its effect on the NNS comprehension in various speaking conditions.

The significant interaction between talker and context in the data indicated that all talkers but T3 were more intelligible in high-predictability versus low-predictable context; again the most intelligible in both types of context was T2. The significant interaction effect between talker and level of learner proficiency suggested that talker effect was different for high beginners and intermediate learners. High beginners performed better on the auditory transcription task when presented with speech from T2 and T4, even though intermediate learners were more accurate when listening to T2 speech stimuli. This may be due to the natural intelligibility of T2 and T4 combined with their ability to adjust their speech according to NNL communicative needs.

5.4. Level of Learner Proficiency

The findings of this study reveal a significant main effect of learner language proficiency, and it is not a surprise that intermediate learner final keyword accuracy was higher than high-beginner accuracy in both types of speech. However, high beginners benefitted more than intermediate listeners when presented with teacher talk versus conversational speech stimuli as their accuracy increased by 26% compared to 20% for intermediate learners. This finding may be interpreted in light of high beginners' limited

experience with the sound structure of the target language that prevented them from a better performance in conversational speech, but when NNLs were offered a clear acoustic signal by means of teacher talk, they took advantage of this phonetic enhancement by increasing their accuracy score in teacher talk condition. This suggests the importance of using intelligibility strategies at lower levels of learner proficiency in order to improve the comprehensibility of linguistic input produced by teachers in various teaching contexts.

In relation to previous research, one of the main findings in the present study relative to increased nonnative sentence-final keyword accuracy for teacher talk versus conversational speech could be viewed as evidence that teachers modify their speech to NNS learners at the phonological/phonetic level of the language structure, achieving enhanced intelligibility of their utterances. Observed modifications in teacher speech have been reported in Henzl (1973, 1979), Hakansson (1986), Steyaert (1977), Dahl (1981), Wesche and Ready (1985), Mannon (1986), Ishiguro (1986), Chaudron (1982), and Hatch (1983). Even though these studies differed from the present study in a number of ways, perhaps most notably by the fact that they examined a variety of phonological features characterizing teacher talk, such as rate of speech, pauses, pitch, intonation, stress, and articulation of segments rather than adopting a global approach to teacher speech as a phenomenon that has been modified but not decomposed into various altered elements, they both demonstrate that teachers adjust their speech to accommodate nonnative listeners' communicative needs. However, only a small number of studies (Griffiths, 1990; Grosjean, 1972; Kelch, 1985) reported findings relative to the benefit offered by the adjustments in teacher speech to NNLs, who increased their

comprehension when exposed to teacher talk with decreased rate of speech. The results from this study are consistent with these studies' findings as its nonnative participants improved their sentence-final keyword accuracy in the teacher talk condition versus conversational speech.

Although no evidence was found in the previous research about the effect of teacher talker, level of learner language proficiency, and sentential context on the magnitude of teacher speech benefit for NNSs, the pattern of findings in the present study suggests that these factors should be taken into consideration when investigating teacher talk as a strategy for enhancing the intelligibility of linguistic input to nonnative learners. It remains for future research to determine whether natural intelligibility of a talker or talker ability to modify effectively teacher speech would result in greater benefit for NNLs. An open issue to be investigated further is with respect to the role of contextual information in nonnative speech processing strategies when NNSs are exposed to both acoustic-phonetic enhancements from teacher talk or less favorable acoustic signal provided by conversational speech.

5.5. Limitations

One major limitation of the present study emerges from the method of elicitation; in this regard, since the term 'conversational' speech is not clearly defined in literature, and teacher talkers were asked to speak as though talking to 'somebody familiar with their voice and speech patterns' or a NS, a range of variables that are not controlled by the researcher may be introduced and have unknown effects on talkers' production. These variables may include: familiarity with the target listener, varied NS audiences, and personal attitudes accompanying the presented information. Additionally, as second

language learners' population is highly diverse, teaching experience with L2 learners at a particular level of language proficiency may affect teachers' performance when producing speech directed to NNSs in teacher talk condition.

A second limitation arises from the nature of the task employed in the current study and its effects; the measure for nonnative listener comprehension is participants' responses in an auditory sentence-final keyword transcription task. As research has indicated, often language learners' performance is influenced by task type, and it is difficult to generalize NNS performance on a keyword transcription task to other types of tasks (Brindley, 2005) Furthermore, in L2 classroom environment often learners are required to attend to and comprehend longer pieces of teacher discourse which makes recognizing only and comprehending a particular word a small portion of the cognitive load that the NNSs need to handle. As the task includes only sentences with keywords, it presents limits to generalizing the effects of the investigated speaking condition on second language learners' performance in linguistic situation where more demanding oral discourse is available.

5.6. Implications for Language Pedagogy

The major finding of the present study reveals that teachers acoustically and phonologically modify their speech when talking to nonnative learners, and these phonological adjustments affect NNS comprehension significantly. In addition, investigating the role of context relative to nonnative listeners' comprehension sheds more light on how different intelligibility strategies at acoustic-phonetic and semantic-contextual level of speech could complement each other for the benefit of nonnative learners.

Although further research is necessary to augment the findings of this study, the present findings have several important implications for the field of second language teaching. First, teacher preparation programs may find it necessary to include explicit instruction how to produce teacher talk for future ESL/EFL teachers in order to ensure that graduates of the program will be well prepared to produce discourse that provides comprehensible input to L2 learners. Second, teacher materials may address the phenomenon of teacher talk by presenting and describing adjustments at various language levels of speech in order to contribute to development of professional skills and advancement of teacher craft. Third, the findings of the study may be considered by the developers of listening materials and sources, meant to be used in different classroom contexts and with various NNS audiences, in order to adequately meet the needs of NNSs of comprehensible listening materials.

APPENDIX

<u>High-predictability Sentences</u>

1. The color of a lemon is yellow.

2. My clock was wrong so I got to school late.

3. In spring, the plants are full of green leaves.

4. A bicycle has two wheels.

5. She made the bed with clean sheets.

6. The sport shirt has short sleeves.

7. He washed his hands with soap and water.

8. She cut the cake with a knife.

9. The lady wears earrings in her ears.

10. People wear shoes on their feet.

11. A rose is a type of flower.

12. Monday is the first day of the week.

13. The boy laughed because the joke was very funny.

14. To cool her drink, she added a few cubes of ice.

15. The sick woman went to see a doctor.

16. The lady uses a hairbrush to brush her hair.

Low-predictability Sentences

1. Mom thinks that it is yellow.

2. He thinks that it is late.

3. She talked about the leaves.

4. He read about the wheels.

5. Dad talked about the sheets.

6. He looked at the sleeves.

7. We talked about the water.

8. Mom read about the knife.

9. She pointed at his ears.

10. Mom looked at her feet.

11. She read about the flower.

12. This is her favorite week.

13. Dad thinks that it is funny.

14. He talked about the ice.

15. Mom talked about the doctor.

16. He pointed at his hair.

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