Synchronous-Voice Computer-Mediated Communication: Effects on Pronunciation

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ABSTRACT
Communicative competence is the ultimate goal of most learners of a second language and intelligible pronunciation a fundamental part of it. Unfortunately, learners often lack the opportunity to explore how intelligible their speech is for different audiences. Our research investigates whether synchronous-voice computer-mediated communication could be an adequate tool both to promote more authentic interactions and to test the intelligibility of students’ pronunciation with different audiences. We also study whether the kind of dyad (NNS sharing L1, NNS different L1, and NS) affects improvement in pronunciation and amount of phonetically modified output as a result of interactions and investigate whether teachers’ considerations of the seriousness of phonetic errors are confirmed by interlocutors’ incomprehension.

KEYWORDS
Oral Synchronous Computer-mediated Communication, Pronunciation, Communication Breakdowns, Intelligibility

INTRODUCTION
Communicative competence is the ultimate goal of most second language learners in English as a foreign language (EFL) contexts. However, lack of individualized practice, interaction, and instant feedback usually results in insufficient oral skills and poor pronunciation. Oral interaction is generally teacher-centered and, when individualized (in pairs), takes place between students sharing the same L1, and thus communication becomes inauthentic.1 Furthermore, same-L1 NNSs have been reported to notice fewer errors than different-L1 NNSs (Varonis & Gass, 1985)—especially phonetic errors (Long & Porter, 1985)—and to use their L1 to solve communication breakdowns (Smith, 2005). Therefore, they may not provide enough negotiation-of-meaning moves (Long, 1996) so as to produce modified output (Swain, 2005), a process which has been proved to contribute notably to L2 acquisition (Mackey, 1999).

Our research explores pronunciation improvement using synchronous voice computer-mediated communication (SVCMC). Our focus on pronunciation is due to four factors. First, pronunciation is an underexplored area (Derwing & Munro, 2005) and is many times neglected in EFL contexts (Breitkreutz, Derwing, & Rossiter, 2001; Neri, Cucchiarini, & Strik, 2006). Second, research on the effect of interaction using SVCMC with a focus on pronunciation improvement is nonexistent at the moment to the best of our knowledge. Third, a minimum level of intelligibility is necessary for communicative competence (Celce-Murcia, 1987). Finally, students’ intelligibility should be tested with different kinds of partners only available through SVCMC in various EFL contexts.

SVCMC was used because it was considered as the best tool to provide individualized oral and pronunciation practice in open-ended two-way information-exchange tasks2 with immediate
feedback on intelligibility and pronunciation errors caused by phonetic breakdowns in communication and the modified phonetic output they may prompt. It also widened the range of interlocutors available to include NNSs with different L1s and NSs. Moreover, since the interactions were recorded, students would refrain from using their L1 with NNSs with the same L1; negotiation-of-meaning moves would increase and hopefully produce more modified output. Finally, there is a lack of research on students’ linguistic achievement when using SVCMC, and this study should contribute to clarifying its usefulness for SLA in EFL contexts.

This project seeks to explore the capabilities of SVCMC for the development of pronunciation depending on the kind of dyad as it regards pronunciation improvement, number of phonetic errors, number of phonetic breakdowns, and amount of phonetically modified output. To our knowledge, there is no research comparing the effect different kinds of dyad have on pronunciation developments or exploring the linguistic outcomes of students using SVCMC. With increasing numbers of L2 learners using SVCMC because of the possibilities it offers for L2 learning, an exploration of linguistic outcomes may be critical in the SLA field.

LITERATURE REVIEW

Interaction Hypothesis

Interaction is fundamental in language learning; research and practice suggest that successful language learning can only take place when four conditions are present: (a) high-quality input, (b) ample opportunities for practice, (c) high-quality feedback, and (d) individualized content (Zhao, 2005). Authentic interactions with authentic audiences are generally missing in EFL learning contexts, and the urgency in solving this problem is self-evident (Wang, 2004).

In any kind of interaction, there might be breakdowns in communication when the output is incomprehensible for a variety of reasons. Communication breakdowns are even more common when NNSs engage in interaction. The interaction hypothesis maintains that those breakdowns direct the attention of learners to the part of language responsible for the breakdown and result in repair moves related to negotiation of meaning and negative feedback, through which speakers might become aware of the inaccuracy of their speech (Long, 1996; Schmidt, 2001; Gass, 2003). As a result, if learners recognize the different types of negative feedback provided by interlocutors, they may try self-correction in the form of modified output (Swain, 2005; Long, 1996), which has been postulated to contribute notably to second language acquisition (Mackey, 1999).

Output is a necessary condition because it allows learners to compare their own production with the correct input. In pronunciation, this is the first step leading to an understanding of one’s own pronunciation deviations (Neri et al., 2006).

Although the benefits of interaction have been researched for morphosyntactic and lexical improvement (Smith, 2004; Pelletieri, 2000; Foster & Ohta, 2005), only Sicola (2009) has researched “specific evidence of such phonological processing during interaction” (p. 18). However, her research has not dealt with pronunciation improvement, which remains an area to be explored. Our paper tries to fill that gap by studying the effect of interaction in pronunciation improvement to lend support “to the potential applicability of interactionist approaches to investigating L2 pronunciation developments” (Sicola, 2009, p. 17).
Pronunciation and Intelligibility

Pronunciation is essential to communicate orally as there is “a threshold level of pronunciation in English such that if a given non-native speaker’s pronunciation falls below this level, he or she will not be able to communicate orally no matter how good his or her control of English grammar and vocabulary might be” (Celce-Murcia, 1987, p. 5). Research has further illustrated that phonetic errors account for an important number of communication breakdowns and repair moves in interactions between both NSs-NNSs (Jepson, 2005) and NNSs-NNSs (Fernández-García & Martínez-Arbelaitz, 2003; Jenkins, 2000).

Nevertheless, pronunciation has been a marginalized area in SLA (Derwing & Munro, 2005), and its importance has always been determined by ideology and intuitions rather than research (Levis, 2005). Although instruction has been shown as effective in improving both perceptive and productive pronunciation skills (Derwing, Munro, & Wiebe, 1998; Cenoz & García Lecumberri, 1999; Bongaerts, 1999), the time devoted to meaningful pronunciation practice has remained clearly insufficient (Neri et al., 2006). As a solution, authentic tasks involving peers and groups for interaction and feedback so that learners could notice and repair their own and others’ phonetic errors have been proposed (Morley, 1991; Fraser, 1999). SVCMT can aid in the provision of authentic tasks, intensive interaction, and feedback on individual problems by engaging students in interaction with more able peers and thus may contribute to phonetic improvement.

Another problem regarding pronunciation instruction is its focus. Research on attainment reports that native-like pronunciation after early childhood is actually extremely infrequent (Flege, Munro, & Mackay, 1995; Scovel, 2000). A more realistic aim and the actual trend in pronunciation teaching in EFL contexts is intelligibility (Wells, 2005; Neri et al., 2006).

What contributes more to intelligibility has also been questioned. Some authors claim that suprasegmentals have a negative impact on listeners (Hahn as cited in Munro & Derwing, 2006). However, Levis (2005) points out that a segmental focus makes a more important contribution to intelligibility. Jenkins (2002), analyzing interactions between NNSs in the classroom, also concluded that segmentals produced most of the communication breakdowns.

Furthermore, research suggests that learners’ capacity to modify their speech to become intelligible to interlocutors from a wide range of L1 backgrounds might be enough for successful interactions (Jenkins, 2000). However, most research on intelligibility issues has focused on native speakers’ perceptions (Tajima, Port, & Dalby, 1997; Munro & Derwing, 1995; Derwing & Munro, 2005) while “research undertaken in NNS-NNS interaction … is still in its infancy” (Pickering, 2006, p. 220).

A further problem is that since familiarity with an accent improves comprehension (Gass & Varonis, 1984), teachers and researchers may not be the best judges of their own students’ comprehensibility or intelligibility (Munro & Derwing, 2006). In addition, few studies have analyzed speech from classroom interactions, and therefore the need for empirical, replicable studies about intelligibility in classroom settings with different kinds of audiences is clear.

Our study tries to fill two gaps in research. First, it will seek to clarify whether SVCMT is an effective tool for pronunciation development due to the increased interaction and its benefits in terms of noticing and modified output—through negotiation of meaning—with different kinds of partners. Second, it will explore how many phonetic breakdowns, caused by errors perceived as serious by the teacher (who was also the researcher), take place in real interactions as a means of testing whether teachers’ judgments of serious phonetic errors are representative of the judgments of different kinds of interlocutors.
**Kind of Dyad**

Although NSs may be expected to be the most beneficial for SLA, three reported disadvantages of NNS-NS dyads are (a) anxiety, (b) control of the task, and (c) lack of correction. Anxiety seems prevalent in NS-NNS interactions (Lee, 2004), and thus the affective filter may hinder input received (Satar & Özdener, 2008). NNSs also seem to leave control of the task to NSs as experts and so do not get pushed to produce higher levels of language (Gass & Varonis, 1985). Finally, research has shown that NSs tend to ignore a high quantity of NNSs errors (Iwashita, 2003).

On the other hand, research on NNS interaction has generally shown that a greater amount of negotiation occurs between NNS-NNS than between NNS-NS dyads (Varonis & Gass, 1985; Gass & Varonis, 1994; Shehadeh, 1999; Sauro, 2001; Sotillo, 2005) and that the type and amount of both modified interaction and feedback is comparable in both kinds of dyads (Pica et al., 1996; Iwashita, 2003). Nevertheless, Mackey, Oliver, and Leeman (2003) reported a significantly higher amount of negative feedback in adult NS-NNS dyads as compared to adult NNS-NS dyads and both child NS-NNS and NNS-NNS dyads. Their conflicting results could be due to the fact that earlier studies had considered only the overall incidence of negotiation while they reported the negative feedback provided in response to nontarget-like output. However and in support of previous research studies, more opportunities for learners to modify their output were noted in the feedback provided by adult NNSs to NNSs.

Further research on NNS-NNS interactions has concluded that conversations between NNS of different L1 and proficiency level are conducive to a greater degree of repair work (Varonis & Gass, 1985; van Lier & Matsuo, 2000) because dyads of NNS-NNS with the same L1 show a tendency to resort to the use of the native language to solve communicative difficulties (Fernández-García & Martínez-Arbelaitz, 2002; Smith, 2005) and to pronounce English with a greater number of deviations than pairs of speakers from different L1s (Jenkins, 2000). A further disadvantage of NNS-NNS same-L1 dyads seems to be the preliminary finding that NNSs often find understanding an L2 speaker from their own L1 background easier than understanding someone from a different L1 background (Major, Fitzmaurice, Bunta, & Balasubramanian, 2002).

More research on the effect different kinds of dyads (NNS-NNS same-L1 dyads, NNS-NNS different-L1 dyads, and NNS-NS dyads) may have for pronunciation is needed, especially in interactions through SVCMC, to illustrate any possible differences with face-to-face interactions and to test whether any dyad in this new environment is more beneficial for pronunciation.

**Synchronous Voice Computer-Mediated Communication**

Among the many benefits of CMC are the opportunities it offers for individualized instruction, for exposure to different accents, and for interactions with different L1 learners and native speakers of the language, thus the opportunity to use the language to communicate authentically. SVCMC offers the potential to develop students’ speaking skills and to test whether their communicative competence and intelligibility is sufficient to interact successfully. Even though text chat has been compared to face-to-face-interaction and seems to share some of its benefits (Beauvois, 1997; Payne & Ross, 2005), synchronous voice exchanges should resemble even more closely face-to-face communication, especially regarding repair moves, turn adjacency conventions, and discourse coherence structures (Jepson, 2005).

Research on SVCMC has generally compared text and voice chat and has concluded that voice chat technology makes tasks more demanding for learners (Sauro, 2001), produces signifi-
cant gains in oral proficiency (Yang & Chang, 2008; Satar & Özdener, 2008), and offers an environment in which learners are more willing to negotiate for meaning, use a significantly higher number of repair moves (especially pronunciation-related repair moves), and repair their speech more often based on their interlocutor’s hints (Jepson, 2005). Pronunciation has been reported as producing a significantly higher number of repairs (Jepson, 2005) and being the cause of anxiety when students realized their proficiency level was lower than they had thought (Satar & Özdener, 2008).

Our research continues the investigation of the effect that SVCMC has on oral proficiency concentrating on pronunciation gains, a promising area as Jepson (2005) reported that more than half of the self-repetition and explicit correction repair moves and a third of the clarification requests and confirmation checks in his data were directed at pronunciation repair. He concluded that “because of the inherent absence of non-verbal communication and the focus that current voice chat technology places on pronunciation, voice chat may be an optimal environment for pronunciation work” (p. 92).

METHOD

Context

The overall aim of our project was to establish whether different kinds of dyads engaged in SVCMC contributed to phonetic improvement and modified phonetic output in three classes of English for Specific Purposes in Spain. Oral exchanges with three different kinds of dyads were arranged and recorded: NNS-NNS same-L1 (a class of Spanish students interacting among themselves), NNS-NNS different-L1 (a class of Spanish students interacting with a class of Turkish students), and NNS-NS (a class of Spanish students interacting with American students).

The Spanish learners were enrolled in a semester course (45 contact hours over 15 weeks) of English for Specific Purposes for Agriculture. The main objective of the course was the improvement of the students’ proficiency in the four skills, and all the skills were treated in class. The speaking component of the course consisted of six two-way information exchange tasks carried out through Skype. Pronunciation work included five specific lessons on vowels, consonants, and stress in which all the sounds were described and minimal pair drill exercises were carried out perceptively and productively. Some transcription work was also undertaken through matching a phonetic transcription with its corresponding spelling selected from a vocabulary list provided by the teacher.

Further pronunciation work included analyzing the recorded conversations stored on a server and available for the students and submitting identified phonetic errors and their corresponding correction. Feedback on the most problematic phonetic errors in the same interactions was also given later on by the teacher/researcher.

Research Design and Research Questions

Based on a repeated-measures pretest-posttest experimental design, this study sought to compare the pronunciation achievement, the quantity of phonetic errors and phonetic communication breakdowns, and the amount of phonetically modified output of students engaging in SVCMC with NNSs same-L1, NNSs different-L1, and NSs as well as any improvement within the groups from the pretest to the posttest.
The following research questions were formulated for this study:

1. Do SVCMC interactions with different kinds of dyads (NNS-NNS same-L1, NNS-NNS different-L1, or NNS-NS) lead to improvement in pronunciation and, if that is the case, is the improvement different depending on the kind of dyad?
2. Are the number of phonetic errors in the interactions significantly different depending on dyad and test and different from the pre- to the posttest in a specific kind of dyad?
3. Are the number of phonetic communication breakdowns significantly different depending on dyad and test and different from the pre- to the posttest in a specific kind of dyad?
4. Are the number of phonetic errors perceived as serious by the teacher that result in phonetic communication breakdowns significantly different in a specific kind of dyad and test?
5. Are the number of instances of phonetically modified output significantly different depending on dyad and test and different from the pre- to the posttest in a specific kind of dyad?

Participants

The participants in the project were 42 Spanish undergraduates majoring in Agricultural Sciences who were in the last year of their degree program, 14 Turkish students who were preservice teachers of English, and 14 American students who were undergraduates with different majors. All the students were from 20 to 23 years old. The first group had English as a compulsory subject in a Technical Degree in Agriculture, the second were doing a course in Oral Communication in English, and the third studied Spanish as an optional subject.

The proficiency level of the first group was intermediate to advanced as established by a test given at the beginning of the academic term, that of the second group was from upper intermediate to advanced, and the third group consisted of native speakers of English and upper intermediate to advanced speakers of Spanish. The first and the second group had no other contact with English outside the class.

Data Collection Instruments

The first information exchange task of each dyad was considered the pretest and the last the posttest. Fourteen 12-minute pretests and fourteen 12-minute posttests from each group were graded for pronunciation and analyzed by the teacher/researcher. The 10 weeks between the pretest and the posttest was judged adequate for differences to be noticed.

Procedures

Students connected with their assigned partners (a NNS same-L1, a NNS different-L1, or a NS) via Skype, which was installed on every computer, and recorded their conversations with the Pretty May Voice Plug-in for Skype. The dyads were selected in order to get mixed-level pairs in Group 1 (NNS-NNS same-L1) but not in Groups 2 (NNS-NNS different-L1) and
3 (NNS-NS), which matched randomly. Six synchronous voice chats took place in each kind of dyad, and the partners remained the same in the pretest and the posttest in each group.

The first voice chat and pretest was an open-ended two-way information exchange task about college life, and students had to complete some questions about their partners’ academic courses, their lives at the university, and education in their countries. The last voice chat and posttest was an open-ended two-way information exchange task, and students selected their own questions from one of three topics preselected by the teacher in Conversation Questions for the ESL/EFL Classroom (see http://iteslj.org/questions).

All the synchronous voice chats were stored in a server and 84 conversations (14 pretests and 14 posttests from each group) were rated and analyzed by the teacher/researcher.

First, the 12-minute pre- and posttests were rated on a 5-point Likert scale (1 = full intelligibility and high accuracy, 2 = full intelligibility and good accuracy, 3 = partial intelligibility and partial accuracy, 4 = limited intelligibility and low accuracy, 5 = unintelligible) used to assess the following aspects of pronunciation:

1. vowel sounds;
2. consonant sounds;
3. word stress;
4. sentence stress and rhythm, weak forms;
5. intonation; and
6. overall intelligibility (rated 1 = fully intelligible ... 5 = unintelligible).

Each pronunciation aspect was scored separately and the scores totaled, so the maximum score for the test was 30 points.

Second, the pre- and posttests were analyzed and coded to count the number of

1. errors,
2. phonetic errors,
   only segmental and stress placement errors judged as deviant enough to hamper communication (Jenkins, 2002), for example, /aɪdɪə/ pronounced /ɪdea/
3. communication breakdowns,
   any turn in the conversation when an interlocutor signaled incomprehension of the language and made a repair move, for example, A: “What “asignatures” (for “subjects”) have you got in your “career” (for “degree”)?” B: “Sorry. Can you repeat that?” (lexical breakdown)
4. phonetic communication breakdowns, and when the breakdown happened due to a phonetic error and the interlocutor signaled incomprehension of that pronunciation, for example, A: “I /rɪˈself/ (for /rɪˈsiːv/) a good grade” B: “Sorry? a good grade what?”
5. phonetically modified output.
   output that was phonetically modified due to interlocutor’s negotiation moves following a phonetic communication breakdown

A second rater scored and coded 21% of the exchanges (3 pretests and 3 posttests). An inter-rater reliability coefficient of 0.87 was reached for those data.
Data Analysis

First, the mean and standard deviation were computed, and, because the data were found to be parametric (having a normal distribution using the one-sample Kolmogorov-Smirnov distribution test), a one-way ANOVA was performed to see if the difference among groups was significant for any of the scores. A t test for related samples was also run to see if the difference within groups was significant.

Second, the frequency of errors, phonetic errors, communication breakdowns, phonetic breakdowns, and phonetically modified output in both tests were recorded and the numbers added to determine the total number of occurrences in each kind of dyad. The percentages of phonetic errors, phonetic communication breakdowns, and phonetically modified output with respect to the total number of errors, communication breakdowns, and phonetic errors, respectively, were also calculated. Since the data were found to be parametric, one-way ANOVA tests were performed for phonetic errors, phonetic communication breakdowns, and phonetically modified output in the pretest to see if there was any significant difference among the dyads. The same procedure was followed for the posttests. The three factors were set as the dependant variables in both analysis and the kind of dyad as the independent variable. A post hoc analysis (Sheffé) was performed for all significant differences.

Third, t tests for related samples were run for each of the three variables in both tests in search of significant differences within groups for phonetic errors, phonetic breakdowns, and phonetically modified output.

RESULTS

Pronunciation Achievement

All the groups showed improvement in pronunciation performance from the pretest to the posttest, and the relatively small standard deviations suggest a more homogenous level in the three groups (see Table 1).

<table>
<thead>
<tr>
<th>Group 1 (NNS-NNS same-L1)</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>(n = 14)</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td></td>
<td>18.214</td>
<td>4.458</td>
</tr>
<tr>
<td>Group 2 (NNS-NNS different-L1)</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>(n = 14)</td>
<td>16.000</td>
<td>4.224</td>
</tr>
<tr>
<td>Group 3 (NNS-NS)</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>(n = 14)</td>
<td>19.357</td>
<td>5.257</td>
</tr>
<tr>
<td>Total</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>(N = 42)</td>
<td>17.857</td>
<td>4.766</td>
</tr>
</tbody>
</table>

ANOVA results showed that the difference among groups was not significant for score either on the pretest ($F = 1.872, p = .167$) or on the posttest ($F = 1.305, p = .283$), so the distribution was regular in all the groups. The mean improvement was significant in all the groups: Group 1 ($t = -5.380, p = .000$), Group 2 ($t = -6.638, p = .000$), and Group 3 ($t = -2.847, p = .014$). The greatest improvement occurred in Group 2 (2.85) followed by Group 1 (2.29) and Group 3 (1.57). Therefore, Groups 2 and 1 appeared to be more beneficial for pronunciation improvement.
**Phonetic Errors**

**Between groups**

The proportion of phonetic errors to the total number of errors was high (see Table 2). Phonetic errors represented nearly half of all errors in both the pretest and posttest, except for Group 3 (32.27%) in the posttest.

<table>
<thead>
<tr>
<th></th>
<th>Number of errors</th>
<th>Phonetic errors</th>
<th>Percent of phonetic errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>NNS-NNS same-L1 pretest</td>
<td>728</td>
<td>391</td>
<td>53.71%</td>
</tr>
<tr>
<td>NNS-NNS same-L1 posttest</td>
<td>375</td>
<td>157</td>
<td>41.87%</td>
</tr>
<tr>
<td>NNS-NNS same-L1 total</td>
<td>1,103</td>
<td>549</td>
<td>49.77%</td>
</tr>
<tr>
<td>NNS-NNS different-L1 pretest</td>
<td>442</td>
<td>188</td>
<td>42.53%</td>
</tr>
<tr>
<td>NNS-NNS different-L1 posttest</td>
<td>330</td>
<td>149</td>
<td>45.15%</td>
</tr>
<tr>
<td>NNS-NNS different-L1 total</td>
<td>772</td>
<td>336</td>
<td>43.52%</td>
</tr>
<tr>
<td>NNS-NS pretest</td>
<td>282</td>
<td>118</td>
<td>41.84%</td>
</tr>
<tr>
<td>NNS-NS posttest</td>
<td>375</td>
<td>136</td>
<td>32.27%</td>
</tr>
<tr>
<td>NNS-NS total</td>
<td>657</td>
<td>254</td>
<td>38.66%</td>
</tr>
</tbody>
</table>

Both in the pre- and posttest, the highest number of this kind of error occurred in Group 1 followed by Group 2 and Group 3. The difference was statistically significant ($F = 9.381, p = .000$) between Groups 1 and 2 (Dif = 14.56, $p = .013$) and between Groups 1 and 3 (Dif = 19.52, $p = .001$) in the pretest but not significant in the posttest ($F = 0.435, p = .650$).

Proportionally, with respect to the total number of errors, Group 1 produced the highest proportion of phonetic errors followed by Groups 2 and 3 in the pretest, and Group 2 followed by Groups 1 and 3 in the posttest.

**Within groups**

From the pretest to the posttest, phonetic errors decreased significantly in groups 1 ($t = 2.994, p = .010$) and 2 ($t = 2.740, p = .017$), but the reverse happened in Group 3 ($t = -2.277, p = .040$). However, compared to the total number of errors, they decreased in Groups 1 (42%) and 3 (36%) and increased in Group 2 (45%).

**Phonetic Breakdowns**

**Between groups**

In the pretest, Group 2 had the highest number of phonetic communication breakdowns followed by Groups 3 and 1 (see Table 3). Proportionally, with respect to the total number of communication breakdowns, Group 3 had the most (57%) followed by Groups 2 (45%) and 1 (17%). ANOVA results indicated a significant difference in the number of phonetic breakdowns ($F = 7.224, p = .002$) between Groups 1 and 2 (Dif = 2.4469, $p = .003$) and between Groups 2 and 3 (Dif = 1.7029, $p = .046$).
Table 3
Number of Communication Breakdowns, Number of Phonetic Breakdowns, and Percentage of Phonetic Communication Breakdowns

<table>
<thead>
<tr>
<th></th>
<th>Number of communication breakdowns</th>
<th>Number of phonetic communication breakdowns</th>
<th>Percent of phonetic communication breakdowns</th>
</tr>
</thead>
<tbody>
<tr>
<td>NNS-NNS same-L1 pretest</td>
<td>101</td>
<td>18</td>
<td>17.82%</td>
</tr>
<tr>
<td>NNS-NNS same-L1 posttest</td>
<td>41</td>
<td>23</td>
<td>56.09%</td>
</tr>
<tr>
<td>NNS-NNS same-L1 total</td>
<td>142</td>
<td>41</td>
<td>28.87%</td>
</tr>
<tr>
<td>NNS-NNS different-L1 pretest</td>
<td>117</td>
<td>53</td>
<td>45.30%</td>
</tr>
<tr>
<td>NNS-NNS different-L1 posttest</td>
<td>101</td>
<td>44</td>
<td>43.56%</td>
</tr>
<tr>
<td>NNS-NNS different-L1 total</td>
<td>218</td>
<td>97</td>
<td>44.50%</td>
</tr>
<tr>
<td>NNS-NS pretest</td>
<td>49</td>
<td>28</td>
<td>57.14%</td>
</tr>
<tr>
<td>NNS-NS posttest</td>
<td>72</td>
<td>40</td>
<td>55.56%</td>
</tr>
<tr>
<td>NNS-NS total</td>
<td>121</td>
<td>68</td>
<td>56.20%</td>
</tr>
</tbody>
</table>

The number of phonetic breakdowns followed the same pattern in the posttest, Group 2 experienced the highest number followed by Groups 3 and 1, and the difference was significant \((F = 3.450, p = .042)\). Proportionally, Group 1 had the highest proportion (56%) followed by Groups 3 (55%) and 2 (43%).

Within groups

Phonetic communication breakdowns from pretest to posttest increased for Groups 1 and 3 and decreased for Group 2. However, proportionally, with respect to the total number of communication breakdowns, phonetic communication breakdowns increased for Group 1 from 17% to 56% but decreased slightly for Groups 2 (45% to 43%) and 3 (57% to 55%). T-test results showed a significant decrease for Group 3 only \((t = -2.641, p = .020)\).

Phonetic Breakdowns and Phonetically Modified Output

The number of phonetic breakdowns and phonetically modified output was quite low in proportion to the total number of phonetic errors perceived as serious by the teacher (see Table 4). In contrast, the number of phonetically modified outputs was extremely high compared to the number of phonetic breakdowns.
Table 4
Number of Phonetic Errors Perceived by the Teacher, Number of Phonetic Communication Breakdowns, Percentage of Phonetic Communication Breakdowns to the Number of Phonetic Errors, Number of Phonetically Modified Outputs, Percentage of Phonetically Modified Outputs to the Number of Phonetic Errors, and Percentage of Phonetically Modified Outputs to the Number of Phonetic Communication Breakdowns

<table>
<thead>
<tr>
<th></th>
<th>Number of phonetic errors</th>
<th>Phonetic communication breakdowns</th>
<th>Phonetically modified outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
</tr>
<tr>
<td>NNS-NNS same-L1 pretest</td>
<td>391</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
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<td>NNS-NS posttest</td>
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<tr>
<td>NNS-NS total</td>
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Note. percent<sup>a</sup> = percent of modified outputs to the number of phonetic errors, percent<sup>b</sup> = percent of modified output to phonetic communication breakdowns

Between groups

In the pretest, the amount of phonetically modified output was the highest in Group 2 followed by Groups 3 and 1 and was significantly different (F = 4.0280, p = .026) only between Groups 1 and 2 (Dif = 2.3467, p = .026).

As mentioned previously, the proportion of phonetic errors which produced phonetically modified output was low. The lowest proportion occurred in Group 1; only 3% of all phonetic errors were corrected and only 4% had produced a communication breakdown. The proportion was substantially higher in Groups 2 and 3. The former modified 24% of all phonetic errors and had 28% breakdown errors, and the latter 24% modified output and breakdown errors. However, the proportion of phonetic breakdowns which produced phonetically modified output was very high ranging from 100% in Group 3, to 85% in Group 2 and 66% in Group 1.

In the posttest, Group 2 also produced the most phonetically modified output followed by Groups 3 and 1, and the difference was significant (F = 12.577, p = .000) both between Groups 1 and 2, and Groups 1 and 3 (Dif = 2.8885, p = .000; Dif = 1.9430, p = .008), respectively).

Nevertheless, in the posttest, a lower proportion of phonetic errors resulted in phonetically modified output, although more instances of phonetic communication breakdowns had occurred in all groups. Group 1 modified 1% of its phonetic output but had 14% phonetic communication breakdowns, Group 2 modified 28% of its phonetic output and had 29% phonetic communication breakdowns, and Group 3 modified 21% its phonetic output and had 29% phonetic communication breakdowns. The proportion of phonetic breakdowns which produced phonetically modified output was also high, but a bit lower than in the pretest: 95% in Group 2, 72% in Group 3, and a mere 9% in Group 1.
Within groups

T-test results evidenced no significant difference in the amount of phonetically modified output within any of the groups from the pretest to the posttest.

DISCUSSION

Research Question 1: Pronunciation Achievement

Our first question was whether SVCMC interactions with different kinds of dyads produced pronunciation improvements. The answer to that question is affirmative; SVCMC contributed significantly to improvements in pronunciation in all dyads. Improvement might probably be the logical consequence of more time speaking than would have been possible in the regular classroom. Furthermore, all groups experienced improvements despite the lack of face-to-face oral interaction in class as the speaking component of the course was the six oral voice chats. Consequently, SVCMC may contribute most notably to courses in which the possibility of face-to-face contact is lacking such as distance language courses.

This result should have been expected due to the profile of the students. The majority of the students in this technical degree had had no contact with English for 2 or 3 years before they started the course. However, all of the students had passed an intermediate proficiency university entrance exam, so, after 15 weeks, improvement was high as they had recovered their previous level of L2 proficiency. Another possible explanation for the improvement is the increased amount of individualized practice, the phonetic negotiation of meaning, and the subsequent phonetically modified output this tool forces students to produce while interacting with others.

The first research question also explored whether pronunciation improvement would be different depending on the dyad. In this project, the greatest improvement happened in Group 2 followed by Group 1. This finding calls into question the claim that NNS-NS dyads are more beneficial for pronunciation than NNS-NNS dyads because they provide a perfect model. According to our results, NNS-NNS different-L1, and even NNS-NNS same-L1 dyads, experienced a higher degree of pronunciation improvement.

Research Question 2: Phonetic Errors

The second research question explored whether the number of phonetic errors was different depending on kind of dyad and test. We must conclude that the number of phonetic errors does in fact depend on the dyad and test. Group 1 produced a significantly higher number of errors in the pretest. The extraordinarily high number of both general errors and phonetic errors of this group in the pretest could be accounted for by the fact that both sets of speakers had started English instruction recently so both of them made quite a lot of mistakes which decreased as the course proceeded. In fact, by the end, their mistakes had decreased by half from the beginning. Groups 2 and 3 had conversations with more advanced speakers who obviously made a smaller number of mistakes.

The finding that phonetic mistakes represented a very high proportion of all errors ranging from more than half in the pretest in Group 1 to more than a third in the posttest in Group 3 underscores the importance of pronunciation in language teaching; the majority of the mistakes made by students seemed to be related to phonetics, and the number of errors remained stable over time. This finding confirms previous findings on the importance of pronunciation for successful interaction (Jenkins, 2000).
The fact that the number of phonetic errors was not statistically significant between Groups 2 and 3 in the pretest and among any of the dyads in the posttest points to a high and stable number of phonetic errors in the interlanguage of the students, probably indicating that some of the phonetic errors perceived as serious by the teacher/researcher did not produce breakdowns in communication and, because they were not perceived as errors, were not modified.

The number of phonetic errors was significantly lower in the posttest for Groups 1 and 2 and significantly higher for Group 3. This finding seems to corroborate Jenkins' statement: "given the opportunity to engage in NNS-NNS interactions, learners become aware of the features of their own pronunciation systems which are liable to be unintelligible for other L1s and endeavour to adjust them" (2002, p. 95) and points to the success of SVCMC interactions in improving pronunciation. The conflicting results in Group 3 can be explained by the fact that only the NNSs in those dyads made errors in the pretest and because the posttest covered general topics more likely to contain unknown vocabulary than the pretest. Students might have also taken greater risks in making mistakes, and, as Jenkins (2002, p. 91) suggests, "in situations of processing overload NNSs are liable to make more pronunciation errors." The fact that the three groups ended up with about the same number of errors seems to suggest improvement in both listening and speaking skills.

**Research Question 3: Phonetic Breakdowns**

The third research question enquired whether the number of phonetic breakdowns was different depending on the dyad and test and different from the pretest to the posttest in a specific kind of dyad. The answer to this question is positive because both the kind of partner and test influenced the number of phonetic breakdowns in communication.

In the pretest, Group 2 experienced significantly more phonetic communication breakdowns than the other groups. This difference regarding comprehension can be a consequence of the fact that both the NNSs sharing L1 and the NSs were familiar with the L1 of their partners, so intelligibility of deviant forms could well have been expected to be higher, especially in the pretest. However, since NNSs with a different L1 were not familiar with the L1 of their partners, any phonetic deviation from their own variety should have been deemed as unintelligible.

In the posttest, the only significant difference was that Group 2 experienced more phonetic breakdowns than Group 1. Consequently, although there was no significant difference between Groups 2 and 3 or between Groups 1 and 3, Group 2 seemed to have more opportunities for phonetic negotiation of meaning and, thus, for phonetically modified output than the other two groups in both the pretest and the posttest.

Another interesting finding is that phonetic breakdowns increased in the posttest instead of decreasing in both Groups 1 and 3. This might seem contradictory because communication should improve as the partners adjust their speech and pronunciation to be understood by their interlocutors (Jenkins, 2002). However, a possible explanation could be that the pretest involved a topic familiar to students, while the topic of the posttest was more general and more likely to contain unknown vocabulary. Another explanation may be that because students were more familiar with each other, they were probably less anxious to correct or to point out errors in their partners’ speech and consequently an increase in the amount of phonetic breakdowns should be expected, especially in Groups 1 and 3. This might also explain the significant difference from the pretest to the posttest in Group 3.
In the case of Group 2, the decrease in phonetic breakdowns might be due to the fact that the process of adjustment Jenkins (2002) mentioned had already taken place. On the one hand, the Spanish students could have been more careful with their pronunciation, and, on the other hand, their partners had become somehow accustomed to their accent. These data support the fact that “what seems to happen in NNS-NNS interactions is that instead of converging on each other’s pronunciation, when intelligibility is particularly important, speakers converge on what they construe as a more target like pronunciation” (Jenkins, 2002, p. 92).

We might conclude that phonetic breakdowns account for around 50% of communication breakdowns in all kind of dyads. This finding supports previous findings which report that pronunciation issues comprise the biggest source of loss of comprehensibility or intelligibility (Jenkins, 2000; Suzuki, 2004) and provides evidence for a stronger focus on pronunciation in classroom instruction. Furthermore and in light of our results, engaging students in EFL contexts in conversations with NNSs with a different L1 can be equally or more beneficial than engaging them with NSs or NNSs with the same L1. The data in this project showed that a high number of phonetic errors produced communicative breakdowns, a fact which may be conducive to noticing and modified output. As an added benefit, engaging our students in interaction with NNSs may produce a reduction of anxiety levels and thus a lowering of the affective filter (Satar & Özdener, 2008).

**Research Question 4: Relative Gravity of Errors**

The fourth question was whether the number of phonetic errors perceived as serious by the teacher and that result in communication breakdowns are different in a specific kind of dyad and test. Phonetic mistakes represented about half of the mistakes Spanish learners made in SVCMC interactions. However, only about a third of the mistakes judged as serious by the teacher produced phonetic breakdowns, and only in Groups 2 and 3.

On the one hand, the results in this project confirm those of other researchers (Lyster, 1998; Mackey et al., 2000; Bitchener, 2004), who postulate that NNS-NNS same-L1 dyads perceive fewer phonetic errors due to their familiarity with the language; Group 1 perceived the fewest phonetic errors of all the groups. On the other hand, our findings also lend support to previous findings which show that many errors in talk go uncorrected (Hutchby & Wooffitt, 1998). This seems to support Jenkins’ (2006) claim that some phonetic errors in which teachers spend lots of time might be irrelevant for intelligibility. It also suggests that teachers’ intuitions about the intelligibility of their students might not be as accurate as expected and that indeed “more attention should be focused on the mutual intelligibility of NNSs of English. This is particularly important at a time when English is increasingly used as a lingua franca around the world” (Derwing & Munro, 2005, p. 392).

The results for this research question highlights the fact that phonetic errors might not be as severe as teachers judge them to be in actual interaction and that teachers might not be the best judges of intelligibility in real interactions. Further research is needed on which phonetic errors actually produce phonetic breakdowns in real communicative contexts.

**Research Question 5: Phonetically Modified Output**

The last question was whether the amount of phonetically modified output was different depending on the kind of dyad and test and different from the pretest to the posttest. The answer to this question is positive with respect to the kind of dyad but negative with respect to the difference from the pretest to the posttest.
The kind of dyad influenced the quantity of phonetically modified output. The amount of phonetically modified output in Group 1 stands out as very small compared to that of the other two groups. This amount was higher for both Groups 2 and 3 and the difference between them was not statistically significant. Consequently, it may be deduced that both NNSs of different L1s and NSs can successfully contribute to improvements in pronunciation through the pushed phonetically modified output their interaction provokes.

Group 1 was the least beneficial for pronunciation because the number of phonetically modified forms resulting from communication breakdowns was the lowest; NNS-NNS same-L1 dyads perceived fewer phonetic errors than both NNS-NNS different-L1 and NNS-NS dyads. We have to agree with Bygate (1988, p. 76), who observed that pairing students sharing the same L1 “at least allows and at worst encourages fossilization and the use of deviant L2 forms.”

The majority of phonetic breakdowns in communication in Groups 2 and 3 produced modified output ranging from 73% to 100%, which seems to contradict previous studies which reported that only about a third of interlocutor repair moves lead to speaker repair (Nassaji, 2007; Lyster & Mori, 2006). This suggests that negotiation of meaning based on pronunciation seems to be easier to notice and that pronunciation is an area more likely to benefit from real interactions. Even though the number of phonetic errors which resulted in modified forms may seem low (about a third of the total number of errors), phonetic instruction using SVCMC in classroom settings should be considered as very effective in providing individually modified output both because of the high quantity of modified output following communication breakdowns and because the more target-like forms produced have also been reported to be retained after 12 weeks (Bitchener, 2004).

The lack of any significant difference in phonetically modified output in any of the groups from the pretest to the posttest might signal the difficulty of modifying one’s own pronunciation or the difficulty in identifying errors.

LIMITATIONS AND FURTHER RESEARCH

A limitation to this study might be the fact that the NSs also knew the L1 of their partners. Some of the results, especially regarding intelligibility, might have been different had the NSs not known the L1 of their partners. However, it should be borne in mind that the majority of NSs willing to initiate voice chats with learners of their language are students learning their partners’ language so this research has been carried out with the most likely partners for those interactions. The type of negotiation move used in this kind of situation was beyond the scope of this study, and further research is needed in that area.

CONCLUSION

From our data, we can conclude that SVCMC is beneficial for pronunciation because it provides enough breakdowns in communication through which students can notice the gaps in their current phonetic interlanguage and thus produce phonetically modified output.

This study has shown that the kind of dyad affects pronunciation improvement and that NNS-NNS different-L1 dyads appear as the most beneficial for pronunciation development—both in achievement and instances of modified output—followed by NNS-NS dyads and NNS-NNS same-L1 dyads. Whether NNS-NNS different-L1 dyads also contribute the most to other kinds of modified output such as lexical or morphosyntactic output in SVCMC interaction is a promising area for future research.
This study also contributes to demystifying the native speaker fallacy which posits NSs as the best interlocutors and models for language learning. At least for pronunciation improvement this does not seem to be case; in the project described here, higher improvement in pronunciation occurred in NNS-NNS different-L1 and NNS-NNS same-L1 dyads, and both may have also contributed to reducing anxiety levels and providing more opportunities for self-repair.

Further, both NNS-NNS different-L1 dyads and NNS-NS dyads led to equally high numbers of phonetically modified output, higher than that of NNS-NNS same-L1 dyads. As a result, teachers should be encouraged to promote interaction with NNS-NNS different-L1 dyads using SVCMC since they have been shown as the most beneficial in pronunciation achievement, phonetic breakdowns in communication, and phonetically modified output, much more so than the typical arrangement in EFL classrooms with NNS-NNS same-L1 communication.

NOTES

1 In contexts in which all students share the same L1, communication is always inauthentic because learners know they would communicate best in their L1 (Zhao, 2005).

2 Pica, Lincoln-Porter, Paninos, and Linnell (1996) and others have argued that closed two-way exchange information gap tasks are more conducive to negotiation of meaning. However, other authors found no difference depending on the kind of task (Bitchener 2004), reporting that the difference was due to kind of grouping (group vs. dyad) more than to open-ended or closed tasks, that the distribution of negotiation and c-units was uneven and depended on individuals (Foster, 1998; Eckerth, 2009), and that unstructured conversation was more challenging for students (Nakahama, Tyler, & van Lier, 2001). Consequently, we chose open-ended tasks because they were judged to be closer to real-life conversations and therefore closer to our students’ future needs.

3 This is the most pressing need expressed by our students, who report avoiding contact with foreigners because of lack of confidence and practice in oral skills.

4 In same L1 classes “there appears to be a minor advantage to intelligibility (Munro, Derwing, & Morton, 2006), thus students ... may have a somehow skewed impression of how clear their speech actually is” (Derwing, 2008, p. 356).

5 Communication breakdowns were coded as follows:

(a) lexical communication breakdown, for example, A: “What “career” are you studying?” B: “Career? What is “career”?

(b) morphosyntactic breakdown, for example, A: “And people run a lot of?” B: “people run what?”

(c) phonetic, for example, A: Which /sʌbdʒektz/ (for /sʌbdʒɪkts/) do you study?” B: “Which what? Can you repeat please?”

(d) general, for example, A: “We aren’t /bə:səs/ (for /lu:zaiz/) during the time” B: “Sorry?”

6 Researchers such as Bitchener (2004) and Mackey, Perdue, and McDonough (2000) have also reported that the amount of phonological negotiation of meaning is smaller in pairs sharing the same L1, so intelligibility is higher when the L1 is known and familiar to the interlocutor.

7 Research has reported mostly what happens with morphosyntactic errors following focus on form. Consequently, the proportion of interlocutor repair moves related to pronunciation which produced modified output is unknown. Mackey et al. (2000) studied the perception of students with respect to the type of feedback and concluded that the majority of phonological episodes (60%) were perceived as being about phonology.
As already mentioned, Mackey et al. (2000) reported a high number of pronunciation-related episodes which were recognized as being about phonology, and Bitchener (2004) found that most phonetic negotiation ended up in a target-like form.

REFERENCES


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