The effect of prosody instruction in developing listening comprehension skills by interpreter trainees: does methodology matter?

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Abstract

In the present study, three groups of interpreter trainees were formed, two experimental groups, i.e., blended prosody instruction (BPI) and computer-assisted prosody training (CAPT), and one control group (CON). In this experiment the participants took part in a four-week teaching program for 16 sessions (60 minutes per session), i.e., 16 hours in all. The participants were native Persian speakers who studied English interpreting at the BA level in Iran. The control group listened to authentic audio tracks or watched authentic English movies, discussed their contents, and did exercises based on these tasks for developing listening comprehension skills during the full 16 hours. The CAPT group spent one-third of the time (320 minutes) instead on prosody training using Accent Master Software. The BPI group did this for only 160 minutes but spent the other 160 minutes on theoretical explanations of prosody, and did practical exercises with prosodic structures supervised by an expert human instructor. Students then took a posttest in listening comprehension skills. The results revealed that the BPI group outperformed the other groups in developing listening comprehension skills. This conclusion may have pedagogical implications for interpreter training programs, foreign language instructors, and interpreting practitioners.

Keywords: CAPT; BPI; prosody training; interpreter trainees; listening comprehension skills

1. Introduction

1.1 The importance of listening comprehension for interpreting

Interpreting is the immediate translation of speech from one language to another. The interpreter mediates between a sender and a receiver who do not understand each other's language. The interpreter listens to speech in the sender's language, and then produces a semantic equivalent in the receiver's language, either while the sender continues to speak (simultaneous interpreting) or alternating with the sender (consecutive interpreting). When the receiver responds, the roles of receiver and sender are reversed. The first stage in the interpreting process, then, is that the interpreter listens and understands the meaning and intentions of the input speech produced by the sender.

Most interpreters have one native language, and learned a second language later in life, often in a supervised learning environment, i.e., a school or university. Interpreting from the nonnative language into the interpreter's native language is called direct or *recto* interpreting. The reverse direction, i.e., interpreting from the native language into the foreign language, is called *verso* interpreting. Understanding the sender is an effortless, automatized process for the interpreter in the *verso* direction, where the major difficulty is in the formulation and articulation of the rendition in the nonnative language. Understanding the sender is a challenge, and a potential source of communication breakdown, in *recto* interpreting. It is of great importance, therefore, that student interpreters develop excellent listening comprehension skills in their nonnative languages.

In our work, we are interested in improving the quality of interpreting between Persian and English by Iranian students of interpreting, i.e., with Persian as the native language and English as the foreign language. Earlier results have shown that the interpreting quality improved significantly when a relatively small portion of the instruction time was devoted to the explicit teaching of the differences between the sound systems of Persian and English (Yenkimaleki & Van Heuven, 2018). We developed a series of instruction modules that target the segmental structure (i.e., the differences in vowels, consonants, and syllable structure, see Yenkimaleki & Van Heuven, 2020 for details) as well as the suprasegmental (or prosodic) structure (differences in word and sentence stress, melody, and rhythm, see Yenkimaleki, 2017: 50-85 for a detailed description of the prosody modules). The positive effects of prosody-specific training were larger when the interpreting had to be done in the *recto* (Yenkimaleki & Van Heuven, 2018) than in the *verso* (Yenkimaleki, 2017) direction. We concluded that explicit knowledge and awareness of the prosody of the nonnative language are especially helpful for decoding the English input. In a follow-up study, we compared the contributions

of teaching segmentals versus prosody to the development of listening comprehension in English by our interpreter trainees, and concluded that exclusively teaching segmentals is more helpful than only teaching prosody (Yenkimaleki & Van Heuven, 2016).

Although listening comprehension is one of the important skills in second-language (L2) acquisition (Oxford, 1993; Yenkimaleki, 2017), the teaching and learning of this skill have been seriously understudied (McAndrews, 2020). McAndrews' literature review shows that little is known about the effects of targeted prosody instruction on global listening proficiency. The traditional view was that L2 listening comprehension naturally improves inductively, and develops automatically through exposure to L2 speech in the classroom (Clement, 2007). More recently, it has been argued that L2 listening comprehension skills demand awareness training (Oxford, 2002; Carrier, 2003; Chamot, 2004; Graham et al., 2011). Evidence has accumulated that correctly placed word stress is important for word recognition in English, for native and nonnative listeners alike (Buck, 2001; Field, 2005; Cutler, 2005, 2012). Also, Hahn (2004) has shown that incorrect sentence stress reduces the comprehensibility of nonnative English; conversely, we expect L2 listeners to benefit if they know how to use the communicative information provided by correct sentence stress in English. Van Wijngaarden (2001) showed that speech recognition in Dutch was negatively affected (a 3-dB raising of the speech reception threshold) for Dutch native listeners when the stimulus materials, whether spoken by native Dutch or nonnative English-accented speakers, were artificially monotonized. Recently, Keskin et al. (2019) reported that listening comprehension by Turkish primary schoolers suffered when all prosodic information was removed from a Turkish spoken text, at least when the questions required inferential listening (but not when literal content questions were asked). Luu et al. (2021) concluded that prioritizing prosody by using the techniques such as listening to low-pass filtered audio, repetition in synchrony with body movements, and shadowing, enhances listening comprehension skills. As can be expected from the above experimental results, explicit teaching of prosody and raising the learners' awareness of prosodic differences through formal teaching was found to have a positive effect on the understanding of English speech by nonnative listeners (Yenkimaleki, 2017).

McAndrews (2020) investigated the effects of prosody instruction on ESL listening comprehension skills. The effects of instruction were estimated by comparing the two groups on their comprehension of the target features, and their global listening proficiency, after instruction. Participants in the experimental group outperformed those in the comparison group on tests of global listening proficiency four and 11 weeks after instruction. Baştuğ and Keskin (2012: 243) found a modest but significant correlation between the correct use of prosody when reading aloud and listening comprehension skills (r = .55 for literal understanding and r = .67 for inferential comprehension) with Turkish primary-school children. Kato and Tanaka (2015: 195) reported much stronger correlations between listening comprehension ability and the quality of oral reading by adult Japanese students of ESL, with r = .88 for segmental quality, r = .89 for phrasing, and r = .92 for other suprasegmental features. This, to us, suggests that awareness of sentence prosody is crucial when reconstructing the speaker's communicative intentions during listening, and that prosody can only be correct in the read-aloud text if the reader has properly reconstructed the writer's intention. In general, these outcomes provide converging evidence supporting the inclusion of instruction on prosodic listening skills in ESL curricula.

Technology-assisted environments provide a productive working platform for interpreter training programs by combining multimedia elements with online resources to create a more authentic setting for interpreting practice (Lim, 2013). In the present study, the performance of interpreter trainees in two experimental groups (e.g., CAPT and BPI, see Section 1.2) was compared against the performance of students in a control group.

1.2 Computer-assisted pronunciation training

Computer-assisted pronunciation training (CAPT) has become a widely used tool in the foreign language teaching curriculum. CAPT, by offering a stress-free context, encourages learners to practice at their own pace, and access nearly unlimited input (Neri et al., 2002). Computer-assisted language teaching can improve the learner's

pronunciation through automated feedback (e.g., Thomson, 2011; Engwall, 2012). Luo (2014) investigated a CAPT technique to improve the pronunciation of Taiwanese English major students. Luo reported that the integration of CAPT technique, which combined oral reading with peer review, could improve students pronunciation compared to only in-class instruction. By incorporation of automatic speech recognition (ASR) learners can even interact with simulated native speakers. These types of conversations offer a dynamic range of interactions for foreign language learners (Bernstein et al., 1999). Moreover, by CAPT application tools, learners can receive instantaneous feedback (Pennington, 1999; Neri et al., 2002; Yenkimaleki & Van Heuven, 2019). By using different types of computer capabilities, CAPT offers special promise for pronunciation teaching (Pennington, 1996; Pennington & Esling, 1996). It can analyze the student's speech production in a repeatable, precise, and reliable manner (in the sense of being the same every time), and provide feedback on it, far faster than a human teacher can. CAPT could thus be superior to the human pronunciation teacher, even when s/he is a phonetician (e.g., Yenkimaleki & Van Heuven, 2019). Since CAPT does not suffer from limitations of hearing, judgment, or impatience, it is in many ways more authoritative, and therefore better trusted by students, than a human pronunciation teacher (Pennington, 1999), especially when the instructor is not a native speaker of the target language.

Through utilizing computer capabilities for presenting information in the visual and auditory modalities, the salience of instruction and feedback is enhanced. Pronunciation training can be individualized in ways the human teacher cannot provide, by algorithmic analysis of the individual student's problems (Pennington, 1999). Moreover, CAPT can provide a wider range of presentations, on-demand and on the spot, than a human teacher. To motivate students to work on their pronunciation, CAPT has the potential by offering a range of interesting tasks that students can practice in their free time. CAPT could increase students' metacognitive awareness and understanding of key features of the phonology of the target language, and of their own pronunciation as well.

Using CAPT, the learnability of phonology could be increased for adult students who passed the critical period (Pennington, 1999). Excluding the already established technologies, like the personal computer and internet access, in pronunciation teaching, new technologies like smartphones and other mobile internet-accessible devices, e.g., learning management system tools such as WhatsUp and Adobe Connect, have become widely available. Technological tools could increase learners' motivation, provide students with increased access to authentic target language input, interaction opportunities, and feedback, and offer teachers an efficient means for organizing course content and interacting with students (Golonka et al., 2014). In view of the advancement of technologies and the availability of these practical techniques in foreign language instruction in different countries, instructors may want to revise their methodologies and adjust them according to the different students' needs based on the available resources.

Prosody awareness training can partly be accomplished through recent technological advances in teaching prosody for English-as-foreign-language (EFL) learners (Yenkimaleki & Van Heuven, 2019). The rapid development of technology has changed the landscape of language education (Chang & Hsu, 2011). Amongst other changes, EFL learners can now easily access input reflecting authentic pronunciation by means of CAPT (Neri et al., 2001; Hsu, 2016). Computers and related technologies have come to be considered important media in learning and teaching (Adair-Hauck et al., 2000), also in the discipline of EFL. Tsai (2019) investigated how software users feel about the mediated assistance the system offers, their difficulty and attitudes toward using it, and, above all, how students could help each other, using MyET, a CAPT system designed in Taiwan.

The effectiveness of CAPT has been shown by several studies, e.g., Olson (2014) for the acquisition of Spanish intervocalic stop consonants by English learners, Liakin et al. (2014) for improving the pronunciation of French /y/ by English learners, Liakin et al. (2017) for learning to apply liaison in L2 French, and Liu and Hung (2016) for the general improvement of the pronunciation of English by adults with a Taiwanese Chinese background (in a quasi-experiment with no control group). Yenkimaleki and Van Heuven (2019) found that CAPT training was equally effective as (human) instructor-based pronunciation instruction (IBPT) to improve the prosody (word stress, sentence

stress), intelligibility, and comprehensibility of L2 English by Iranian student interpreters, where both experimental groups, CAPT and IBPT, outperformed a matched control group.

In spite of the positive effects attributed to CAPT, the evidence on technology use and its merits in foreign language teaching is limited (Felix, 2005), due to, e.g., lack of generalizable results, and scarcity of research (Golonka et al., 2014). Pennington (1999) sees the pedagogical aspect as the most important problem for CAPT. He argues that CAPT tools are often not grounded in a theoretical elaboration of pronunciation teaching, nor do they provide assessment tools to measure the user's improvement, even though researchers insist that pedagogy should be based on empirical findings (e.g., Derwing & Munro, 2005). According to Levis (2007), many CAPT applications are basically traditional, drill-oriented pedagogies in disguise. He maintains that a significant gap exists between CAPT application tools and aims suggested by current pronunciation theory and pedagogy. CAPT instruments often have technological difficulties in giving learners adequate and accurate feedback or providing an accurate and automatic diagnosis of pronunciation errors. Some instructors may even be not skilled enough to use CAPT tools efficiently (Levis, 2007). The use of technology in pronunciation teaching is far from settled. Golonka et al. (2014) claim that the application of new technologies can result in inappropriate input, shallow interaction, and inaccurate feedback, student frustration with software and hardware, a distraction from the learning task, and a general over-emphasis on delivery modality over learning objectives.

Tsai (2019) studied junior college students who practiced with a CAPT system for ten weeks, either with or without obtaining their peers' feedback. The mediation of technology and that of humans proved complementary. Each has functions that cannot be replaced by the other. This suggests that some mixture of CAPT and human feedback can be more effective than CAPT and human-human interaction by themselves. This brings us to the concept of blended learning.

1.3 Blended learning

To overcome the drawbacks associated with fully automated teaching, the blended learning concept has recently been advanced, a mechanism that combines the old and the new by impacting policy and strategic initiatives in higher education at different levels (Moskal et al., 2013). Blended learning is the deliberate blending of face-to-face and online instructional activities, with the purpose to stimulate and support learning activities (McDonald, 2014; Boelens et al., 2015). This recent development in higher education augments face-to-face classes with computer-assisted language learning modules (Trinder, 2009). A variation of blending could be employed, such as web-based activities for homework (e.g., Sagarra & Zapata, 2008) and courses which offer complete integration of CAPT with online activities (e.g., Ellis et al., 2006).

Blended learning is a modern teaching approach that integrates didactic teaching pedagogy with media-rich technology (e.g., CAPT). This approach is flexible in presenting content, where students can gain access to additional learning media supplementary to the formal classroom teaching, tutorials, or practicals. Blending CAPT with didactic lectures would meet some important criticisms which are leveled against CAPT. The blended learning approach is getting increasingly popular in university teaching practices, mainly because of the observed learning benefits through verbal, visual, and auditory stimulation. The most common advantages of blended learning include enhanced motivation in self-regulatory learning, increased level of engagement between students and instructors both inside and outside of the classroom, improved long-term retention of information for better cognitive learning (Barnard et al., 2009; Van Laer & Elen, 2017; Moradimokhles & Hwang, 2020). Additional advantages of blended learning over CAPT would be better catering to individual needs, a lower drop-out rate, and more clarification for the students (e.g., Lopez-Perez et al., 2011). The merits of blended learning over traditional face-to-face learning would be organizational benefits, flexibility (e.g., Macedo-Rouet et al., 2009), reduced costs (Sanders, 2005), unlimited time outside the classroom to complete online tasks (e.g., Murray, 1999), and the extension of materials and learning activities outside the university (e.g., Gimeno Sanz, 2009). Blended learning could positively impact on students'

performance in language skills (Scida & Saury, 2006), on the reinforcement of students' autonomy and reflection, the facilitation of the review and control of learning, more meaningful and individualized feedback (Gimeno Sanz, 2009), high ratings in enjoyment and usefulness (Peters et al., 2009), and more time-on-task (Stepp-Greany, 2002). Beauvois (1998) investigated the relative contribution of blended learning with purely computer-based training. Beauvois concluded that blended teaching has positive benefits over purely computer-based instruction in terms of the students' performance in language skills. She maintained that employing blended learning could be an ideal approach for the learners to follow the instructions in an anxiety-free environment. Moradimokhles and Hwang (2020) investigated the effect of online learning vs. blended learning in developing English language skills by nursing students. Their blended learning group outperformed the other groups in developing general English skills, with an overall score of 86 out of 100, a significant 5 points better than the pretest scores, while the progress made by the other groups was not statistically significant.

However, some scholars report drawbacks of blended learning, e.g., the lack of connection between CAPT tasks and face-to-face classroom activities (e.g., Carrio Pastor, 2009), which could result in students' failing the course (Stracke, 2007), or the decrease of guidance and monitoring of the students by the instructors. The students in these cases reported that the instructors abdicated their responsibility of monitoring the learners' activities and did not provide constructive feedback, and the students could not develop sufficient self-discipline (Conacher et al., 2004).

1.4 Accent Master courseware

There is no CAPT software for English that explicitly targets listening comprehension. However, there are several programs available which aim at increasing the student's general proficiency in spoken English. Most systems begin by having the user discriminate between contrastive sounds and melodies in English that do not occur in the majority of other languages. Also, many of these programs contain exercises of the listen-and-repeat type, which ask the student to listen to a model utterance produced by a native speaker, and then to mimic the model as accurately as possible (the better type of CAPT software then provides visual and/or numerical feedback on how closely the student's imitation approximated the model). We assume, therefore, that the use of general-purpose CAPT software will not only yield better speaking skills but will also strengthen the user's perceptual skills in the target language. Moreover, our teaching approach to English language skills is based on the principles of contrastive analysis (e.g., Lado, 1957; Odlin, 1989). We do not want to teach and rehearse sounds and sound contrasts in English already known to our students because they also occur in Persian. Rather, we concentrate on those properties of English that are different from, or unknown in, Persian. Only one CAPT system is available on the market that is adapted to the specific needs of Persian learners of English. We, therefore, use the Accent Master (AM) software, adapted for Persian learners by Bo and Bo (2005); for details on the contents of AM for Persian (see also Mehrpour et al., 2016). The AM courseware addresses both segmental and prosodic difficulties Persians may experience when learning to speak General American English. In the present study, we emphasized those modules in AM that pertain to prosodic matters.

AM has been used and tested before as a means of improving the pronunciation of English by Persian learners (Mehrpour et al., 2016). A pure CAPT group was compared with a control group that was taught by the traditional pronunciation program, with 10 hours of pronunciation training in a pretest-posttest design. Students were rated by four raters (including one L1 rater) on three tasks: (i) pronunciation of segments and stress in isolated read-aloud words, (ii) same in a read-aloud short text, and (iii) same in a retelling of a silently read text. The AM/CAPT-group gained 11 points (maximum score was 56 points) against a 1-point gain for the control group. The gain in the experimental group was significant for all eight rating scales (scores were not given separately per scale): vowels, diphthongs, consonants, end sounds, linking, word stress, sentence stress, intonation.

1.5 Purpose of the present study

As there are different unresolved perspectives on computer-assisted pronunciation teaching, Yenkimaleki & Van Heuven (2019) set up an experiment in Iran on the effect of computer-assisted prosody training vs. instructor-based

prosody teaching in developing speaking skills for interpreter students. The CAPT group showed a significant improvement of their speaking skills. Good nonnative speaking skills are indispensable for *verso* interpreting (i.e., from native Persian into foreign English); nonnative listening comprehension skills are especially important for *recto* interpreting (i.e., from a foreign language into the interpreter's native language, see Section 1.1). Furthermore, Yenkimaleki and Van Heuven (2016) studied the effect of teaching prosody on interpreter trainees' listening comprehension skills. They compared the performance of two groups of students, i.e., an experimental group which received prosody training by a human instructor (CAPT was not employed in the training program), and a control group which did not receive prosody training but instead received training in developing listening comprehension skills. The current study differs from our earlier studies in some respects. In the present study, three groups of interpreter trainees were formed, i.e., two experimental groups (CAPT and BPI), and one control group (CON). In the earlier study, CAPT and BPI were not included in the training program. In recent years, the integration of technology in education is undoubtedly increasing; interpreter training programs are also revisiting their methodologies while technological applications penetrate the training programs. Therefore, we now address specifically the relative contribution of CAPT and BPI in developing listening comprehension skills by interpreter trainees. Moreover, we also investigate the methodological perspectives for prosody instruction in developing listening comprehension skills by interpreter trainees. Given that interpreter training curricula should use the most effective methods of teaching prosody, as part of developing the students' listening comprehension skills, we do not compare CAPT with traditional full-time face-to-face teaching but with BPI, i.e., a mixture of CAPT and human instruction. The results of the present study may enhance the future curriculum of interpreter training programs. Concretely, we asked the following research question:

> *Which type of prosody training yields better listening comprehension skills for Farsi-English interpreter trainees given the same amount of training time: BPI or CAPT?*

Given that the human prosody instruction and feedback is given by an experienced and highly skilled university instructor, and that the essence of the CAPT contents covered by the AM courseware can be presented in a relatively short time frame, our hypothesis is that BPI will yield better listening comprehension skills than pure CAPT.

2. Method

2.1 Participants

The participants in this study were 51 Persian-speaking undergraduate students at the University of Applied Sciences in Tehran, Iran. None of them had studied or lived abroad. They had learned English in secondary school for four years, with two hours of lessons per week. In university, they had studied English language for three semesters before participating in the program at the University of Applied sciences. The age range of the students was between 21 and 24. They had passed the entrance exam for the translation and interpreting department, and met the requirement of a score of 8 or better on a 10-point scale for English language proficiency. The students were randomly grouped into three classes of 17 with an equal division between male and female students as much as possible, in the present case, 8 male and 9 female students per group. One class was assigned to CAPT instruction, a second group to BPI instruction, while the third served as a control group.

2.2 Ethics

Ethical approval to involve these participants in the experiments was obtained. All the participants agreed to take part in the research project by signing written informed consent.

2.3 Treatment

The participants took part in the program for 16 sessions (60 minutes per session) during four weeks, i.e., 16 hours in all. The general organization of the teaching program is shown in Table 1, separately for the control group and the two experimental groups.

Table 1. Summary of activities and time spent (minutes) by three groups of participants in the experiment.

Activity	Group		
	Control	BPI	CAPT
Listening to instructor explanations/guidance/comments	320	320	320
Prosodic theory and practice by the human instructor		160	
Prosodic theory, training, and practice by Accent Master		160	320
Audio tracks/ movies	640	320	320
Total time spent	960	960	960

Students in three groups listened to the instructor's explanations about the contents of the materials before listening to audio tracks and/or movies. This was the pre-listening stage, in which the instructor prepared the students to listen, e.g., talking about the topic of the materials in audio tracks/movies, creating motivation for the listening materials, elaborating on the specific critical vocabularies and the language structure of the materials. The students also received comments on their performance, and guidance in doing listening comprehension tasks/exercises. These activities took 20 minutes in each session, and altogether 320 minutes for the whole program. In all sessions, the instructor monitored and explained problematic issues raised during practicing and doing the exercises.

The control group (CON) received routine exercises, asking them to listen to authentic movies/audio tracks in American English and to discuss issues brought up in the movies/audio tracks for a total of 640 minutes. Students practiced intensive listening tasks, which were followed by detailed comprehension questions, e.g., inferring the meaning of unknown words. The movies, that the students watched, were not subtitled or captioned[1]. To help prepare students' expectations about what they are going to listen/watch and to aid in their comprehension, the instructor used warm-up questions, and brainstormed relevant vocabulary. The instructor introduced the topic, and got the students thinking about it. If felt necessary, the instructor presented a short list of keywords occurring in the movie/audio file that students might be unfamiliar with. The meaning of such keywords was illustrated by using them in disambiguating sentences before the audio file was started. The instructor played the movie clip/audio file first for general comprehension – to allow students to get the main idea. Then, he replayed it several times for the students to grasp more details. The pause button was used as needed to focus on sections students had difficulty in understanding. Next, students were asked to complete an exercise on the corresponding activity. Interesting, and in some cases, humoristic movies/audio files were chosen, covering a variety of topics such as politics, social issues, and scientific findings. Only good quality audio files with clear-voiced speakers were presented. The same procedure was followed in each of the 16 lessons.

The BPI group spent 320 minutes less time on these tasks; during the time freed-up this way, they received awareness training of English prosody in the form of theoretical explanation (see Appendix 1 for a lesson-by-lesson description

[1] Captioning refers to the process by which the audio content of a video, such as speech and other sounds, is converted into texts and are displayed on the screen (Hayati & Mohmedi, 2011).

of the training program) by the instructor, and practical exercises, e.g., listening to audio tracks which exemplified the role of word stress, rhythm, sentence stress and intonation in changing meaning in English for 10 minutes during each training session. Another 10 minutes per session were then spent on working with the AM Software with parts of modules selected such that these optimally fitted the phenomena that had been dealt with earlier by the human instructor.

The CAPT group received prosody training through the AM Software for 20 minutes during each training session. The students (both BPI and pure CAPT) watched video demonstrations in AM, which, as we have shown, help to improve the intelligibility of Iranian learners of English (see Appendix 2 for one example of the exercises students did when using the AM Software; the relevant video here highlights the difference that word stress can make in the meaning of Latinate noun-verb pairs such as *the ˈobject – to obˈject* (see below). Students watched videos and did the exercises, and listened for the shift in word stress (the vowel in the stressed syllable was longer, and the location of the pitch peak changed; the vowel in the unstressed syllable was reduced in quality and duration). In all lessons, using AM, students imitated spoken model words and sentences, and compared by ear and by eye the native model and their imitation in terms of temporal organization (e.g., comparing oscillograms) or speech melody (e.g., comparing pitch tracings). The exercises were chosen in such a way that the interpreter trainees would become aware of the importance of stress at the word and sentence level in the perception and production of messages, first noticing the differences and then practicing the English forms to make the production skill automatic.

2.4 Procedure

At the beginning of the program, all the participants took a pretest of English listening comprehension skills. Following the last training session, all interpreter trainees took the posttest. The time elapsed between the pretest and posttest was 16 weeks. Both pretest and posttest were versions of the listening comprehension skills test (both valid and reliable as it goes with the documentation of standard tests) taken from the standard Longman's TOEFL English proficiency test (paper-based version).[2] We chose the TOEFL listening comprehension test because it is easy to administer, is standardized, and has multiple equivalent versions. It comes in multiple-choice format (50 items with four alternatives each) for each equivalent version of the test. This reduces the influence of guessing to 25%. All versions of the test have been tuned to the same level of difficulty, as claimed by the documentation that goes with these tests.[3] This makes the test ideal for a pretest-posttest design. The pretest and posttest were different to rule out repetition effects.

Each test has 30 questions about short conversations, eight questions about longer conversations, each followed immediately by one question. At the end of the test, there are three lectures or talks, with four questions at the end of each talk, i.e., twelve questions in all. Interactants in the conversations are always one man and one woman, who ask and answer questions in alternating turns. The question that the student has to answer in multiple-choice format at the end of each item, is always asked by a male voice-over. The four alternatives to choose from are exclusively presented in print. The conversations and lectures are play-acted but embody realistic speech at a normal rate of delivery and contain many contractions of auxiliary verbs and reduced forms of function words. In the longer talks, repeated mention of the same referent is properly signaled by omitting the sentence stress on the repeated referent, and narrow focus is consistently signaled by sentence stresses on contrasted words, or between contrasted parts of words (as in ***DE****creasing rather than* ***IN****creasing*). In the longer talks and lectures the students will need optimal use of prosody to help them to keep complex information in memory, which is required to answer the series of questions at the end of

[2] https://www.pearson.ch/LanguageTeaching/Exams/TOEFL/EAN/9780131408838/Longman-Preparation-Course-for-the-TOEFL-Test-The-Paper-Test-Book-and-CD-ROM-with-Answer-Key

[3] http://pearson.es/espa%C3%B1a/TiendaOnline/longman-preparation-course-for-the-toefl-test-the-paper-test-with-an

the talk. Although the test does not explicitly or exclusively target prosodic phenomena, we consider the test an adequate means of measuring the student's receptive use of prosody in the comprehension of spoken English.

Students took the listening comprehension tests individually in a language laboratory. Audio files were played over headphones at a comfortable sound level that could be adjusted by the student. Once the audio started, the student could not pause or repeat items. In compliance with the TOEFL-test instructions, students were not allowed to take notes while listening. Participants were issued a 50-page booklet with one page per test item (one-sided), listing the four alternatives in standard American English orthography. Students indicated their response by encircling the letter (A, B, C, D) corresponding to the alternative of their choice. They were instructed to turn the page immediately after each response, and were explicitly warned not to skip back or forward to other pages in the answer booklet.

3. Results

In this study, we compare the results obtained for three groups of participants in a pretest-posttest design. Our first concern is to establish that the three groups were equal in terms of their listening comprehension skills at the beginning of the treatment. Even if the three groups do not differ in their distributional properties, there will be large differences between the individual participants within each group. Generally, students who have a high listening comprehension score before the treatment will have at least the same score after the treatment. To reduce the individual pretest score as a source of variability when testing the effect of the treatment, we analyze the gain, i.e., the improvement made by the individual participant, obtained between pretest and posttest.

3.1 General

Table 2 presents descriptive and inferential statistics for the pretest scores, posttest scores and gain, i.e., the difference between the pretest and posttest scores, obtained for each of the three groups of participants. Our basic assumption was that the three groups would be equally distributed in terms of English listening comprehension skills at the start of the treatment. This assumption proved warranted: the means and standard deviations of the pretest scores were essentially the same across the three samples of interpreter trainees. The pretest scores ranged between 30 and 42 items correct (or between 60% and 84% correct, with a chance level of 25% correct; see Appendix 3 for the raw data). The pretest scores were bimodally distributed, for each group of participants separately as well as for the three groups combined, so that the requirements for parametric testing are not met. Consequently, we used non-parametric alternatives (Siegel, 1956) whenever possible. The Kruskal-Wallis test confirmed that the minute differences between the three means are nowhere near significance (Table 2, pretest score). Therefore, we may conclude that there were no differences in English listening comprehension skill among the three groups of participants before the treatment.

Table 2. Pretest scores, posttest scores, and gain (Δ posttest − pretest) broken down by the three participant groups. Mean and median are listed as measures of central tendency. Dispersion measures are the standard deviation (SD), and the lowest and highest score found. N = 17 for each participant group. Raw data can be found in Appendix 3. One-tailed testing was applied in all comparisons except for the pretest scores. Significant effects are bolded.

Dependent		Participant group			K-W test		Posthoc U-tests (Bonferroni α = .017)			
		CON	CAPT	BPI	$\chi^2(2)$	p		CON-CAPT	CON-BPI	CAPT-BPI
Pretest score	Mean	35.1	34.8	34.9	0.1	.953	z	0.2	0.3	0.0
	Median	34.0	34.0	34.0			p	.808	.768	.972
	SD	3.76	3.83	3.66						
	Lowest	31.0	30.0	30.0						
	Highest	41.0	42.0	40.0						
Posttest score	Mean	36.1	37.1	38.4	3.1	.212	z	1.8	0.7	1.0
	Median	36.0	36.0	38.0			p	.038	.256	.185
	SD	3.77	3.63	3.60						
	Lowest	30.0	32.0	33.0						
	Highest	41.0	42.0	42.0						
Gain	Mean	1.1	2.4	3.5	23.1	**< .001**	z	3.76	3.96	2.86
	Median	1.0	2.0	4.0			p	**< .001**	**< .001**	**.002**
	SD	0.60	0.99	1.73						
	Lowest	–1.0	1.0	0.0						
	Highest	2.0	4.0	6.0						
Wilcoxon test	z	3.1	3.4	3.6						
	p (one-tail)	**.001**	**< .001**	**< .001**						

The effect of the treatment is seen in the posttest scores, and more clearly in the gain. Across all individual participants, the gain ranged between −1 and +6 items correct. A negative gain means that the individual student made more errors in the posttest than in the pretest, even though the pretest and posttest are claimed to be equally difficult. Negative gain was found twice for CON, once for CAPT and never for BPI. For the large majority of the students, however, the scores were better in the posttest than in the pretest, which we would attribute to the treatment (although we cannot exclude the possibility that part of the gain might be due to the students' getting used to the test format). The gain obtained by the control group is 1.1 item (or 2 points on a percentage scale). As shown in Table 2, the gain for this group is significant by a Wilcoxon signed rank test. The gain is larger for the CAPT group: 2.4 items better or 5 points, and largest for the BPI group: 3.5 items better or 7 points. The overall effect of the instruction type on the gain is significant by the Kruskal Wallis test. Post-hoc testing was done by repeated Mann-Whitney U-tests (one-tailed). Bonferroni correction for multiple comparisons was applied here so that alpha is lowered from .05 to .017. Both CAPT and BPI have significantly higher gain than CON. Importantly, the gain by the BPI group is significantly larger than by the CAPT group.

Figure 1A plots the posttest scores of the 17 individuals in each of the three instruction groups against their pretest scores. Linear regression lines have been drawn through the three scatter clouds. The three lines are ordered from top to bottom in accordance with the results shown in Table 1: BPI at the top, and CON at the bottom, with CAPT in between. It can be seen that the pretest and posttest scores are strongly correlated, in all conditions (for details see Table 3). A Cocor analysis (Diedenhofen & Musch, 2015) shows that the *r* obtained for the BPI group is significantly poorer than the *r*-value found for the CON group but does not differ from the *r* in the CAPT group, while the *r*-values for CAPT and CON are not significantly different either. The reason why we find these differences in the correlation becomes more apparent when we consider Figure 1B, where we plotted the gain as a function of the individual pretest scores.

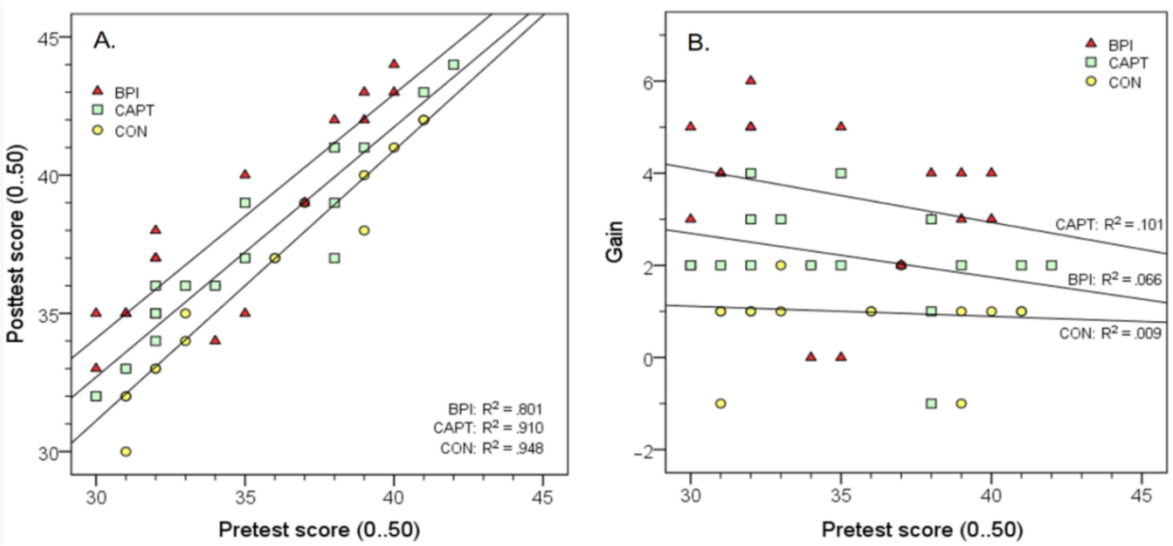

Figure 1. Panel A: Posttest score (maximum score = 50) as a function of pretest score plotted separately for three groups of 17 participants, i.e., control group (CON), blended prosody instruction group (BPI) and computer assisted pronunciation training group (CAPT). Regression lines were drawn for each group: BPI top, CAPT middle and CON bottom. Note that multiple occurrences of combinations of pretest-posttest scores are not visible in the plot. Panel B: Gain (posttest score minus pretest score) plotted as a function of the pretest score.

Figure 1B shows that the gain in the BPI group is greater (top regression line) than for the CAPT group (middle regression line), which in turn is higher than the line for the CON group. This, of course, reiterates the information seen in Table 1. What is new is that the very small gain obtained by the CON group is not correlated with the level of sophistication of the students: both students with relatively poor and with higher pretest scores gain the same small amount, so that the correlation between gain and pretest score is (almost) zero (for details see Table 3). For the CAPT group, there is a very weak correlation between gain and pretest score. For the BPI group the correlation is stronger, but still insignificant. Although the correlation coefficients are too low to reach significance with $N = 17$, they suggest that the poorer students benefit more by the treatment than the better students. This would be what one would expect: poorer students have more room for improvement, while good students, i.e., sophisticated users of English as a foreign language, already have implicit knowledge of the materials covered in the training so that they do not learn anything new.

Table 3. Correlation coefficients (Pearson's r and Spearman's rho) between pretest and posttest scores, and between pretest scores and gain. N = 17 for all comparisons. All correlations are tested for significance (α = .05 one-tailed). The significance of differences between r-values is tested for significant correlations only. Significant (differences between) correlation coefficients are bolded.

Correlation between		Condition				Cocor comparisons (one-tailed)		
		CON	CAPT	BPI		CON-CAPT	CON-BPI	CAPT-BPI
Pretest-posttest	r	.974	.954	.895	z	0.770	1.900	1.130
	p	**< .001**	**< .001**	**< .001**	p	.221	**.029**	.129
	rho	.984	.972	.884				
	p	**< .001**	**< .001**	**< .001**				
Pretest-gain	r	–.096	–.317	–.256				
	p	.357	.107	.160				
	rho	–.072	–.240	–.328				
	p	.392	.276	.099				

3.2 Closer examination of the posttest results

Figure 2 shows the percentage of correct answers given by BPI and CON participants to the 50 test items, separately for the short and long items, which are arranged in ascending order of the time elapsed between the onset of the audio passage and the end of the spoken question pertaining to it – as an indication of memory load caused by the item.

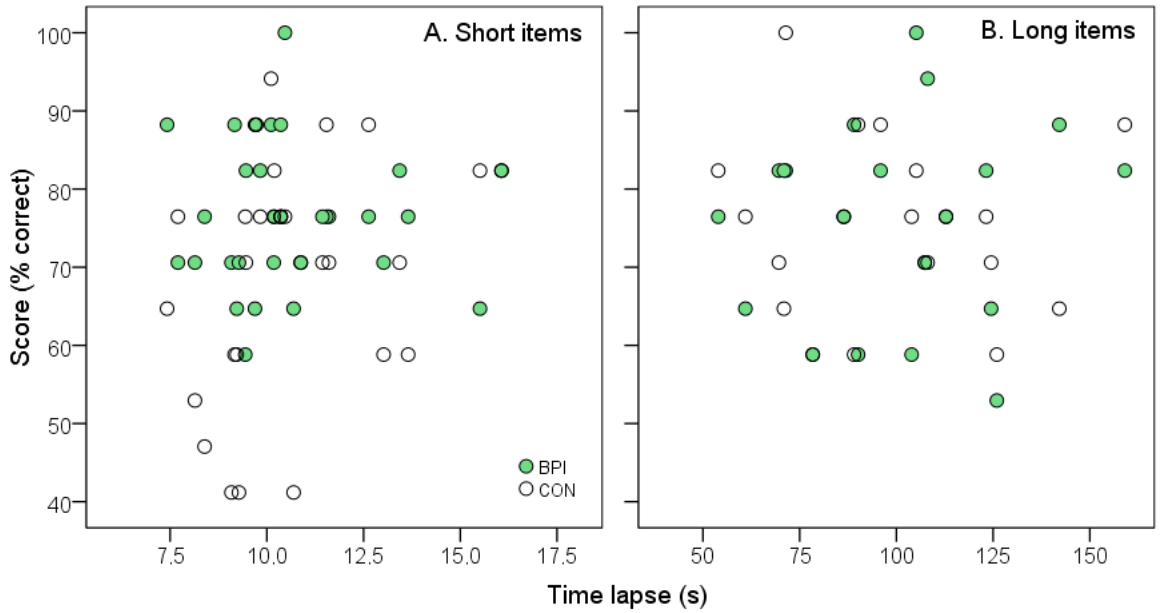

Figure 2. Percentage of correctly answered comprehension test items by listeners in BPI and CON groups, as a function of time elapsed between onset of item and end of question (seconds) separately for 30 short items (panel A) and 20 long items (panel B).

The difference between the two groups (75.6 vs. 76.2% in favor of BPI) is insignificant for the 20 long items in panel B by a Wilcoxon test, z = .34 (p = .735). However, the difference between the CON group (70.2%) and the BPI participants (76.5%) is significant for the 30 short items in panel A, z = 2.07 (p = .038, two-tailed). There is no correlation between the time lapse and the percentage of correct responses. It would seem, therefore, that the only difference between the BPI and CON groups resides in a small number of items with scores below 55% correct for the CON group that happen to be characterized by short time lapses (between 7.5 and 11 seconds). We inspected these five items but could find no properties that would be susceptible to the BPI training in prosody. The items concerned (nrs. 5, 7, 11, 14 and 25) depend primarily on knowledge of the meaning of specific words or expressions rather than on something prosodic.

4. Discussion

Prior studies have found that pronunciation instruction can improve L2 learners' global listening comprehension skills as long as enough time is allotted for prosody instruction (e.g., McAndrews, 2020; Kato & Tanaka, 2015; Yenkimaleki & Van Heuven, 2016). Prior studies also have found that the application of CAPT (e.g., Adair-Hauck et al., 2000; Neri et al., 2001; Chang & Hsu, 2016; Tsai, 2019; Yenkimaleki & Van Heuven, 2019) in language education would benefit EFL learners. The present study sought to determine the choice of appropriate methodology (CAPT or BPI) in teaching prosody to interpreter trainees when developing listening comprehension skills. Our results revealed that both BPI and CAPT significantly improved the students' listening comprehension skills. Moreover, BPI yielded significantly better listening comprehension skills than devoting the same amount of time to the teaching of prosodic

characteristics of English through pure CAPT. The results of this study converge with Beauvois (1998), Seida and Saury (2006), Barnard et al., (2009), Van Laer and Elen, (2017), and Moradimokhles and Hwang (2020), who showed that blended teaching has benefits over purely computer-based instruction in terms of the students' performance in language skills. More specifically, Moradimokhles and Hwang (2020) found that blended instruction yields better English language skills than either traditional methods of face-to-face teaching or employing pure online learning strategies.

Prosody training makes the learner aware, first of all, of the differences between the L1 and the L2 in regularities that determine which syllable is stressed at the word level and which words are made prominent at the sentence level. For instance, the L1 of the participants in the present study, Farsi, is a language that typically stresses the stem-final syllable in the content word (e.g., Ferguson, 1957; Hosseini, 2014; Sadeghi, 2017). The stress system of English is much more complex, with rules that take the weight of syllables (as determined by the presence of long vowels, diphthongs and coda consonants) into account (e.g., Author 1 & Van Heuven, 2018). In practice this means that Farsi learners of English cannot routinely stress the final syllable in English but must learn the stress pattern for each English word separately and store it in their bilingual mental lexicon. Prosody training through BPI made students segment the speech stream and identify the words and sentences in the message better than by the CAPT application. This could be because of the anxiety-free environment which the BPI method provided to the interpreter trainees when learning prosodic features of English, in so far as they felt that the instructor was there to assist them whenever needed (e.g., Beauvois, 1998; Gimeno Sanz, 2009).

The results of the study indicate that methodological issues in teaching prosody matter. The findings suggest that the BPI methodology be employed for developing listening comprehension skills by interpreter trainees. Earlier studies emphasized the inclusion of prosody training in EFL curricula (e.g., Oxford, 2002; Carrier, 2003; Chamot, 2004; Graham et al., 2011, Yenkimaleki & Van Heuven, 2020) for developing listening comprehension skills (e.g., McAndrews, 2020; Baştuğ & Keskin, 2012; Kato & Tanaka, 2015; Yenkimaleki & Van Heuven, 2016). Prosody awareness training plays an instrumental role in the encoding and decoding of meaning (e.g., Oxford, 2002; Carrier, 2003). Segmentation of continuous speech into syllables, words and phrases, informing syntactic structure, and emphasizing content words and other salient information are prosodic functions that facilitate the processing of speech (e.g., Chamot, 2004; Graham et al., 2011). Successful decoding input speech in the non-native language may benefit from an explicit comparison of the prosodic properties of his native language and those of the L2 (e.g., McAndrews, 2020; Baştuğ & Keskin, 2012).

Our findings suggest that combining CAPT with instructor-based prosody teaching enhances interpreter trainees' listening comprehension skills more than using pure CAPT. In our study, the poorer students benefited more by the blended prosody training than the better students. This would be what one would expect: poorer students have more room for improvement, while good students, i.e., sophisticated users of English as a foreign language, already have implicit knowledge of the materials covered in the training so that they do not learn anything new. The study by Luo (2014) revealed that the integration of a CAPT technique that combines oral reading with peer review would be effective in increasing students' learning gains on pronunciation compared to only in-class instruction and in-class feedback from the instructor. Luo's results are especially relevant for large EFL classes, where the teacher is not able to give enough feedback to every student in class.

The question remains to be answered why blended learning should be more beneficial than pure CAPT, specifically when applied to the effect of teaching prosodic differences between L1 and L2 on the development of listening comprehension skills. We believe that the Accent Master course that was used on the CAPT condition, and which also constituted an important part of the BPI treatment, even though adapted for use with Persian learners of English, offers only limited exposure to and explanation of the prosodic differences between L1 and L2. The availability of an expert human instructor in the BPI treatment must have made an important difference. The human instructor could paraphrase explanations, provide more background information, monitor students' responses and provide them feedback tailored to the individual needs, thereby motivating students to improve their task performance. More generally, BPI gives the

students the best of both worlds, as was argued by pedagogists (see section 1.3): it combines the benefits of the patient and anxiety free environment of computer-assisted instruction with the personal attention afforded by human expert instruction.

Based on the findings of the present study, we reiterate that the effect of our prosody training is small, and seems to be restricted to tasks that do not require the EFL listener to keep a long stretch of speech with complex information in memory for more than 11 seconds.[4] We found a significant difference between the BPI and the CON listeners only for listening comprehension items in which the time elapsed between the start of the speaker and the end of the content question asked about the passage did not exceed 11 seconds. For longer time spans, no effect of BPI training could be established. It remains difficult to understand why the BPI group, which received special dedicated training in, and explanation of, prosodic features, by machine and by a human instructor, should benefit more for short dialogues than for longer dialogues and lecture-style monologues. Correct responses to these longer items rely strongly on memory: the student has to keep a multi-sentence conversation or lecture in memory before answering a series of questions. The high memory load would then seem to obliterate any advantage the BPI listeners may have experienced from their better prosodic understanding. Prosodic understanding would seem to do its job better when there is only a short time lapse between hearing the information and the associated question about it. The correct response to the short test items depends largely on the student's recognition and knowing the meaning of a specific word or expression. It would seem to be the case, then, that the benefit of our prosodic training lies mainly in its contribution to word recognition, most likely to the better use of stress patterns to activate particular words in the bilingual lexicon and rule out competitors. Possibly, the increased memory load of longer stretches of speech forces the Persian listeners to abandon the non-automatized use of English word prosody, and fall back on their native habit of disregarding lexical word stress information, a listening strategy that is typical of listeners whose native language has fixed (or nearly fixed) word stress. The functional non-use of word stress by such listeners is known as "stress deafness" (e.g., Dupoux et al., 2008; Rahmani et al., 2015), which would also apply to Persian listeners, since Persian word stress is fixed on the final syllable (Ferguson, 1957; Hosseini, 2014; Sadeghi, 2017). This will also cause Persian listeners to assume that the syllable following a perceived word stress will be the beginning of a new word. This native stress-based word segmentation strategy, which will be counterproductive in English, cannot easily be suppressed when processing a different language (Cutler, 2012).

Some researchers investigated the attributes that support self-regulation (Barnard et al., 2009;Van Laer & Elen, 2017), and variation in adult learners' experience (McDonald, 2014) in blended learning programs. They reported that the organization, discipline, time management, and self-regulations of students are the important variables in blended learning environments. Crucial problems have been reported in the mere application of CAPT, e.g., inappropriate input, shallow interaction, and inaccurate feedback (Levis, 2007; Golonka et al., 2014; Tsai, 2019; Yenkimaleki & Van Heuven, 2019). Therefore, blended learning could help out here: some of the issues can be given to the student as practical tasks interpreters to work on online at home. BPI can also provide learners with opportunities to receive comprehensible input and feedback when doing the tasks/exercises from the instructor. By a prudent blending of computer-assisted tools and interpreting tasks, students could work on the issues properly in a meaningful context, which could raise students' awareness of the prosodic features of the target language in message perception and production.

[4] Similarly small (but significant) effects of prosodic training on the development of listening comprehension in EFL was reported recently by Luu et al. (2021). A control group of 30 Thai students took a 10-hour listening comprehension training using traditional methods with no special emphasis on prosody. The experimental group (N = 35) received computer-aided prosody training instead. The groups were roughly equal on the pretest (7.9 vs 8.4 points, on a scale from 0 to 30) but differed significantly on the posttest (9.3 vs 11.3). The experimental design, however, precludes assessing the separate contributions of emphasis on prosody and of using CALL.

5. Conclusion

The results show, first of all, that both BPI and CAPT significantly improved the students' listening comprehension skills, relative to the control condition in which no special and explicit attention was given to word and sentence prosody. This answers our first research question: explicit prosody instruction helps Persian student interpreters improve their English listening comprehension skills. Secondly, BPI, the hybrid instruction method that combines CAPT with explanation and feedback by a human expert, yields significantly better listening comprehension skills than devoting the same amount of time to the teaching of prosodic characteristics of English through pure CAPT.

We have shown that knowledge or awareness of the prosodic features of a non-native language helps developing listening comprehension skills. We suggest, accordingly, that in the given circumstances, where only limited curricular time is available for instruction and practice, a wise educational choice would be to lend priority to BPI and practice of prosodic features of the non-native language in developing listening comprehension skills. This does not mean, however, that computer assisted prosody teaching should be abandoned in developing listening comprehension skills. Our results do show a significant contribution of CAPT to the development of listening comprehension skills. However, BPI, being an optimal mixture of CAPT and human instruction, would be the preferred alternative approach to traditional interpreter training. This approach assists interpreter students in developing listening comprehension skills, and also makes them aware of the potential useful advantages of computer technologies in interpreter training. The application of this approach, however, requires an investment in hardware and software, and the in-service updating of the current practitioners in interpreter training programs.

A limitation of this study is that only 51 interpreter trainees participated in this study, i.e., 17 participants per condition. We did not have access to larger numbers of participants. Future studies could be set up with larger numbers of participants and also with different first language backgrounds to confirm the results of this study and test its generalizability. We may, in fact, foresee a research agenda in which a range of combinations of typologically different native and foreign languages (the latter not only English) are studied with respect to the differential benefits of pure CAPT, purely human instruction and blended learning. Ideally, the results of such a research program would inform the field which pedagogy would be optimally effective given specific similarities and differences between L1 and L2.

The pedagogical implications of the present study could be applied to interpreter training programs at least in Iran. Practitioners in different academic settings should be aware of the importance of CAPT learning accompanied by human explanation of the issues to the students, i.e., blended learning. This demands that instructors should be updated on the application of different software tools for CAPT learning, and universities should be equipped with the technological tools required for their teaching programs.

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Appendix 1: Prosody training program for BPI group (I. stands for Instructor; 10 minutes per week)

Lesson	Instructor prosody training (10 minutes)	Practice	CAPT (10 minutes for BPI, 20 for CAPT)	Practice
1.	a. Marking syllables: I. played a list of words/ sentences and had students count syllables and mark which syllables were stressed. b. To improve students' intonation, I. provided model sentences with exaggerated intonation contours so that students notice the peculiarities. **Examples:** **Words**: *deport, demarcation, campsite, cardiologist, carnival, catastrophe, cavalry, champion, charger, cheery, chowder.* **Sentences**: *The increased pressure within the muscle compresses nerves and blood vessels. The players had swelling in their triceps. I was just kind of shocked this was happening to us. The students said they did not take any body building supplements. We believe it was a strenuous workout, but we don't believe it was excessive. That's used so commonly by athletes of all ages.*	I. asked students to draw syllable boundaries and mark stresses in printed words and sentences on a work sheet and hand this in for assessment. I. asked some students to come in front of class to read the words/ sentences aloud again to see how much they were able in practice to produce the correct stress patterns of words and sentences.	Students were asked by using Accent Master software to: a. view the waveform of each sound pronounced by the native speakers in the spectrogram; b. record their own pronunciation of each sound; c. compare the sound and waveform of their own voice and the native speaker; d. see how each sound is made through detailed front and side views of the human mouth; e. practice some selected words monitoring the stress patterns of words.	I. moved around the class and helped students when needed.
2.	a. As 1a but different examples. b. As 1b but different examples. **Examples:** **Words:** *commands, concern, compassion, hidden agenda, diplomatic, persuasive, manipulative, commander, military aid recipient, civilian.* **Sentences:** *This year we have been seeing a slow-growth economy. Investors shy away from an oscillating market. I am confident this is a secular bull market. It's a case of dollars chasing stocks. Retailers are euphoric about general-merchandise sales. There's been some pick-up in the wholesale sector. The cautious will stand by during the market catch-up. This stock is an attractive turnaround situation. The overall economy shows strong secular growth prospects.*	As week 1.	Students were asked by using Accent Master software to: a. practice some selected words monitoring the stress patterns of words; b. compare the sound and waveform of their own voice and the native speaker; c. record their own voice whilst pronouncing some words and compare them with the voice of the native speaker.	As week 1.

Lesson	Instructor prosody training (10 minutes)	Practice	CAPT (10 minutes for BPI, 20 for CAPT)	Practice
3.	a. As 1a but different examples. b. I. had students imitate intonation patterns of sentences. **Examples:** **Words**: *cautious, market catch-up, attractive turnaround situation, overall economy, secular growth prospects, internal growth characteristics, interactive software, durable goods, hiring top-performing mutual fund managers.* **Sentences:** *Hardware stores are losing their market niche to superstores. Financial markets are only just recovering from the tequila effect. This month we've had a stealth bull market. Every now and then we get a horrendous correction. Innovations have thinned the ranks of the competition. There is overcrowding of supply in this sector, producing some margin pressures. Retail is having soft sales.*	As week 1.	Students were asked by using Accent Master software to: a. see how each sound is made through detailed front and side views of the human mouth; b. practice some selected words monitoring the stress patterns of words; c. record their own voice whilst pronouncing some words and compare them with the voice of the native speaker; d. practice sentences for stress, timing, articulation, intonation and rhythm.	As week 1.
4.	a. As 1a but different examples. b. I. asked students to compare two tokens of the same phrase, e.g., lively vs. flat intonation, to raise their awareness of the intonation patterns. **Examples:** **Words:** *A milquetoast bear, stupendous margin, call propelling, unwinding of a lot of leverage, stock market cycle, redundant, unnecessary, parasitic, incomprehensible.* **Sentences:** *Supply is expanding to meet demand and then some. These stocks have solid, tappable earnings. If the fundamentals deteriorate, we'll get out. This is an interest-sensitive sector. It's been a sterling performance for technology stocks. He is one of the year's standout stock pickers. The holiday season was less than a sales bonanza.*	As week 1.	Students were asked by using Accent Master software to: a. record their own voice whilst pronouncing some words and compare them with the voice of the native speaker; b. practice sentences for stress, timing, articulation, intonation and rhythm; c. listen to two short audio scripts and repeat them. Students recorded their speech to compare it with the original version.	As week 1.

Lesson	Instructor prosody training (10 minutes)	Practice	CAPT (10 minutes for BPI, 20 for CAPT)	Practice
5.	a. As 1a but different examples. b. As 4b but different examples. **Examples:** **Words:** *unbridgeable difference, contention, sophisticated rendition, metaphor, proverb, political development, incapable of proper control, contrivance.* **Sentences:** *There's been some liquidation in industrial commodities. In some sectors, there is chronic overcapacity. Some stock areas are oversold. Inflation would be a problem if we saw some broad-based signs of inflation, not just a commodity blip in selected markets. People are taking giant bets on hedge funds. Existing bond earnings might be grandfathered if a flat tax law is passed. Nobody bets 1000 in financial predictions.*	As week 1.	Students were asked by using Accent Master software to: a. record their own voice whilst pronouncing some words and compare them with the voice of the native speaker; b. practice sentences for stress, timing, articulation, intonation and rhythm; c. listen to two short audio script and repeat it. Students recorded their speech to compare it with the original version.	As week 1.
6.	a. Identification of content and function words: I. asked students to underline content words in sentences in audio samples**.** b. I. explained and demonstrated the relationship between grammatical patterns and intonation (falling and rising) **Example:** *Snow and ice dominated the headlines for more than a week at the start of the year, as Britain shivered in the longest cold spell for almost 30 years. Thousands of schools closed, buses, trains and planes were delayed, and power supplies failed as winter chaos reigned. On 12 January, a devastating earthquake struck Haiti, claiming 230,000 lives and leaving more than one million people homeless. In the UK, Jonathan Ross announced he was leaving the BBC after 13 years. The corporation's highest paid star insisted his decision was not financially motivated.*	I. asked students to mark the content words in a printed version of the audio materials, and hand in their work for feedback.	Students were asked by using Accent Master software to: a. listen to two short audio scripts and repeat them. Students recorded their speech to compare it with the original version; b. listen to some phrases, repeat and compare with original version.	As week 1.

Lesson	Instructor prosody training (10 minutes)	Practice	CAPT (10 minutes for BPI, 20 for CAPT)	Practice
7.	a. As 6a but different examples. b. Gestures were introduced to clarify pitch changes, e.g., sweep of the hand either up or down. **Example:** *BBC news journalists have been told to use social media as a primary source of information by Peter Horrocks, the new director of BBC Global News who took over last week. He said it was important for editorial staff to make better use of social media and become more collaborative in producing stories. "This isn't just a kind of fad from someone who's an enthusiast of technology. I'm afraid you're not doing your job if you can't do those things. It's not discretionary", he is quoted as saying in the BBC in-house weekly Ariel. Horrocks said that technology was changing journalism, adding that it was important for the BBC to leave a programme-based mindset behind and adapt to new technologies.*	As week 6.	Students were asked by using Accent Master software to: a. record their own voice reading the sentences and compare them with the voice of the native speaker; b. listen to one short audio script and repeat it. Students recorded their speech to compare it with the original version.	As week 1.
8.	a. As 6a but different examples b. I. drew arrows on the blackboard to make students aware of the intonation patterns. **Example:** *The species list was put together by scientists at the BBC and Conservation International and they feature in the BBC TV program Decade of Discovery, shown tonight. The stick-insect's common name is Chan's megastick and, at about the length of your arm, it is the longest insect in the world. Chan's megastick is found in Borneo and was only given its scientific name, Phobaeticus chani, in 2008. Scientists think it probably lives high up in the rainforest canopy, something that would have helped it stay hidden from view for so long.*	As week 6.	Students were asked by using Accent Master software to: a. record their own voice reading the sentences and compare them with the voice of the native speaker; b. listen to one short audio script and repeat it. Students recorded their speech to compare it with the native speaker's version.	As week 1.

Lesson	Instructor prosody training (10 minutes)	Practice	CAPT (10 minutes for BPI, 20 for CAPT)	Practice
9.	a. As 6a but different examples. b. I. asked students to repeat selected sentences after him. (Repetition is the easiest way of practicing intonation.) **Example:** *Most read this month was the shooting rampage by taxi driver Derrick Bird which left a dozen people dead and 25 injured in Cumbria. The first fatality was his twin brother, David, in Lamplugh. He then shot two others he knew before driving south, apparently shooting people at random. His body was found in the Boot area. Chancellor George Osborne's Budget came next as he increased VAT and cut welfare spending to tackle Britain's record debts***.**	As week 6.	Students were asked by using Accent Master software to: a. record their own voice reading the sentences and compare them with the voice of the native speaker; b. practice some phrases and compare them with native speaker's version.	As week 1.
10.	a. As 6a but different examples. b. I. exaggerated the main features (e.g., a falling tone in some questions) to make students aware of the intonation patterns. **Example**: *August threw up a mixed bag of news in keeping with its traditional "silly season" tag. Sky watchers enjoyed "fantastic views" of the annual Perseid meteor shower and a US man taken to hospital for a collapsed lung was told he had a pea plant growing in his lung. Comedian Tim Vine won a prize for the funniest joke of the Edinburgh Fringe. His gag: "I've just been on a once-in-a-lifetime holiday. I'll tell you what, never again."*	As week 6.	Students were asked by using Accent Master software to: a. record their own voice whilst pronouncing some phrases and compare them with the voice of the native speaker; b. listen to one short audio script and repeat it. Students recorded their speech to compare it with the native speaker's version.	As week 1.

Lesson	Instructor prosody training (10 minutes)	Practice	CAPT (10 minutes for BPI, 20 for CAPT)	Practice
11.	I. asked students exaggerate stress production: I. encouraged students to exaggerate their production of stress and rhythm of words to identify the meaning. **Examples:** *inter~enter, live~leave, bear~beer, hair~here, blue~blew, fair~fare, loud~load, blouse~blows, full~fool, would~wound, pull~pool, carve~curve, card~curd, fair~fear, stir~steer, bird~beard, sit~seat, slip~sleep, fit~feet, hit~heat, rid~read, ship~sheep.*	I. asked students to pronounce words in an exaggerated manner to identify their meaning.	Students were asked by using Accent Master software to: a. watch a short movie (e.g., two minutes) and retell the sentences of the characters in the movie; b. record their speech and compare it with native speaker's version. They could stop on some words and watch the wave graph of it and compare it with the native speaker's version.	As week 1.
12.	As 11 but different examples. **Examples:** *abate~abbot, abort~about, absolve~absorb, admiral~admire, adapt~adopt, affect~effect, billow~bellow, heed~hide, come~calm, come~comb, deer~dear, reed~read, scene~sin, feel~fill, curious~curiosity, hit~heat, bit~beat, cat~cut, heard~hurt, code~coat, mate~made, lope~lobe, cart~card, broke~brogue, back~bag, laid~led, paste~pest, fade~fed, barn~burn, lark~lurk, life~laugh, tight~tart, spike~spark, fear~fee, steered~steed, beard~bead, moor~more, dour~door, tour~tore, sure~shore, air~ear, steel~still, been~bin, half~huff, mast~must, heart~hat, part~pat, wooed~wood, balm~bomb, dark~dock, bead~bid, fill~fell, built~belt, lift~left, tin~ten.*	As week 11.	Students were asked by using Accent Master software to: a. watch a short movie (e.g., two minutes) and retell the sentences of the characters in the movie; b. record their speech and compare it with native speaker's version. They could stop on some words and watch the wave graph of it and compare it with the native speaker's version; c. compare the stress patterns and intonation of their speech with the native speaker's version. They could stop and repeat it many times.	As week 1.

Lesson	Instructor prosody training (10 minutes)	Practice	CAPT (10 minutes for BPI, 20 for CAPT)	Practice
13.	a. Changing the meaning: I. played words and phrases to the students with contrastive stress and then discussed the meanings. b. I. exaggerated the main features (e.g., a falling tone in some questions) to make students aware of the intonation patterns. **Example:** *ˈgreen house~green ˈhouse, ˈblackbird (a special bird)~black ˈbird (any bird with black feathers), ˈwhite house~ white ˈhouse, absent* (ˈæbsənt~əbˈsɛnt), *accent* (ˈæksənt~ əkˈsɛnt), *addict* (ˈædɪkt~əˈdɪkt), *address* (ˈædrɛs~əˈdrɛs), *attribute* (ˈætrɪbjuːt ~əˈtrɪbjuːt), *compact* (ˈkɒmpækt~kəmˈpækt), *console* (ˈkɒnsəʊl~kənˈsəʊl), *construct* (ˈkɒnstrʌkt~kənˈstrʌkt), *impact* (ˈɪmpækt~ ɪmˈpækt), *object* (ˈɒbdʒɪkt~əbˈdʒɛkt), *record* (ˈrɛkɔːd~rɪˈkɔːd), *present* (ˈprɛzənt~prɪˈzɛnt).	I. asked students to put the stress on different syllables and then discussed the meaning differences with them.	Students were asked by using Accent Master software to: a. watch a short movie (e.g., two minutes) and retell the sentences of the characters in the movie; b. record their speech and compare it with native speaker's version. They could stop on some words and watch the wave graph of it and compare it with the native speaker's version. c. practice sentences for stress, timing; articulation, intonation and rhythm, compare it with native speaker's version. Students could stop and repeat it many times.	As week 1.
14.	a. As 1a but different examples. b. As 13b but different examples. **Examples:** **Words:** *exports, fastest annual, Prime Minister, revive, shipments, significantly, exporters, expensive overseas, increasingly, profitability, resilient.* **Sentences:** *The misery index is at a three-year low. A wave of downsizing has eliminated thousands of jobs. The market will have a soft landing. The senator said that only in some supply-side fantasy-land could the budget be balanced at the expense of health and education. This is a one-time opportunity for big players. Mutual funds are spawning new shareholders. The stock exchange provides auction agency market representation, transparency, and price discovery. Equities trade locally but gold follows the sun.*	As week 1.	Students were asked by using Accent Master software to: a. listen to two audio advertisements; b. repeat and then record their own voice whilst pronouncing some phrases and compare them with the voice of the native speaker; c. record their speech to compare it with the native speaker's version.	As week 1.

Lesson	Instructor prosody training (10 minutes)	Practice	CAPT (10 minutes for BPI, 20 for CAPT)	Practice
15.	a. As 1a but different examples. b. Role plays: I. asked students to select a dialogue, then assigned parts to the students and had them read the dialogue aloud while I. gave feedback on pronunciation errors. Examples: **Words:** *broadcaster, cautious, social media, impact, wider audience, opposite direction, journalism, multimedia newsroom, internationally, news organizations, professionalized.* **Sentences:** *The aim of counter-cyclical policy is to dampen the business cycle. It's hard to wring inflation out of the economy when you have entrenched inflationary expectations. The rational expectationist school of thought believes people will anticipate and counteract policy moves. The trade deficit is due to an overly strong dollar. The tax cut is producing an economic stimulus but much of it is going overseas. We have a ballooning merchandise deficit.*	As week 1.	Students were asked by using Accent Master software to: a. watch an advertisement; b. repeat and then record their own voice whilst pronouncing some phrases and compare them with the voice of the native speaker; c. record their speech to compare it with the native speaker's version.	As week 1.
16.	a. As 6a but different examples. b. As 15b but different examples. **Example:** *Who would you most like to interview next year? General Stanley McChrystal, the overall NATO commander in Afghanistan. He warned in October 2009 that the situation in Afghanistan was serious, that time was running out, and that the campaign had been under-resourced and under-coordinated in the past. He said that protecting the Afghan people was key. Will he – and most crucially, they – feel that has been achieved, one year on?*	As week 6.	Students were asked by using Accent Master software to: a. watch a short movie (e.g., 3 mins); b retell the story using the same words and the structures in the movie; b. record their speech to compare it with the native speaker's version; c. stop on some key words and watch the wave graph for specific words and compare it with the native speaker's version.	As week 1.

Appendix 2.

One example of the exercises students did in the BPI group through Accent Master software.

Print and review the following paragraph. Mark the stress where you think it will fall. Listen to my reading. After you have listened, you try reading the paragraph while recording yourself; remember to stress the syllables accordingly.

Sometimes, there is a conflict of interest between parents and teenagers. Young people feel the need to rebel, to become separate individuals in their own right. Parents often feel such conduct is not appropriate, especially when their sons or daughters isolate themselves from the family, or when they insult their elders. Young people advocate that they be permitted to set their own limits and not be obligated to follow their parents' "rigid" ideas. However, most parents still prefer to exercise some control over their children until they graduate from high school. Perhaps children should feel fortunate to have parents who are willing to guide their offspring at the risk of losing their affection.

Appendix 3.

Raw scores on pretest and posttest of listening comprehension (and gain) obtained by three groups of 17 interpreter trainees. Participants in each group are ordered from highest to lowest score on the pretest.

Control group				CAPT group				BPI group			
Part.	pretest	Posttest	Gain	Part.	pretest	Posttest	Gain	Part.	pretest	Posttest	Gain
1.	41	42	1	1.	42	44	2	1.	40	43	3
2.	41	42	1	2.	41	43	2	2.	40	44	4
3.	40	41	1	3.	39	41	2	3.	39	42	3
4.	39	40	1	4.	38	41	3	4.	39	43	4
5.	39	38	−1	5.	38	39	1	5.	38	41	3
6.	37	39	2	6.	38	37	−1	6.	38	42	4
7.	36	37	1	7.	35	39	4	7.	37	39	2
8.	36	37	1	8.	35	37	2	8.	35	35	0
9.	34	36	2	9.	34	36	2	9.	35	40	5
10.	33	35	2	10.	33	36	3	10.	34	34	0
11.	33	34	1	11.	32	34	3	11.	32	37	5
12.	32	33	1	12.	32	35	3	12.	32	37	5
13.	32	33	1	13.	32	35	3	13.	32	38	6
14.	31	32	1	14.	32	36	4	14.	31	35	6
15.	31	30	−1	15.	31	33	2	15.	31	35	4
16.	31	33	2	16.	30	32	2	16.	30	33	3
17.	31	32	1	17.	30	32	2	17.	30	35	3

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