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Refining pragmatically-appropriate oral communication via computer-simulated conversations

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ABSTRACT

To address the problem of limited opportunities for practicing second language speaking in interaction, especially delicate interactions requiring pragmatic competence, we describe computer simulations designed for the oral practice of extended pragmatic routines and report on the affordances of such simulations for learning pragmatically appropriate communication. Twelve highly proficient learners of English completed six simulated conversations focused on making requests in academic contexts. Evidence of learning was examined microgenetically by comparing data across the simulated conversations and triangulated by written reflections, surveys, and interviews. Results showed that participants gained content and linguistic forms from expert speaker models, and their interactions in scenario-based simulations indicated greater pragmatic awareness and changes in oral production over time. The majority of participants viewed the program positively, commenting on features such as its authenticity and predictive accuracy.

KEYWORDS

Intelligent computer-assisted language learning; spoken dialogue systems; pragmatic competence; oral practice; simulations

Introduction

Pragmatic instruction in second language (L2) education has become an important research topic since it has been shown to accelerate the development of pragmatic competence (e.g. Bardovi-Harlig, 2001; Jeon & Kaya, 2006; Kasper & Rose, 2002). Provision of authentic input, awareness-raising, communicative practice, and feedback are stipulated as necessary components of pragmatic instruction (cf. Cohen, 2005; Martínez-Flor & Usó-Juan, 2006; Olshtain & Cohen, 1991). Of these, the practice component, and in particular oral practice, has received the least attention in research studies (Taguchi & Sykes, 2013; see Sydorenko, 2015, for a review). The current study contributes to this limited knowledge base and supports the argument that opportunities for oral practice

of pragmatics facilitate achieving automatized and fluent production (DeKeyser, 2007; Segalowitz, 2003).

In the classroom, opportunities for the oral practice of pragmatics are limited and while role-plays are commonly used (see Martínez-Flor & Usó-Juan, 2010, for a review), learners may not take their parts seriously as ‘role play talk is not consequential’ (Bardovi-Harlig & Hartford, 2005, p. 11). Interactions with speakers in the target language community, while valuable, pose different challenges: although many learners benefit from such interactions (e.g. LoCastro, 2011; Sydorenko & Tuason, 2016), others may be apprehensive of or lack access to expert speakers (e.g. Barron, 2003; Duff, 2007; Kuriscak & Luke, 2009; Sykes, Oskoz, & Thorne, 2008). Feedback is also limited: expert speakers may provide *implicit* feedback on pragmatic inappropriateness in the form of social-interactional consequences, but reasons behind such consequences may not be clear to the learner (e.g. Barron, 2003; Kasper, 1997).

Use of technology is one way to overcome the issue of learners’ apprehension of or lack of access to expert speakers in face-to-face communication. Earlier digital tools designed for foreign language pragmatics training include the use of multiuser virtual environments for scenario-based pragmatics instruction, which combine interactive experience with personalized feedback. Primary examples include the learning of apologies and requests in Spanish (e.g. Sykes, 2009, 2013). Recent efforts to provide interactional *speaking* practice include the development of spoken dialogue systems (SDS)¹. (Bibauw, François, & Desmet, 2015); however, only a small fraction of such intelligent computer-assisted language learning programs (iCALL) focus on second language pragmatics (for background on recent developments in iCALL, see Lee et al., 2011). Additionally, existing SDS designed for language learning present certain technological and practical challenges (described below). To that end, we designed video-based computer simulations that allow for oral self-paced practice of extended pragmatic routines in high-stakes situations and examined participants’ learning outcomes as well as their attitudes towards such simulations. Empirically, we focus here on the use of our simulations by international Fulbright Scholars who were highly proficient in English and highly motivated to refine their English further.

Literature review

This literature review focuses on spoken dialogue systems (SDS) for language learning to provide the context within which we developed our simulated conversations (*SimCon*) program. SDS allow learners to have interactive spoken dialogues with ‘embodied conversational agents’ – animated characters that are ‘endowed with conversational capabilities primarily through speech output generation (either synthesized or recorded speech), speech recognition software, and natural language processing’ (Morton, Gunson, & Jack, 2012, p. 2). The

agents can produce not only verbal output, but also paralinguistic cues such as frowning, smiling, hand-waving, and walking away. Due to the limitations of automatic speech recognition (ASR) technology and natural language processing (NLP) algorithms, SDS are generally built around restricted contexts or domains, such as buying a train ticket, so that possible learner input to the system is maximally predicted and speech recognition and feedback error rates are minimized (Eskenazi, 2009; Morton et al., 2012). In the reviews of language learning technologies in general (Golonka, Bowles, Frank, Richardson, & Freynik, 2014) and dialogue-based CALL applications in particular (Bibauw et al., 2015), the consensus is that SDS in its many forms, such as intelligent tutoring systems, games and virtual worlds, spoken dialogue systems, and chatbots, will likely see continuous growth in the future.

Existing SDS include DEAL (Wik & Hjalmarsson, 2009), DISCO (van Doremalen, Boves, Colpaert, Cucchiarini, & Strik, 2016), ISLAND (McGraw & Seneff, 2007), SCILL (Seneff, Wang, & Zhang, 2004), and SPELL (Morton & Jack, 2005, 2010) (see Bibauw et al., 2015, and Eskenazi, 2009, for detailed descriptions of these and other programs). By focusing on SPELL, Morton et al. (2012) illustrate how such programs generally work. For example, ‘in the About Train Times scenario, the virtual character asks the learner some questions about the departure and arrival times of trains in Great Britain. To the side of the character on the screen is a timetable depicting the times’ (Morton et al., 2012, p. 4). Sometimes there are text help menus to assist learners in overcoming potential difficulties. When learners’ utterances are ungrammatical, the virtual character offers implicit spoken feedback, typically in the form of recasts. The use of ASR and NLP technologies allows learners to have interactive oral practice with, and receive feedback from, virtual embodied agents.

Morton et al. (2012) found that learners were pleased with the SPELL program and enjoyed using it, although the ASR component did not work perfectly. Continuing challenges include increasing the accuracy of ASR with non-native accented speech and collecting an adequate number of representative learner responses for cataloguing the potential grammatical errors that could inform the feedback provided (Morton et al., 2012). Although available SDS seem to appeal to learners, we agree with Bibauw, François, and Desmet (2016) that there are two significant problems. First, such systems are either at the prototype stage or they are fully developed but not available to language learners at secondary or postsecondary institutions (e.g. Tactical IraqiTM, as described by Johnson, 2010). (However, see Evanini et al., 2017, for a promising open-source spoken dialogue system for learning pragmatics that may have low ASR error rates; the system is yet to be evaluated for learning outcomes). Second, most systems have not been evaluated for learning outcomes and instead, evaluation has focused on user attitudes. In our view, a third major problem (not mentioned by Bibauw et al., 2016) is that current SDS seem to only be able to handle relatively short user

responses (at the word, phrase, or sentence level). Example 1 below is from Morton et al. (2012), p. 5) and illustrates the system-user interaction.

Example 1.

Virtual Character: Where would you like to go?

Learner: Um.

Virtual Character: I would like to go to Oxford. Where would you like to go?

In the given scenario, the expected user responses are at the most one sentence long. However, in many situations, a pragmatically appropriate response may require elaboration. Example 2 illustrates what a student may say when asking an instructor for a letter of recommendation (the data comes from our own study).

Example 2.

The thing is that I found an AMAZING opportunity for applying uh for a scholarship and I was wondering if you could uh make me a recommendation letter for this application. Uh the only problem is that the deadline is due in three days so uh I will understand if you can't write the recommendation letter in these these days because it's like last minute. But for me it will be very important and and I'm very motivated with this opportunity.

From a conversation analytic perspective, Example 2 is a dispreferred action, which tends to be more elaborate compared to preferred actions and may involve extended explanations and frequent pausal phenomena (e.g. Taleghani-Nikazim & Huth, 2010). Existing SDS do not elegantly manage such extended oral responses and ASR error rates are typically high.

In an attempt to address the issues mentioned above (and specifically, challenges with ASR technology), we developed and evaluated a system that is comparatively simple in terms of design and technology and that enables researchers and teachers with modest technical backgrounds to contribute to content creation within the system. Our system, which does not use ASR and NLP technologies, nevertheless allows for the practice of extended speaking in interaction and focuses on pragmatically appropriate communication in restricted domains, in our case particular requests made by students to instructors. Theoretically, learning in this system can take place via the following mechanisms. First, responses to an interlocutor in a particular situation can be practiced an unlimited number of times: oral rehearsal alone, without any feedback, can lead to improvements in fluency, accuracy, and complexity (see Ellis, 2009). Second, as previous research indicates (Sydorenko, 2015; Sydorenko & Tuason, 2016), language learners can incorporate model input from expert speakers into their production, and do so simultaneously during their interaction with expert speakers. Thus, it was envisioned that similar input incorporation may take place as

learners use *SimCon*. The postulated learning mechanism at play is that learners notice gaps in their production as compared to that of more expert interlocutors (Gass & Mackey, 2015). During repeated practice, learners may notice gaps in their communicative inventory on their own (Sydorenko, 2015; Sydorenko & Tuason, 2016), but feedback in the form of positive or negative consequences and ideas for possible next actions available in *SimCon* may draw learners' attention to additional gaps (see Methodology section for more details). The need for feedback during contextualized oral practice is explained by Lyster and Sato (2013) as follows: 'repeated practice with feedback at propitious moments promotes the acceleration of *meaningful learning* rather than the acquisition of *mechanical skill* (Anderson, Greeno, Kline, & Neves, 1981: 206) and thereby contributes to automatization' (p. 72). Recognizing that feedback during contextualized oral practice is beneficial for language development, but also keeping in mind the practical concern that only implicit consequential feedback is possible within a system like ours, this study examines whether a combination of practice, input, and limited feedback² can contribute to pragmatic development. This case study describes the use of this system by international Fulbright scholars seeking to improve their command of academic discourse in English and addresses the following two research questions:

- (1) What are the learning outcomes from using *SimCon*?
- (2) What are the learners' perceptions of learning outcomes and attitudes towards *SimCon*?

Method

A qualitative case study approach was taken in this research. Although such studies are limited in that generalizations cannot be made from a particular case to the general population, they allow study of the phenomenon in question and how it applies to the particular case in detail (Mackey & Gass, 2005). In an exploratory and largely descriptive study like ours, we find it useful to begin with the investigation of a particular case in order to both assess learning outcomes and user attitudes and to iteratively improve and extend our program.

Participants

The participants were twelve learners of English, all Fulbright scholars in the USA from 10 different countries and all with advanced levels of proficiency³. Their first languages were Arabic (5), Burmese (1), Pashtu (1), Spanish (3), Turkish (1), and Vietnamese (1). Five were female and seven were male. They were 23–37 years of age, with an average age of 29.

The learners were enrolled in a six-week program hosted by an Intensive English Program at a US university. The program, sponsored by the US Department of State Bureau of Educational and Cultural Affairs and administered by

the Institute of International Education, was designed to prepare the learners for the academic and cultural environment of English medium graduate school.

The Fulbright scholars were chosen due to their advanced proficiency: our pilot studies indicate that intermediate-level learners had difficulty with the listening comprehension of fast-paced videos presented within *SimCon*.

Description of Simcon

We will first describe how the computer-simulated conversations work and then explain how they are different from existing SDS.

Each simulation begins with a scenario description, as depicted in [Figure 1](#).

The first step for learners is to watch the video that initiates the simulation. This scenario begins with a video of an instructor who is typing on the computer in his office. Next, learners record their spoken response to the video they have just watched. For example, one of our participants said ‘Hi Dan. Can I come inside?’ After this, learners are taken to the next screen, where they can play back the response they have just recorded (if they wish) and select the option

You are a student. You have just recently learned about an opportunity (scholarship, job, something else) that requires a letter of recommendation as part of the application. **Take a minute to think and imagine what this opportunity could be.** Unfortunately, the letter of recommendation is due in **3 days**. You approach one of your instructors during their regular office hours, hoping to get a letter of recommendation. In this course, you have displayed an **excellent** academic performance and **regular** course attendance. Your instructor's name is Dan Gordon.

Figure 1. Screenshot of video 1.

Figure 2. Screenshot of the response options after video 1.

that best matches the action they have just completed (see [Figure 2](#)). In the case of this particular learner, it should be ‘You greet the instructor and ask if you can come in.’ Note that response options are possible actions, not possible verbatim statements; this constitutes feedback to learners on possible actions after each video.

The program then takes learners to the video that corresponds with their selection – in this case a video in which the instructor says ‘Yeah, definitely. What can I do for you?’ (see [Figure 3](#)). Connections between response options chosen and the next videos that appear constitute feedback in the form of consequences to learners’ actions.

After this, learners proceed in the same stepwise fashion as described above, alternating between video watching, responding, and selecting from a list of possible options, until they reach the end of the conversation. Conversation paths differ between learners; thus, some learners may reach the end of the conversation earlier than others, depending, for example, on how soon they make their request after initial greetings.

Comparison of Simcon and SDS

As summarized in [Table 1](#) (below), SDS include ASR. Our system does not; instead, users select from among the available text-based options the one that best matches the action implicated in their previous oral response. Second, SDS include an NLP component which is responsible for making the system interactive. In our system, in lieu of the NLP technology, the conversation paths are predetermined by the researchers who designed them based on several rounds of pilot testing, and we can augment possible conversational paths as we continue to develop the program. Both our system and SDS employ embodied

You are a student. You have just recently learned about an opportunity (scholarship, job, something else) that requires a letter of recommendation as part of the application. **Take a minute to think and imagine what this opportunity could be.** Unfortunately, the letter of recommendation is due in **3 days**. You approach one of your instructors during their regular office hours, hoping to get a letter of recommendation. In this course, you have displayed an **excellent** academic performance and **regular** course attendance. Your instructor's name is Dan Gordon.

Record

Stop

Figure 3. Screenshot of 'Yeah, definitely. What can I do for you?' video.

conversational agents: in SDS they are usually animated characters that can provide verbal and non-verbal feedback; in our system, they are video-recordings of actual people. We believe that videos of actual people increase social presence and make embodied conversational agents more authentic (compared to animated characters). Both types of systems are adaptive; that is, the embodied conversational agents' output is based on user input. Both types of systems provide immediate feedback, although in different forms. SDS often utilize the reformulation of users' incorrect utterances as recasts. As stated above, our computer-simulated conversations provide implicit feedback in the form of lists of possible

Table 1. Comparison of common features in spoken dialogue systems and Simcon. .

Feature	Spoken dialogue systems	Simcon
ASR	Yes	No
NLP	Yes	No
Database of possible responses	Yes	Yes
Users' oral input	Yes	Yes
Embodied conversational agent	Yes (animated characters)	Yes (video-recorded people)
Adaptive	Yes	Yes
Provision of immediate feedback	Yes	Yes
Technological expertise needed	Yes	No

actions following each video, while subsequent videos represent consequences of users' actions. What distinguishes the two types of systems is that expertise in ASR and NLP is needed to create content in SDS. However, our system does not require technical knowledge for the creation of content. (By contacting the corresponding author, interested researchers and teachers can gain free access to our program.)

Materials

Learners were first given a handout consisting of questions on participants' knowledge and experience with student-instructor interactions in the USA. Some questions asked specifically about prior experience asking for a letter of recommendation. These questions constituted a warm-up phase of the workshop, with the goal to activate participants' relevant schemata (i.e. background knowledge) before the practice phase.

SimCon program constituted the second set of materials in this study. To familiarize themselves with the program, participants were asked to complete one practice simulation called Job Interview. Next, participants completed six simulations that focused on the request for a letter of recommendation from an instructor, but simulations 1 and 2 differed in the timeframe of the request (letter due in three days or one week, henceforth referred to as Three Days Simulation and One Week Simulation) and the characteristics of the student (average or excellent academic performance)⁴. The request scenarios in simulations 3 and 4 were the same, except participants played instructor roles: this provided participants with videos of possible student models. Simulations 5 and 6 were identical to 1 and 2; thus, when responding as students, participants practiced the Three Days Simulation and the One Week Simulation twice.

To clarify, participants could learn from models in the following way. First, they recorded their responses as students in simulations 1 and 2; then they heard model student responses in simulations 3 and 4; finally, they could incorporate information from model student responses in their subsequent production in simulations 5 and 6.

Instruments

To examine changes in learners' oral production, the study utilized a pretest-posttest design: participants' responses to simulations 1 and 2 served as pretests, and responses to simulations 5 and 6 served as posttests.

We also conducted surveys and interviews. After completing the simulations, learners were given a survey which consisted of yes/no and open-ended questions on what they had learned from the simulations, whether their perceptions of student-instructor interactions in the USA had changed, and what they thought about the simulations program (effectiveness, ease of use, authenticity, and the like).⁵ Of all participants, five who volunteered also completed 30-

minute interviews, in which they were asked follow-up questions about their responses to the survey.

Procedures

The study took place over the course of two and a half hours. The procedures are illustrated in Figure 4. The interviews were conducted within three days of the conclusion of the study.

Data analysis

We analyzed our data for (1) evidence of learning outcomes and (2) learners' perceptions of learning outcomes and opinions about the simulations program. When analyzing the data for learning, we adopted a microgenetic approach, which is used for tracking qualitative changes in cognition and performance over a short period of time (hours, minutes, or seconds) (van Compernelle, 2011). In our study, we examined changes learners made in oral requests for a letter of recommendation within a two-and-a-half-hour time frame. If learners' changes in oral production became more congruent with the system's models (i.e. student videos), we considered those to be positive learning outcomes as the model student videos had been vetted as pragmatically appropriate.

Studies examining structured practice of pragmatic routines found that learners could focus on both linguistic form and the content of their responses (Sydorenko, 2015; Sydorenko & Tuason, 2016). We thus categorized changes made into two categories: form or content. Evidence of focus on form⁶ was operationalized as learners' use of expert language from the model videos in posttest simulations 5 and 6. Following Sydorenko (2015), changes in any forms, including not only pragmatically appropriate expressions like *I really appreciate it*, but also vocabulary and morphosyntax, were examined because linguistic competence and pragmatic knowledge are connected (e.g. Roever, Fraser, & Elder, 2014). For example, if learners used the video-modelled expression *relevant information* in posttest but not in pretest simulations, it was counted as a form change. Following Sydorenko (2015) and Kondo (2008), evidence of change in content was determined by participants' use of content (typically,

Figure 4. Study procedures.

sociopragmatic strategies) similar to the model videos. For example, if a participant added an explanation for their late request in the posttest, and if an explanation was present in model videos, this was coded as change in content.⁷ Learners can make changes to their production due to practice alone (e.g. Ellis, 2009) or due to additional input presented to them during practice (e.g. Kondo, 2008; Sydorenko & Tuason, 2016). In our study, both were possible. We use the terms *personal* forms or content for changes due to practice alone (i.e. those forms and content that do not appear in models) and *model* forms or content for changes influenced by the models.

To better understand the results of the learning outcomes, we triangulated our data by including learners’ responses from the surveys and interviews (see Sydorenko & Tuason, 2016, for a similar approach to data triangulation). We conducted content analysis (Creswell, 2003) by first broadly categorizing participants’ written and oral comments into Learning Outcomes and Attitudes categories, and then coding for themes within each category. The coding for themes was data-driven rather than *a-priori*.

Results

Research question 1: what are the learning outcomes from using SimCon?

For the Three Days simulation, there were a total of 7 model form changes and 35 model content changes (see Table 2). There were fewer personal changes: 0 form and 11 content. There was also variability among participants on the number of changes made. For example, model form changes ranged from 0 to 5 per participant. The results were similar for the One Week simulation: most changes were model content (48), followed by personal content (12), model form (7), and personal form (3). Again, there were more model than personal changes, as well as variability among participants.

It is notable from the results that participants adopted content from models at a much higher rate than form. Additionally, the occurrence of personal changes was much less frequent than those from models, suggesting that although some participants benefited from practicing the simulations without attending to model input, the models accounted for the changes in their production to a much higher degree.

Table 2. Changes between pretests and posttests.

	Model		Personal	
	Form	Content	Form	Content
Three days simulation				
Total	7	35	0	11
Range	0–5	1–5		0–3
One week simulation				
Total	7	48	3	12
Range	0–2	0–8	0–2	0–2

Next, we provide more descriptive findings regarding changes learners made. To refer to individual participants, we use the format ‘FB#.’

In terms of form, common words or expressions adopted from models were: *thank you for your consideration*, *unfortunately*, *found out*, and *relevant information*. Interviews with participants suggest that these forms were likely known to participants but may not have been part of their active schema related to making a pragmatically sensitive request for a rushed letter of recommendation. At other times, participants replaced target-like forms they originally used with the synonymous ones from the models. For example, some said ‘I recently learned about’ and after the models stated ‘I recently found out about.’ Other participants added a word or a phrase to their post-model response, like *unfortunately*, thereby refining their original response rather than changing it completely. The three instances of personal form changes were linguistic reformulations of the same request strategies. For example, FB9’s original explanation was ‘the scholarship unfortunately is really important for you- me’ and on the second try this explanation was changed to the linguistic form ‘it’s very crucial for me.’

With regard to content, appropriation from models was generally in the form of sociopragmatic strategies; particularly common were:

- *appealers* (i.e. an effort by a speaker to appeal to the hearer’s benevolent understanding), such as ‘It’s important for me in the finance way;’
- *disarmers* (i.e. when ‘the speaker tries to remove any potential objections the hearer might raise upon being confronted with the request’ (Blum-Kulka, House, & Kasper, 1989, p. 287)), such as ‘I really understand your situation and I know it’s pretty short notice;’
- *grounders* (i.e. reasons for the request), such as ‘It’s very related with the class that we are taking now.’

(Definitions of strategies commonly used in cross-cultural requests were drawn from Blum-Kulka et al., 1989; Sydorenko & Tuason, 2016; Taguchi, 2012).

What moved participants closer to expert speaker models was not only the adoption of strategies from models, but also the elimination of initially used and often inappropriate strategies which did not appear in the models. For example, FB9 used a moralizing strategy on take 1, which is considered generally impolite in requests: ‘I know that two weeks should be the minimum requirement, but you know what? Their their requirement is I need to be sent in one week.’ This strategy was absent on take 2.

Although participants adopted content from models at a high rate, their initial requests were already rather polite. However, there were noticeable improvements in responses to instructor’s rejection. For example, on take 1, many participants provided short responses, generally follow-up requests, after the instructor rejected their first request. On take 2, participants often provided

longer post-rejection responses that included additional strategies, such as appealers and disarmers.

Notwithstanding improvements, not all discourse-pragmatic changes were necessarily positive. Some participants used unsuccessful imposition minimizers, such as statements that they will send all the necessary information to the professor, thereby reducing their work. This may serve as an imposition minimizer in other cultures; however, in the USA it is expected that students asking for a letter of recommendation will provide the additional information.

Another mixed and nuanced outcome was when some participants changed their initial requests that sounded non-target-like but genuine and polite to more target-like but perhaps less genuine. One such case is FB16 who in take 1 used non-target-like appealers ('I found an AMAZING opportunity' and 'I'm very motivated with this opportunity') as well as a genuine-sounding offer of retreat⁸. ('I will understand if you can't write the recommendation letter in these these days because it's like last minute'). In take 2, a different appealers, 'I have many chances to get this scholarship,' sounded rather bold. In the model, the native speaker phrased a similar sentiment more indirectly as 'I recently found a scholarship that it looks like I have a pretty good chance to get,' which, due to hedging, sounds more polite and less like hubris. To summarize, while our participants were able to notice the common strategies used by native speakers in the models and apply them generally appropriately, without repeating them verbatim, learning the nuances of pragmatically appropriate requests remained developmentally in-progress for some participants.

Research question 2: what are the learners' perceptions of learning outcomes and attitudes towards SimCon?

Perceptions: evidence from surveys

As will be shown below, learners' perceptions are congruent with the results of Research Question 1 that participants focused more on content than on particular forms or phrases. The learning outcomes reported by the participants relate to principles of polite communication with instructors in general and when asking for a letter of recommendation in particular (see Table 3). In the former category, some participants realized that when talking to instructors in the USA, office hours should be utilized, particular greetings should be used, and instructors seem to be non-judgmental. In the latter category, many learning outcomes relate to pragmatic strategies that participants began to utilize more in post-model simulations, such as grounders, appealers, and imposition minimizers. Participants also reported observing the organization of request sequences, such as providing details before making the request, and several referenced learning additional strategies to use after a rejection. One participant stated that they did not learn anything new per se, but a confirmation of their original ideas for how to approach the given situation was nevertheless valuable.

Table 3. Learning outcomes reported on handouts and in interviews.

Category	Examples	Handout comments (N = 12)	Interview comments (N = 5)
	General interactions with instructors		
General etiquette	Utilize office hours, use a proper greeting	1	
Instructor characteristics	They do not judge	1	
Student behavior	Be patient, be polite, show consideration for instructor's time	4	1
	Request for a recommendation letter		
Time frame	Try not to ask too soon, recognize it will be a factor, apologize for a last-minute request	7	1
Rejection	Be ready for a rejection, respond politely, can make a request again	3	2
Importance	Explain why the letter is so important, show your ambitions	3	
Sequencing	Make your request gradually, take several turns, use small talk	3	1
Details	Provide clear reasons for the request, provide enough details	3	3
Other factors that can affect outcome	Attendance, grades, relationship, way of asking	4	
Confirmation	Confirmation of one's initial thoughts	1	

Perceptions: evidence from interviews

The interview results corresponded to the learning outcomes participants stated on the survey (see Table 4). Participants did not state any additional learning outcomes, but rather elaborated on the ones they had mentioned on the survey. During the interview, they had difficulty remembering which specific words or expressions they learned from the program. However, when the interviewer pointed out the changes that the participants made between take 1 and take 2, participants agreed that they had adopted those ideas or phrases from the videos and explained why they noticed them. Learners said they were aware of the gap between their initial performance and the models in the videos, and that they

Table 4. Survey results.

Question	Yes	Mostly yes, but...	No
Would you use the program again? Why?	7	2 Need to include more topics	2 I prefer real-person interactions; I prefer asking instructors how to deal with various situations
Do videos represent real-life interaction? Please explain.	9	2 Experience talking to a real person can be a bit different; need to add more variability in possible responses and outcomes	
Was it easy to choose an option matching your oral response? Please explain.	8	2 It was difficult only at the beginning, when learning how the program works; it was difficult only in one case	1
Did your responses and following videos matched? How did you feel about that?	7	2 They matched except when I forgot to mention some important details; overall it was fine	2 This made me feel I didn't answer correctly; I was confused

were looking for relevant expressions to adopt. FB12 said ‘There are some technical words if you want, like a way to say,’ and she tried to remember those ‘technical words’ from the models.

In summary, the main learning outcomes were the adoption of content, particularly sociopragmatic strategies, and less so of linguistic forms from expert speaker models. The outstanding challenge for learners is to understand and internalize how to adopt the strategies that appear in the models in a pragmatically appropriate way. While we found ample evidence for greater awareness of pragmatic strategies as well as specific changes in form and content, fully proceduralizing pragmatically appropriate requests is a long-term developmental process that may require a variety of structured and unstructured practice opportunities.

Attitudes: evidence from surveys

Eleven of the 12 participants completed this part of the survey. The results to Yes/No questions (and explanations learners provided for the ‘mostly yes’ or ‘no’ answers) are presented in Table 4.

Seven participants said they would use the program again. As one person explained, the program helped raise their awareness: ‘It was really interesting because we never actually realize how our performance and attendance in classes can affect our future, with something as simple as a recommendation letter request.’ Two people stated they would use the program again as long as it included more topics, and two would prefer to learn about student-instructor interactions in other ways. In summation, nine of 11 respondents (82%) were positive about the program and found it useful for their pragmatic development.

Our simulations also appear authentic to learners: nine participants thought videos represented real-life interaction, and two thought that this was mostly the case. Statements such as ‘I was nervous, I placed myself in the situation and it is not easy to ask for such a request in a polite and kind way’ and ‘I felt as if I am really in a true and not virtual situation’ are representative of the data. Ten participants felt it was easy or mostly easy to choose an option that matched their oral response, and one found this process difficult. For nine participants, the responses and the following videos matched or mostly matched; for two participants, they often did not match, which made participants feel confused or that they said something incorrectly. In terms of our continuing effort to improve the simulations, getting few or no mismatches between participants’ responses and following videos is important as it influences how the participants feel about their interactions.

Other reported opinions were that students gained confidence through practice in pragmatically difficult and specific situations, especially in responses to refusals, as well as from seeing possible examples of student and instructor responses. Several participants valued seeing how consequences change in different circumstances.

Attitudes: evidence from interviews

The results of the interviews regarding participants' opinions corroborate survey results. Four of the five participants said they would use the program again. The one person who said she would not use it, FB13, explained that she is an outgoing person and would rather practice face-to-face. However, she also thought that shy individuals would benefit. Participants described the videos as authentic (FB16) and the program as easy to use (FB1, FB13). They liked practicing speaking (FB1, FB12, FB16), particularly in a virtual, and thus safe, environment (FB12, FB16, FB19). Two participants were impressed that directions of the conversation matched their expectations (FB1, FB12). When asked what was helpful for learning, participants mentioned features such as the lists of response options which gave them additional ideas (FB1, FB19), the ability to play back their recordings (FB19), and getting feedback by comparing their responses to the model ones (FB19). Some suggestions for improvement were to provide more training on how the program works (FB16), include guiding materials on pragmatics before the simulations (FB16), and include more possible discourse options and branching narratives (FB19).

Discussion

Research question 1: what are the learning outcomes from using SimCon?

First, learners noticed and adopted content from models that differed from their original production. Generally, participants incorporated pragmatically appropriate strategies into their subsequent discourse, such as new or additional appealers and disarmers, and displayed a better understanding of cultural aspects of making requests in American English. However, some learners employed strategies less successfully, such as in the aforementioned imposition minimizer example. This variability may be due to differences in the levels of cultural knowledge and pragmatic and linguistic competence. For example, survey results indicate that some learners were aware of appropriate timeframes for a letter of recommendation request, while others were surprised that one week's notice was not enough. Participants' TOEFL scores also varied somewhat, which is an indication of differences in linguistic knowledge. Additionally, there are a variety of 'learner characteristics such as motivation, aptitude, and language learning history that affect what learners notice and become aware of when processing L2 input' (Schmidt, 2010, p. 721). The fact that students were capable of learning pragmatically appropriate communication from models corroborates prior research (Sydorenko, 2015; Sydorenko & Tuason, 2016), while some unsuccessful use of strategies from models suggests, as some participants stated in surveys and interviews, that feedback is valuable when input-in-interaction alone is insufficient (e.g. Cohen, 2005; Holden & Sykes, 2013; Kasper & Rose, 2002; Lyster & Sato, 2013). Our findings also support Cohen's (2005) idea that learners can be effective input analyzers if they are focused on looking for

differences between the interactions involving expert speakers and their own production. Even though the learners in our study were involved in the cognitively demanding task of producing student responses and then hearing model student input while producing instructor responses, they were able to incorporate input from the model student videos into simulations 5 and 6. However, as we examined a specific case of motivated⁹ and high achieving Fulbright scholars, this ability to notice and remember during interaction should be further investigated with diverse populations of learners.

With regard to learning forms and content through structured practice, this study showed that learners primarily focused on content. In this sense, findings correspond to previous research illustrating that when tasks are about conveying meaning, learners tend to focus on content (Lyster, 2007; VanPatten, 2004). The shortness of intervention could also be a factor: given the cognitively demanding task of noticing/remembering/incorporation of forms into subsequent production over a time gap, learners may not have been able to devote significant attention to form within only a short practice period. While use of target-like pragmalinguistic forms in appropriate sociopragmatic contexts is an indicator of increased pragmatic competence (e.g. Roever et al., 2014), findings of Sydorenko, Maynard, and Guntly (2014) and Hendriks (2010) indicate that expert speakers can sometimes place more importance on the cumulative effect of an extended request and, for that reason, disregard one or two less polite forms when judging the appropriateness of learner requests. In light of prior research, even though form changes were minimal, our participants' heightened awareness of the general principles of polite communication with instructors, as well as adoption of specific pragmatic strategies, is a valuable learning outcome.

Impressionistically, we noticed a few other relatively rare changes that the current study was not designed to measure. These included changes in intonation patterns where participants sounded excited (or not) to greet the instructor or disappointed versus understanding about the outcome. Other participants appeared more fluent in subsequent simulations, especially when responding to a rejection. Since intonation contributes to pragmatic appropriateness (e.g. Félix-Brasdefer & Koike, 2012), and oral practice can lead to more automatized and fluent production (DeKeyser, 2007; Segalowitz, 2003), future studies may want to examine students' use of appropriate intonation and their increased fluency as potential learning benefits of *SimCon*.

Research question 2: what are the learners' perceptions of learning outcomes and attitudes towards *SimCon*?

Participants' perceptions that they focused primarily on content, and specifically sociopragmatic strategies, and less on form, were congruent with the findings

from the pretest and posttest data; thus we do not elaborate on them in the discussion of Research Question 2. Other learning outcomes reported on surveys and interviews were confirmation of one's original thinking of how to approach the situation, and thus gaining confidence. Students especially reported an increase in confidence after experiencing a rejection and felt more prepared for responding to rejections in the future. Since apprehension of communicating with expert speakers is one of the challenges to developing pragmatic competence (Barron, 2003; Kuriscak & Luke, 2009), we see an increase in confidence as an important benefit.

The results of students' attitudes are encouraging since 82% of participants would use the program again. As several participants mentioned, an individual's personality (e.g. shy versus outgoing) is a factor. Anyaegbu, Ting, and Li (2012), Gonzalez (2013, Stracke (2007), and Sydorenko (2011) similarly reported that participants' individual characteristics influenced their attitudes towards specific technologies.

Participants also generally felt that the interactions were quite authentic, many stating that they felt nervous even though they were not having interactions with actual people. This supports Johnson and Wang (2011) who reported that when talking to computerized tutors, participants felt they resembled real interactants. That is, people potentially perceive interactions with virtual conversational agents as similar to interactions with real people, and this can inform aspects of interactive program design. Lastly, numerous participants were surprised that the various possible narrative options were so well predicted. This suggests that a variety of other interactive simulations, based on extensive pilot testing, could be developed. However, it is helpful to remember that investigations of self-study with CALL suggest that independent learners require some instructor support (e.g. Mozzon-McPherson, 2007; Stepp-Greany, 2002) and benefit from employing self-monitoring strategies (Chang, 2007). Thus, notwithstanding the structured nature of the program, some instructor facilitation may be advisable even for self-regulated learning.

Conclusion

Given that our participants reported gaining more confidence with student-instructor interactions in general and learning specific content and forms for interacting in particular situations, we envision that this program could be used to introduce newly-arrived international students to simulated interactions with instructors to build their confidence in approaching instructors with real concerns. Additionally, versions of the simulations program in other languages could be developed to help prepare study abroad participants for successful academic communication during their sojourn abroad.

The program appears to be suitable for learners with more advanced levels of proficiency. Survey results in our pilot studies indicate that intermediate-level

students may struggle with listening comprehension and hence may have limited capacity to learn pragmatically relevant material from the simulation videos. Future studies could investigate whether captioned videos or explicit expositions of pragmatic awareness strategies could be used as help options for such learners. As with most educational tools, this program is not a one-size-fits-all solution. As learners indicated, the perceived value of this program is enmeshed with their individual personalities and how much they feel they can benefit from virtual rather than face-to-face practice.

Given the preponderance of positive attitudes towards such simulations and sizable learning outcomes, but at the same time some unsuccessful adoption of input, the next step is adding more feedback mechanisms to the program in order to maximize learning outcomes. Feedback after each simulation could be in the form of generalities: common pragmatic mistakes, overall principles of polite communication in a given culture, specific polite phrases for a given situation, and the like. However, learners should also be made aware of the individual, contextually situated, and social-relational nature of human interactions (Holden & Sykes, 2013). Studies that evaluate such added feedback mechanisms and examine learning outcomes from long-term interventions, including those that use control groups, would add to the current knowledge base. Finally, the program should be evaluated with a variety of learner groups that differ in proficiency, motivation, and prior knowledge.

As with most exploratory studies, our study is not without limitations. A small sample size (12 participants), a broad age range (23-37), and a relatively short intervention (2.5 hours) impact the generalizability of our findings. Thus, as in every case study, the results should be interpreted as observations in the given context.

In closing, we reference John Du Bois, who describes grammar as a fundamental aspect of human communication while noting that ‘meaning and pragmatic force are at the heart of discourse’ (2003, p. 47). Both of the elements of grammar and discourse pragmatics are essential, yet instructed language contexts typically emphasize the former. Our aspiration is to continue to develop structured opportunities for practicing high frequency and high stakes communicative actions in settings that make visible and learnable the wedding of form, content, and pragmatics.

Notes

1. Spoken dialogue systems simulate an oral interaction on a particular topic between a user and an animated character.
2. We use the terms *limited feedback* and *minimal consequential feedback* because the feedback is implicit in *SimCon*. This conceptualization of feedback was guided by Holden and Sykes (2013), who show that consequences of users’ actions in virtual reality games constitute pragmatic feedback to the learner. Additionally, since our participants stated that the lists of possible actions following their response prompted them to experiment with a different action in their subsequent response, we consider this feature of the program as feedback to the learner.

3. Ten participants' TOEFL iBT scores ranged from 81 to 89; participant's FB13 TOEFL score was 72; one participant's IELTS score was 6.5. Thus, all but participant 13 met or exceeded entrance requirements for graduate programs at the U.S. university where their Fulbright program took place.
4. Our goal was to put learners into high-stakes difficult situations. Both situations were deemed difficult by linguistics students (native and near-native speakers). We did not compare task difficulty of various simulations.
5. Survey questions pertinent to this paper are presented in more detail in the Results section.
6. Using Long's (1991) definition, focus on form is a meaning-focused activity with implicit attention to form; contrastively, focus on forms involves the teaching of individual language items, such as a past tense morpheme *-ed*.
7. While one categorization could have been changes in form versus changes in sociopragmatic strategies, sociopragmatic strategies was too narrow of a category for our data. For example, some learners stated a reason (a sociopragmatic strategy) in pretest simulations and stated a different reason in posttest simulations. While this would not constitute a change in sociopragmatic strategies, it is change in content. The content/form division was chosen because it has theoretical grounding in cognitive approaches to SLA. For example, Lyster (2007) argues for a counterbalanced teaching approach where both form and content are the focus of instruction, though at different times. We also note (and as pointed out by one of the reviewers), separating form from content is more challenging in pragmatics.
8. This term was used by Warga (2008).
9. There are several reasons to believe that the participants were highly motivated: (1) they were the top candidates in their respective countries for the Fulbright Scholars program; (2) they were older than traditional ESL students and had prior work and professional experience, with many of them leaders in their academic or professional fields; (3) all students were admitted into Master's or Doctoral programs in the USA; and (4) the students chose to participate in this study for an additional learning opportunity (based on students' reports) even though, due to scheduling constraints, the study took place during their scheduled and paid for dinner.

Disclosure statement

No potential conflict of interest was reported by the authors.

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