Language Teaching (2026), 1–21
doi:10.1017/S0261444826101463

CAMBRIDGE UNIVERSITY PRESS

REPLICATION RESEARCH

Learners' beliefs about teachers' social characteristics influence their pronunciation preferences: A replication and extension of Hayes-Harb, Barrios & Tripp (2022)

Shannon Barrios and Rachel Hayes-Harb

Department of Linguistics, University of Utah, Utah, USA
Corresponding author: Shannon Barrios; Email: s.barrios@utah.edu

(Received: 23 April 2026 UTC; accepted: 10 September 2026 UTC)

Abstract
Learners' beliefs about language and language users impact the inferences they make about linguistic structure as well as their learning outcomes. In previous work, we found that participants preferred speech samples exhibiting a pronunciation pattern that was associated with a 'teacher' over that of a 'student' in a simulated language classroom context, indicating that language learners differentially weight their input based on characteristics of the speaker. We first replicated this study with a new pronunciation pattern (Experiment 1) and then extended the work by investigating whether preferences for the teacher's pronunciation can be modulated by attributing 'favorable' vs. 'unfavorable' social characteristics to the teacher regarding their teaching experience, teaching effectiveness, and linguistic background (Experiment 2). We found that participants still tended to prefer the teacher's pronunciation, but that the degree of preference was reduced when the teacher had been characterized unfavorably. We thus provide evidence that preferences for speech input from teachers are modulated by beliefs about the social characteristics of the teacher, presenting a challenge for asocial models of pronunciation learning and contributing to our understanding of linguistic stereotyping and its impact on language teaching and learning.

Keywords: input; phonology; pronunciation teaching; social factors

1. Introduction

Language learners acquire a new language's phonetic and phonological patterns from highly variable input. Here we investigate input variability associated with individual talkers – and in particular the consequences of the social characteristics associated with these talkers – on adults' acquisition of the pronunciation of a new spoken language. While it is well-known that speech perception is shaped not just by the (auditory) input but also by who we think we are hearing (Tripp & Munson, 2021), relatively little research has considered how adult language learning is impacted by the social characteristics of the individuals who are the source of learners' language input.

In the language classroom setting, learners may experience input from teachers and from other students, raising questions regarding how learners' beliefs about accent and pronunciation authority shape their preferences among the multiple input sources available in the language classroom. In Hayes-Harb et al. (2022), we developed a study paradigm to investigate the hypothesis that listeners will prefer a pronunciation pattern exhibited by a 'teacher' over that of a 'student' in a simulated language classroom. Participants were told that they would be observing a language class where students are learning new vocabulary and that they would hear both the 'teacher' and a 'student' pronounce the new words. In the experimental conditions, the speech samples varied systematically

© The Author(s), 2026. Published by Cambridge University Press. This is an Open Access article, distributed under the terms of the Creative Commons Attribution licence (http://creativecommons.org/licenses/by/4.0), which permits unrestricted re-use, distribution and reproduction, provided the original article is properly cited.

https://doi.org/10.1017/S0261444826101463 Published online by Cambridge University Press

in the voice onset time (VOT) duration[1] of word-initial voiceless stop consonants depending on the source of the input ('teacher' or 'student'). Speech materials were synthetically manipulated to produce two 'accents' contrasting in VOT duration: 25 msec vs. 125 msec. Following the class observation phase, participants were asked to select which of two speech samples produced by a new talker sounded 'better.' One option resembled the teacher's accent and another the student's accent heard during exposure. As predicted, participants preferred productions matching the teacher's accent. While this may seem like an intuitive finding, it is not predicted by dominant asocial models of language learning and provides strong evidence that any understanding of input must take speakers' social characteristics – and learners' sensitivity to them – into account. Furthermore, to our knowledge, this is among the first experimental findings directly implicating social perception in adult learning of accent. For this reason, it is essential that we confirm the robustness of the pattern via replication studies.

Our first goal in the present study is thus to perform a close replication (Porte & McManus, 2019) of Hayes-Harb et al. (2022). We modified a single variable (the pronunciation pattern exemplified in the materials), providing an opportunity to determine whether the original study's findings are generalizable to new speech materials. The teacher preference effect reported in the original study was quite small, possibly due in part to the subphonemic status – and thus low perceptibility – of the VOT pronunciation contrast they used. Here we created a word-initial /s/–/z/ pronunciation contrast, which we expected to be relatively more perceptible to English-speaking participants due to the phonemic status of /s/ and /z/ in English. We therefore hypothesized that this new contrast would produce the same preference for the teacher's accent, but with a larger effect size. One rationale for attempting to increase the effect size of participants' teacher preference is to provide the conditions needed to pursue our second goal, which is to investigate whether the degree of preference for the teacher's accent is sensitive to social characteristics attributed to the teacher. A larger preference effect for the teacher's accent over that of the student allows us to test whether manipulating the teacher's social characteristics will modulate the degree of this preference.

Language learners typically identify pronunciation as among the most important contributors to their ability to communicate in a new language (Nguyen et al., 2021). Learners demonstrate awareness of the social desirability of so-called 'native' pronunciation, often expressing a preference for 'native speaker' teachers (Gurkan & Yuksel, 2012; Lasagabaster & Sierra, 2002; Watson Todd & Pojanapunya, 2009). This is unsurprising given the prevalence and consequences of accent-based discrimination for language learners. For example, speakers with 'nonnative' accents may be perceived as less professional (Piccolo & Baese-Berk, 2022), less employable (Deprez-Sims & Morris, 2010), and less competent communicators (Nelson et al., 2016) than speakers with 'native' accents. Accent bias also has detrimental consequences for the perceived credibility of eyewitness accounts (Frumkin, 2007), in jury verdicts (Cantone et al., 2019), and in access to housing (Purnell et al., 1999). This bias is similarly observed in language teacher recruitment and hiring practices. For example, recruitment materials in the global English language teaching industry show a preference for White 'native English speakers' from predominantly White, English-speaking countries (Ramjattan, 2019; Ruecker & Ives, 2015). For these reasons and others, the idealized standard of the racialized 'native speaker' is ubiquitous in language teaching and learning (von Esch et al., 2020).

In addition to noting that learners value teachers whose pronunciation and visual presentations are consistent with their expectations of 'native speakers,' Levis et al. (2017) report that students value teachers with training and experience in teaching pronunciation. Indeed, the teacher characteristics of 'native speakerhood,' teaching experience, and teaching effectiveness are widely documented as valued by learners across language learning contexts (Hismanoglu, 2019; Ling & Braine, 2007; Park & Lee, 2006). In Experiment 2, we investigate the combined effect of these teacher characteristics on participants' preferences for the teacher's accent by manipulating the characteristics attributed to the teacher via 'favorable' vs. 'unfavorable' vignettes. The following are the research questions addressed in this study:

https://doi.org/10.1017/S0261444826101463 Published online by Cambridge University Press

- Do participants prefer the accent of a teacher relative to that of a student peer in an artificial language learning setting? (Experiment 1; close replication of Hayes-Harb et al., 2022).
- Are preferences for the teacher's pronunciation relative to that of a student influenced by 'favorable' and 'unfavorable' vignettes regarding the teacher's characteristics (language background, teaching experience, teaching effectiveness)? (Experiment 2; extension of Hayes-Harb et al., 2022).

2. Experiment 1

Experiment 1 is a close replication of the study reported in Hayes-Harb et al. (2022). Hayes-Harb et al. (2022) demonstrated a very small but significant teacher preference effect in what they called the 'experimental conditions,' where the teacher and the student produced systematically different accents (short vs. long VOT durations). They also included 'control conditions,' where the teacher and student produced the same accent, though these conditions did not directly address their research question, which was answered by performance in the experimental conditions alone. For this reason, we replicate only the 'experimental conditions' of the original study.

Experiment scripts, anonymized data, and analysis scripts are available at: https://osf.io/uw8y5/ (original study) and https://osf.io/8nu2p/ (current study).

2.1. Methods

2.1.1. Participants

The population of interest in this replication study is the same as in the original study; however, due to a much larger effect observed here, we recruited a much smaller participant sample. The smaller sample permitted us to collect data exclusively from the Linguistics Department study pool at the University of Utah for course credit, and did not require additional participant recruitment via Prolific, as was necessary for the original study. As a consequence of sampling exclusively from a university-based undergraduate participant pool, rather than also sampling via Prolific (which recruits adults of all ages), participants in the current experiment were, on average, approximately 5 years younger than those in the original study. From a total of 87 participants, data from 20 were excluded from the final data set for the following reasons: participant was a minor (1); incomplete background questionnaire data (7); or English was not identified as a 'native' or a childhood language (12). The data from the remaining 67 individuals (mean age [range] = 22.03 [18–52] years; female = 42, male = 24, non-binary = 1) who identified English as a 'native' language and/or a language used with childhood caregivers make up the final data set reported in this manuscript. While the original study applied additional exclusionary criteria, we did not exclude participants based on self-reported medical conditions or medication use, and unlike the original study, we required only that participants identify English as a 'native' and/or childhood language, rather than both.

As in the original study, many of our participants were multilingual. Seventeen identified one or more languages (in addition to English) among their 'native' and childhood languages, including Chinese (2), Hindi (1), Hmong (1), French (1), Gujarati (1), Italian (1), Japanese (2), Kutchhi (1), Malagasy (1), Marathi (1), Portuguese (1), Spanish (5), Tamil (1), Tibetan (1), Tongan (1), Urdu (1), Vietnamese (1), and 51 participants also reported having learned additional languages: American Sign Language (ASL) (3), Chinese (3), French (12), German (5), Greek (1), Hindi (1), Italian (3), Japanese (3), Korean (5), Malagasy (1), Mandarin (2), Navajo (1), Portuguese (5), Romanian (1), Russian (2), Spanish (33), Tamil (1), Thai(1), Tongan (1), Vietnamese (1).

The 67 participants were randomly assigned to one of four counterbalanced exposure conditions crossing the variable **TeacherVoice** (the talker whose productions are attributed to the teacher; two levels: Talker1, Talker2) and the variable **TeacherAccent** (the accent produced by the teacher; two levels: z-accent, s-accent), as summarized in Table 1.

https://doi.org/10.1017/S0261444826101463 Published online by Cambridge University Press

Table 1. Summary of participants assigned to each exposure condition in Experiment 1

TeacherVoice	TeacherAccent	*N*	Mean age (range)	Gender identity: non-binary/female/male
Talker1	s-accent	16	23.94 (18–52)	0/11/5
	z-accent	18	20.39 (18–25)	1/13/4
Talker2	s-accent	16	21.81 (18–34)	0/10/6
	z-accent	17	22.18 (18–39)	0/8/9
Total		**67**	**22.03 (18–52)**	**1/42/24**

Table 2. Summary of notable differences between the original Hayes-Harb et al. (2022) study and the current study

Hayes-Harb et al. (2022) *Experimental conditions only*	Current study (Experiment 1)
Recruited from the Department of Linguistics study pool at the University of Utah and Prolific	Recruited from the Department of Linguistics study pool at the University of Utah
132 participants (33 per condition) after exclusions	67 participants (16–18 per condition) after exclusions
Exclusionary criteria: <18 years and >65 years; did not identify English as (one of) their native language(s) and a childhood language; self-reported speech, hearing, or neurological disorders; taking medications affecting motor skills	Exclusionary criteria: <18 years; did not identify English as a 'native' language and/or a language used with childhood caregivers
Mean age (range) = 27.9 (18–62) years; female = 78, male = 51, non-binary = 3	Mean age (range) = 22.03 (18–52) years; female = 42, male = 24, non-binary = 1

Table 2 provides a summary of notable differences between the participants in the original and current studies.

2.1.2. Materials

The primary methodological difference between the original study and the current one involves the auditory materials. For the current study, a new set of auditory stimuli was created to accommodate the new accent contrast. As before, the 12 (non)words were of the form consonant-vowel-consonant-vowel; however, the new stimuli have /s/ or /z/ in initial position rather than voiceless stop consonants. Three women speakers of American English (Talker1, Talker2, and Talker3) recorded four tokens each of the [s] and [z] variants of each nonword. A Praat script (Lennes, 2002) was used to extract each of the individual productions from the recordings. Each of the authors then listened to each stimulus for artifacts (e.g., hesitations, background noise) and marked one [s] and one [z] token as the best option for a given word for each talker. Final tokens were chosen based on majority endorsement and were scaled for peak intensity using a Praat script (Yoon, n.d.) The tokens produced by Talker1 and Talker2 were used during the exposure phase and were assigned to be the voice of either the teacher or the student per the exposure condition. TeacherVoice and TeacherAccent were counterbalanced such that participants in the Talker1/z-accent condition and the Talker2/s-accent condition heard identical auditory stimuli; the difference between these conditions was only which of the voices and accents was attributed to the teacher vs. the student. The same was true for participants in the Talker1/s-accent and the Talker2/z-accent conditions. The tokens produced by Talker3 were reserved for the test phase. Each word was paired with a unique line drawing image (Snodgrass & Vanderwart, 1980) depicting its meaning (see Fig. 1). All visual stimuli, including the line drawings in Fig. 1 and the iconographic images of teachers and students in Fig. 3, are identical to those used in the original study.

2.1.3. Procedure

The procedure is identical to that in the original study, employing the same informed consent, sound check, instructions, experiment tasks, and questionnaire. Both the original and the

https://doi.org/10.1017/S0261444826101463 Published online by Cambridge University Press

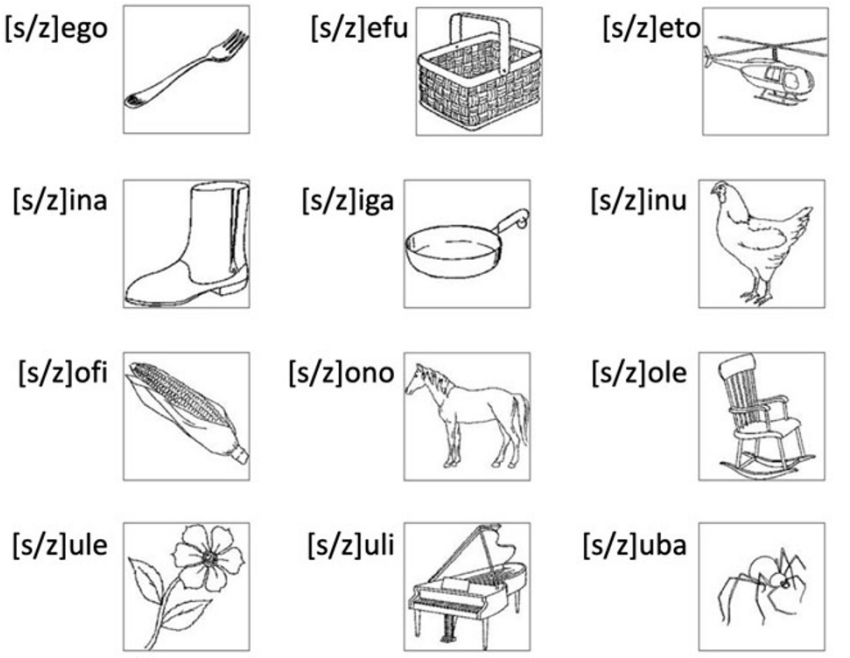


Figure 1. Twelve words in their [s] and [z] accents and associated meanings.

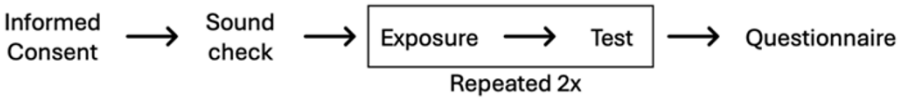


Figure 2. Experiment 1 study flow. It is identical to the study flow of the original study.

current study were conducted entirely online and lasted approximately 20 minutes. Participants were instructed to complete the entire study in a quiet location of their choosing and in a single session, and to use a computer with either a Firefox or Chrome browser and headphones.

The study flow, which is identical to the original study, is shown in Fig. 2. Participants began the study by clicking a link in the Sona experiment scheduling platform (Sona-Systems.com), which redirected them to a consent document presented via Qualtrics survey (Qualtrics.com). Upon reading the document and agreeing to participate, participants were redirected to the experimental tasks, which were created in PsychoPy (Peirce et al., 2019) and hosted on Pavlovia.org. During an initial sound check task, participants heard a male English speaker produce several high-frequency English words and were instructed to adjust their volume to a comfortable listening level. Next, participants completed the experimental tasks, which consisted of two iterations of an exposure phase and a test phase described in more detail in Sections 2.2 and 2.3. Following the experimental tasks, participants were redirected to a participant questionnaire implemented in Qualtrics, also described in Section 2.4.

https://doi.org/10.1017/S0261444826101463 Published online by Cambridge University Press

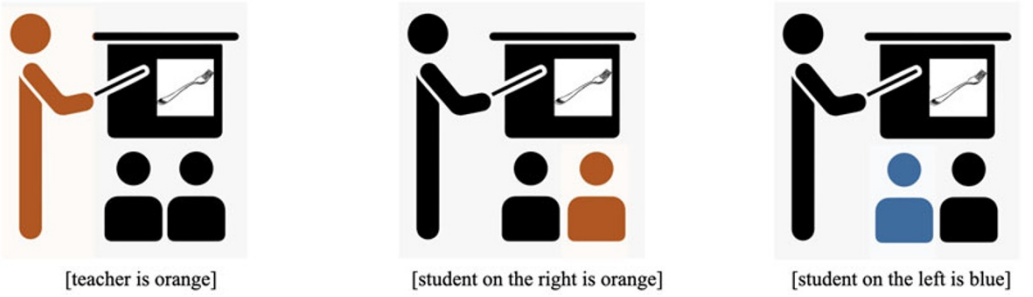


Figure 3. Images presented during exposure and test, indicating that the person saying the vocabulary word is the teacher (left image), exposure student (center image), and test student (right image). The word being said in these examples is [s/zego] 'fork.'

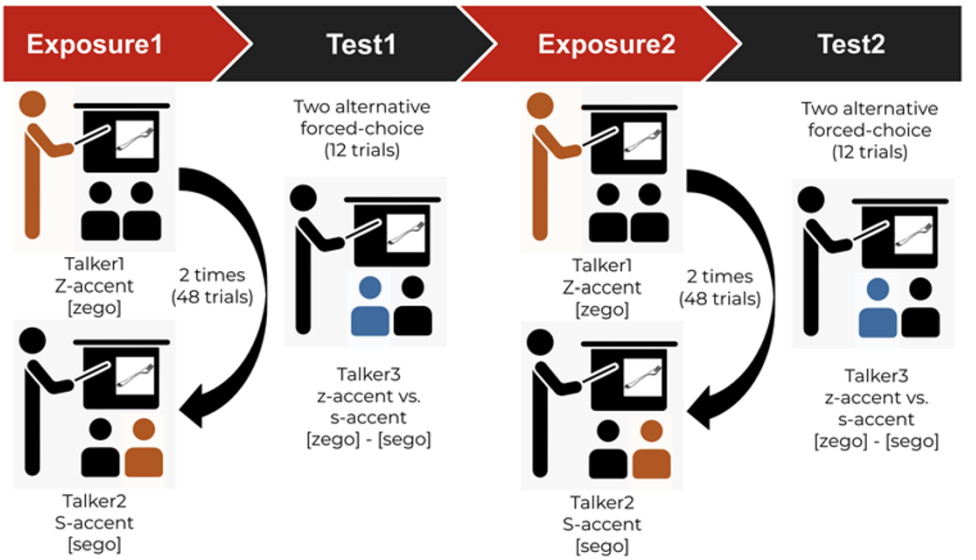


Figure 4. Schematic representation of the exposure and test phase sequence for the condition where TeacherVoice = Talker1, TeacherAccent = z-accent.

2.2. Exposure phase

Immediately prior to the first exposure phase, participants were told that they would observe a 'foreign' language class where students are learning new vocabulary, that they would hear the teacher say the new words followed by a student, and that they should pay attention to the pronunciation of the words. The individual (teacher or student) who produced each token was indicated via orange highlighting (see Fig. 3) while each auditory word was presented and the word's corresponding image/meaning appeared on the screen. Each exposure phase involved the teacher producing each of the 12 words in a random order, followed by the student doing the same. This sequence was repeated twice per exposure phase (48 exposure trials per exposure phase). There were two exposure phases for a total of 96 exposure trials (see Fig. 4).

https://doi.org/10.1017/S0261444826101463 Published online by Cambridge University Press

Table 3. Summary of notable materials and procedure differences between the original Hayes-Harb et al. (2022) study and the current study

Hayes-Harb et al. (2022)	Current study (Experiment 1)
Pronunciation contrast: word-initial short-long VOT (synthetically manipulated)	Pronunciation contrast: word-initial s and z (naturally produced)

2.3. Test phase

Each exposure phase was followed by a test phase which consisted of 12 trials (one trial for each of the 12 words presented in a random order). On each trial, participants heard both the [s] and [z] variant of the word spoken by a new talker (Talker3) who they were told was a different student than the one observed during exposure (this is the student highlighted in blue in the rightmost image in Fig. 3). Participants were instructed to choose the 'better' of the two pronunciations by pressing the '1' or the '2' keys on the keyboard to indicate the first or second production, respectively. The order of presentation of the [s] and [z] variants in the test trial associated with a particular word was counterbalanced such that for a given word, if the [s] variant was presented first in the first test phase, it was presented second in the second test phase, and vice versa. The exposure and test phase sequence was repeated twice for a total of 24 test trials (Fig. 4).

2.4. Participant questionnaire

Upon completion of the experimental tasks, participants were redirected to a Qualtrics-based questionnaire, covering their demographic and linguistic backgrounds. Several items assessing participants' social beliefs were included in the background questionnaire for the purpose of future instrument development; these items are not associated with the present research questions and are not considered in the analyses reported here.

Table 3 provides a summary of notable differences between the materials and procedure in the original and current study.

2.5. Results

The data from Experiment 1 consist of 1,608 observations (24 observations/participant). Of those, 103 (6.4%; compared to 6.7% in the original study) observations for which the response time exceeded 4 seconds were excluded from the final data set. The response coding scheme from the original study was adapted to the current accent contrast, with '1' and '2' responses converted to [z] responses (1 = [z] response and 0 = [s] response). The most substantial difference between the analyses of the original and current studies is that, as explained above, the current study lacks the four control conditions that were included in the original study. Therefore, analyses in the current study are simplified in that they do not include a fixed factor for control/experimental condition.

Figure 5 presents the mean proportion of [z] response by TeacherAccent at Test1 and Test2. TeacherAccent (the accent associated with the Teacher during exposure; either s-accent or z-accent) had a large effect on the proportion of [z] responses. Participants who heard the teacher produce the z-accent during exposure produced primarily [z] responses at test (Test1 = .86, Test2 = .93), whereas participants who observed the teacher produce the words with the s-accent produced few [z] preference responses at test (Test1 = .11, Test2 = .11).

2.5.1. Omnibus analysis

Our omnibus analysis consisted of fitting a generalized linear mixed effects model with a binomial linking function using the lme4 package (version 1.1.35.5; Bates et al., 2015) of R (version 4.4.0) and the bobyqa optimizer for speed and valid convergence. Our dependent variable was **[z] response** ([z] = 1, [s] = 0), and our contrast-coded fixed effects included **TeacherAccent**

https://doi.org/10.1017/S0261444826101463 Published online by Cambridge University Press

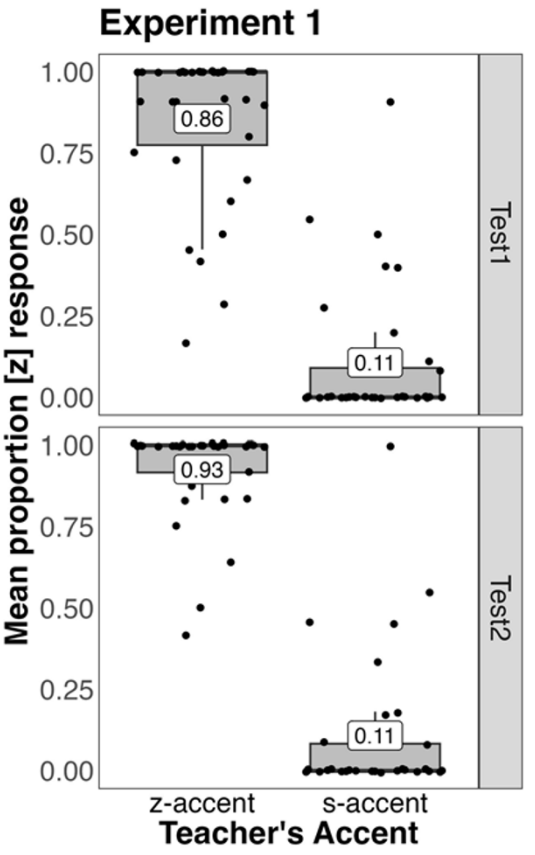


Figure 5. Boxplots of mean proportion [z] responses by TeacherAccent (z-accent, s-accent) and TestNumber (Test1, Test2) in Experiment 1. Dots indicate individual participant means, and medians are represented as horizontal lines. Superimposed proportions show the group mean proportion [z] response for the corresponding condition.

(two levels: z-accent [−.5], s-accent [.5]), **TestNumber** (two levels: Test1 [−.5], Test2 [.5]), and the counterbalancing variable **TeacherVoice** (two levels: teacher = Talker1/student = Talker2 [−.5], teacher = Talker2/student = Talker1 [.5]), and random intercepts for **Word** and **Participant** and random by-participant slopes for TestNumber (*m.three.way*; see Table 4b).

In the original study, the decision to remove the counterbalance variable TeacherVoice (which they called Teacher-Talker) from the final model was made on the basis of a lack of main effect or interactions involving this variable in the omnibus model. Here we employed a model comparison approach to this same end: We compared the three-way model described above to one without TeacherVoice (*m.two.way*; see Table 4a), using a likelihood ratio test to determine whether the more complex model including TeacherVoice provided a better fit of the data. The model including TeacherVoice did not provide a significantly better fit of the data than the simpler model ($\chi^2(4) = 5.45$, $p = .24$), and thus the inclusion of the counterbalance factor TeacherVoice was not statistically justified. This final model is summarized in Table 4. A significant main effect of TeacherAccent (*estimate* = −8.08, *SE* = .95, $z = -8.47$, $p < .001$) was observed (the analogous main effect was also significant in the original study), suggesting that accent preferences were influenced by the social role of the talker who used a particular accent during the exposure phase. As expected, participants exhibited a preference for the accent that had been used by the teacher over that of the student. Like the original study, the main effect of TestNumber was not significant; however, in contrast to the original study, we observed no significant interaction of TeacherAccent and TestNumber.

https://doi.org/10.1017/S0261444826101463 Published online by Cambridge University Press

Table 4. Generalized linear mixed effects model analysis of TeacherAccent and TestNumber (TestN) in Experiment 1

	Fixed effects				*Random effects*	
					by-participant	by-Word
Parameters	Estimate	*SE*	*z*	*p*	*SD*	*SD*
(intercept)	−.25	.38	−.65	.52	2.52	.19
TeacherAccent	−8.08	.95	−8.47	<.001		
TestN	.60	.31	1.91	.06	1.16	
TeacherAccent * TestN	−1.06	1.23	−.86	.39		

Notes: All factors were coded using contrast coding, as follows: TeacherAccent (z-accent = −.5, s-accent = .5), TestN (Test1 = −.5, Test2 = .5), TeacherVoice (Talker1 = −.5, Talker2 = .5).
(a) Two-way analysis model formula (*m.two.way*): ZResponse ~ TeacherAccent * TestN + (1 + TestN|participant) + (1 |Word), family = binomial, control = glmerControl(optimizer = 'bobyqa').
(b) Three-way analysis model formula (*m.three.way*): ZResponse ~ TeacherAccent * TestN * TeacherVoice + (1 + TestN |participant) + (1|Word), family = binomial, control = glmerControl(optimizer = 'bobyqa').

Table 5. Generalized linear mixed effects model analysis of TeacherAccent at Test1in Experiment 1

	Fixed effects				*Random effects*	
					by-participant	by-Word
Parameters	Estimate	*SE*	*z*	*p*	*SD*	*SD*
(intercept)	−.60	.54	−1.12	.27	3.18	.87
TeacherAccent	−9.08	1.61	−5.66	<.001		

Notes: All factors were coded using contrast coding, as follows: TeacherAccent (z-accent = −.5, s-accent = .5), TeacherVoice (Talker1 = −.5, Talker2 = .5).
(a) Two-way analysis model formula (*subset.m.one.way.Test1*): ZResponse ~ TeacherAccent + (1|participant) + (1|Word), family = binomial, control = glmerControl(optimizer = 'bobyqa').
(b) Three-way analysis model formula (*subset.m.two.way.Test1*): ZResponse ~ TeacherAccent * TeacherVoice + (1|participant) + (1|Word), family = binomial, control = glmerControl(optimizer = 'bobyqa').

2.5.2. Subset analyses by TestNumber

The TestNumber variable emerged as an artifact of our efforts to ensure that participants had an opportunity to gain familiarity with the test procedure (their first encounter with the test procedure was at Test1) and that they received adequate exposure to the words (via two exposure–test cycles) and is not associated with our research question. Indeed, Hayes-Harb et al. (2022) attributed observed differences between Test1 and Test2 to participants' inexperience with the test procedure and/or relatively sparser exposure earlier in the study. For this reason, and as in the original study, we performed subset analyses of the data separately by TestNumber, with the expectation that while performance at Test1 and Test2 may differ, performance at Test2 will provide a more valid measure of the effects of the manipulated variables. An effect of TeacherAccent at Test2 would replicate the original study's finding that adult language learners prefer the accent of the teacher relative to that of a student in an artificial language learning setting.

The subset analyses consisted of fixed effects of TeacherAccent and TeacherVoice, and their interactions, as well as random by-participant (participant) and by-item (Word) intercepts. We compared a model that included TeacherVoice (*subset.m.two.way.Test1* [Table 5b] and *subset.m.two.way.Test2* [Table 6b]) with one that did not (*subset.m.one.way.Test1* [Table 5a] and *subset.m.one.way.Test2* [Table 6a]). At neither Test1 nor Test2 did the model that included TeacherVoice provide a better fit to the data (Test1 subset: [$\chi^2(2) = 1.75$, $p = .42$]; Test2 subset: [$\chi^2(2) = 5.10$, $p = .08$]). These models of the Test1 and Test2 subsets are summarized in Tables 5 and 6, respectively.

https://doi.org/10.1017/S0261444826101463 Published online by Cambridge University Press

Table 6. Generalized linear mixed effects model analysis of TeacherAccent at Test2 in Experiment 1

	Fixed effects				*Random effects*	
					by-participant	by-Word
Parameters	Estimate	*SE*	*z*	*p*	*SD*	*SD*
(intercept)	.23	.47	.49	.62	3.13	.22
TeacherAccent	−9.77	1.94	−5.03	<.001		

Notes: All factors were coded using contrast coding, as follows: TeacherAccent (z-accent = −.5, s-accent = .5), TeacherVoice (Talker1 = −.5, Talker2 = .5).
(a) Two-way analysis model formula (*subset.m.one.way.Test2*): ZResponse ~ TeacherAccent + (1|participant) + (1|Word), family = binomial, control = glmerControl(optimizer = 'bobyqa').
(b) Three-way analysis model formula (*subset.m.two.way.Test2*): ZResponse ~ TeacherAccent * TeacherVoice + (1|participant) + (1|Word), family = binomial, control = glmerControl(optimizer = 'bobyqa').

In contrast with the original study, where a significant effect of the teacher's accent emerged only at Test2, we observe an effect of TeacherAccent for both Test1 (*estimate* = −9.08, *SE* = 1.61, $z = -5.66$, $p < .001$) and Test2 (*estimate* = −9.77, *SE* = 1.94, $z = -5.03$, $p < .001$) subsets, with participants exhibiting a strong preference for the accent that had been associated with the teacher (as opposed to the student) during the exposure phase.

2.6. Discussion

Experiment 1 was a close replication of the experimental conditions reported in Hayes-Harb et al. (2022), addressing the question of whether participants will prefer the accent of a teacher relative to that of a student peer in an artificial language learning setting. We varied the accent that learners heard associated with 12 words such that between the teacher and the student the learners heard equal numbers of [s] and [z] variants and such that the accent and the voice attributed to the teacher and student were counterbalanced across participants. We found that participants exhibited a preference for the pronunciation that was associated with the teacher during exposure. We thus replicate the teacher preference effect reported in Hayes-Harb et al. (2022) with the new /s/–/z/ contrast. Indeed, with this new contrast, the effect is both larger and appears sooner (at Test1) than in the original study. It is worth noting that in addition to the intentional alteration in pronunciation contrast, incidental participant differences between the original and current studies in (1) how participants were sampled (via a university participant pool vs. a combination of the participant pool and Prolific); (2) the current lack of a medical condition/medication exclusionary criterion (it is no longer the practice of our lab to exclude participants using a medical criterion); and even (3) a loosening of the language background criterion to require only that participants identify English as a 'native' or childhood language (we currently employ a more expansive definition of L1 English speaker) did not alter the pattern of results. Thus, the finding is robust to these differences, and having observed this strong preference for the teacher's accent with these new materials, in Experiment 2, we set out to address the question of whether language learners' preferences for the teacher's pronunciation relative to that of a student are influenced by 'favorable' and 'unfavorable' vignettes regarding the teacher's characteristics.

3. Experiment 2

Study materials, experiment scripts, anonymized data, and analysis scripts are available at: https://osf.io/8nu2p/.

https://doi.org/10.1017/S0261444826101463 Published online by Cambridge University Press

Table 7. Summary of participants assigned to each exposure condition in Experiment 2

VignetteCondition	TeacherVoice	TeacherAccent	*N*	Mean age (range)	Gender identity: non-binary/female/male/prefer not to answer
'favorable'	Talker1	s	19	24 (18–64)	1/11/7/0
		z	18	20.29 (18–24)	0/14/3/0
	Talker2	s	21	21.86 (18–52)	0/14/7/0
		z	19	20.16 (18–23)	1/12/6/0
'unfavorable'	Talker1	s	19	21.89 (18–36)	0/13/6/0
		z	19	20.32 (18–24)	0/13/6/0
	Talker2	s	16	21.12 (18–33)	0/9/7/0
		z	16	22.88 (18–47)	0/10/4/2
Total			**146**	**21.57 (18–64)**	**2/96/46/2**

3.1. Methods

3.1.1. Participants

We recruited 220 individuals from the Linguistics Department study pool at the University of Utah, all of whom received course credit for their participation. Data from 74 participants were excluded from the final data set for one or more of the following reasons: not identifying English among the languages they considered 'native' or a language they used with childhood caregivers (19), familiarity with one of the talker's voices (46), and for having completed a prior version of this study (23). Data from the remaining 146 participants were included in the analyzed data set. Forty-eight of these individuals additionally identified one or more of the following languages as their 'native' language(s) and/or languages used with childhood caregivers: Arabic (1), ASL (2), Bosnian (1), Croatian (1), Cantonese (1), German (3), Gujarati (2), Hindi (2), Marathi (1), Japanese (1), Korean (1), Kutchi (1), Mandarin (1), Navajo (2), Nepali (1), Punjabi (1), Russian (1), Samoan (1), Sindhi (1), Spanish (25), Tagalog (1), Taishanese (1), Tamil (1), Turkish (1), Urdu (3). Ninety-one of these individuals also reported having learned additional languages, including Albanian (1), Arabic (5), ASL (7), Chinese (2), Croatian (1), French (22), German (11), Hindi (1), Italian (5), Japanese (8), Korean (6), Latin (1), Mandarin (2), Navajo (1), Norwegian (2), Russian (7), Sanskrit (1), Spanish (47), Swahili (1), Tagalog (1), Turkish (2). Participants were distributed across the eight counterbalanced exposure conditions crossing TeacherVoice (Talker1, Talker2), TeacherAccent (z-accent, s-accent), and VignetteCondition ('favorable,' 'unfavorable'), as summarized in Table 7.

3.1.2. Materials

The auditory and visual stimuli used in the exposure and test phase were identical to those used in Experiment 1. The only difference between the procedures in Experiment 1 and Experiment 2 was that prior to exposure, participants read a vignette (see Table 8) describing the teacher with social characteristics that were expected to enhance ('favorable') or diminish ('unfavorable') the preference for the teacher's pronunciation observed in Experiment 1.

3.1.3. Procedure

The procedure was identical to Experiment 1 except that immediately prior to each exposure phase, participants read the vignette corresponding with their randomly assigned condition. In addition, we included four new items in the questionnaire probing participants' beliefs about language and accents. Responses to these items are not included in the planned analyses as they are not associated with our research questions. However, we present a preliminary exploratory analysis of participants'

https://doi.org/10.1017/S0261444826101463 Published online by Cambridge University Press

Table 8. Two vignettes describing the teacher's language background, teacher training, and teaching effectiveness in Experiment 2

'favorable'	*The teacher is a native speaker of the language they are teaching. They have a master's degree in language teaching and have won several awards for their effectiveness in teaching pronunciation.*
'unfavorable'	*The teacher learned the language they are teaching in college. They are new to teaching and they have struggled to develop their skills in teaching pronunciation.*

responses to these items in an exploratory analysis of individual participant differences and further take up these analyses in Section 4.

3.2. Results

Experiment 2 data consist of 3,504 observations (24 observations/participant). Of those, 192 (5.5%) observations for which the response time exceeded 4 seconds were excluded. The final data set includes 3,312 observations. '1' and '2' responses were converted to [z] responses (1 = [z] response and 0 = [s] response). Figure 6 presents the mean proportion of [z] response by TeacherAccent at Test1 and Test2 for the 'favorable' vs. 'unfavorable' VignetteCondition. In the 'favorable' VignetteCondition, TeacherAccent had a large effect on the proportion of [z] responses. As in Experiment 1, participants who heard the teacher produce the z-accent during the exposure phase produced primarily [z] responses at test (Test1 = .82, Test2 = .92), whereas participants who observed the teacher produce the words with the s-accent produced few [z] preference responses (more [s] responses) at test (Test1 = .17, Test2 = .10). By contrast, participants in the 'unfavorable' VignetteCondition exhibited a reduced preference for the teacher's accent when the teacher was characterized unfavorably (z-accent-Test1 = .68, z-accent-Test2 = .59, s-accent-Test1 = .48, s-accent-Test2 = .51).

3.2.1. Omnibus analysis

We again fit a generalized linear mixed effects model with a binomial linking function using the lme4 package (version 1.1.35.5; Bates et al., 2015) of R (version 4.4.0) and the bobyqa optimizer. Our dependent variable was **[z] response** ([z] = 1, [s] = 0) and our contrast-coded fixed effects included **VignetteCondition** (two levels: 'favorable' [−.5], 'unfavorable' [.5]), **TeacherAccent** (two levels: z-accent [−.5], s-accent [.5]), **TestNumber** (two levels: Test1 [−.5], Test2 [.5]), and the counterbalancing variable **TeacherVoice** (two levels: teacher = Talker1/student = Talker2 [−.5], teacher = Talker2/student = Talker1 [.5]), and random intercepts for **Word** and **Participant** and random by-participant slopes for TestNumber. Planned comparisons were conducted using simultaneous tests for general linear hypotheses with the multcomp package (version 1.4.25; Hothorn et al., 2008). *P*-values were adjusted using the single-step method and a family-wise error rate protection via Bonferroni correction.

As was done for Experiment 1, we first compared two models, one that included TeacherVoice (*m.four.way*; see Table 9b) as main effect as well as all possible interaction terms with the other fixed effects in the model and one without TeacherVoice (*m.three.way*; see Table 9a), using a likelihood ratio test to determine whether the more complex model including TeacherVoice provided a better fit of the data. The model including TeacherVoice was not statistically justified ($\chi^2(8) = 7.68, p = .47$).

The final model is summarized in Table 9. We observed a significant main effect of TeacherAccent (*estimate* = −5.20, *SE* = .64, *z* = −8.14, $p < .001$), as well as significant interactions of VignetteCondition * TeacherAccent (*estimate* = 7.49, *SE* = 1.22, *z* = 6.13, $p < .001$), TeacherAccent * TestNumber (*estimate* = −2.43, *SE* = .86, *z* = −2.83, $p < .01$), and VignetteCondition * TeacherAccent * TestNumber (*estimate* = 6.40, *SE* = 1.55, *z* = 4.13, $p < .001$).

https://doi.org/10.1017/S0261444826101463 Published online by Cambridge University Press

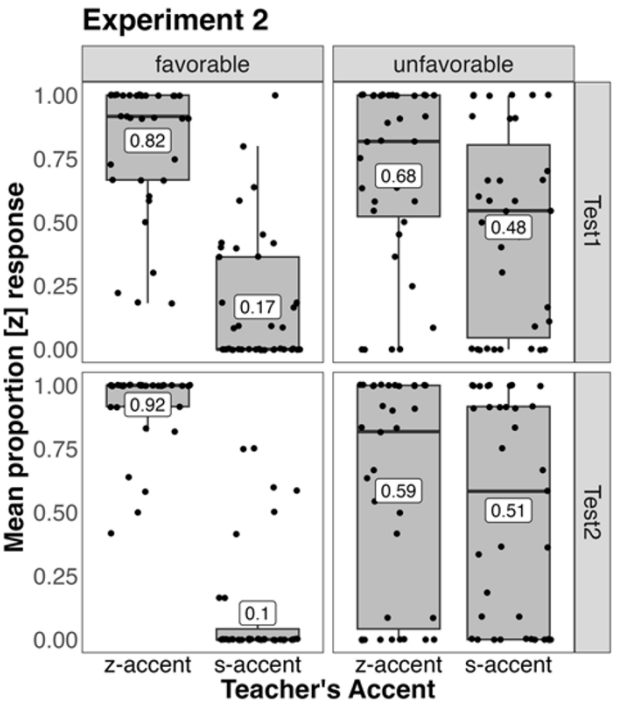


Figure 6. Boxplots of mean proportion [z] responses by Vignette (favorable, unfavorable), TeacherAccent (z-accent, s-accent), and TestNumber (Test1, Test2) in Experiment 2. Dots indicate individual participant means, and medians are represented as horizontal lines. Superimposed proportions show the group mean proportion [z] response for the corresponding condition.

Table 9. Generalized linear mixed effects model analysis of VignetteCondition, TeacherAccent, and TestNumber (TestN) in Experiment 2

	Fixed effects				*Random effects*	
					by-participant	by-Word
Parameters	Estimate	*SE*	*z*	*p*	*SD*	*SD*
(intercept)	.13	.29	.46	.65	3.13	.07
VignetteCondition	.62	.58	1.06	.29		
TeacherAccent	−5.20	.64	−8.14	<.001		
TestN	−.19	.34	−.57	.57	3.05	
VignetteCondition * TeacherAccent	7.49	1.22	6.13	<.001		
VignetteCondition * TestN	−.36	.68	−.53	.59		
TeacherAccent * TestN	−2.43	.86	−2.83	<.01		
VignetteCondition * TeacherAccent * TestN	6.40	1.55	4.13	<.001		

Notes: All factors were contrast coded, as follows: VignetteCondition ('favorable' = −.5, 'unfavorable' = .5), TeacherAccent (z-accent = −.5, s-accent = .5), TeacherVoice (Talker1 = −.5, Talker2 = .5), TestN (Test1 = −.5, Test2 = .5).
(a) Three-way analysis model formula (*m.three.way*): ZResponse ~ VignetteCondition * TeacherAccent * TestN + (1 + TestN|participant) + (1|Word), family = binomial, control = glmerControl(optimizer = 'bobyqa').
(b) Four-way analysis model formula (*m.four.way*): ZResponse ~ VignetteCondition * TeacherAccent * TestN * TeacherVoice + (1 + TestN|participant) + (1|Word), family = binomial, control = glmerControl(optimizer = 'bobyqa').

https://doi.org/10.1017/S0261444826101463 Published online by Cambridge University Press

Table 10. Generalized linear mixed effects model analysis of VignetteCondition, TeacherAccent for Test1 subset in Experiment 2

	Fixed effects				*Random effects*	
					by-participant	by-Word
Parameters	Estimate	*SE*	*z*	*p*	*SD*	*SD*
(intercept)	.30	.27	1.11	.27	2.80	.17
VignetteCondition	.79	.54	1.47	.14		
TeacherAccent	−4.13	.60	−6.94	<.001		
VignetteCondition * TeacherAccent	4.36	1.11	3.94	<.001		

Notes: All factors were contrast coded, as follows: VignetteCondition ('favorable' = −.5, 'unfavorable' = .5), TeacherAccent (z-accent = −.5, s-accent = .5), TeacherVoice (Talker1 = −.5, Talker2 = .5).
(a) Two-way analysis model formula (*subset.m.two.way.Test1*): ZResponse ~ VignetteCondition * TeacherAccent + (1|participant) + (1|Word), family = binomial, control = glmerControl(optimizer = 'bobyqa').
(b) Three-way analysis model formula (*subset.m.three.way.Test1*): ZResponse ~ VignetteCondition * TeacherAccent * TeacherVoice + (1|participant) + (1|Word), family = binomial, control = glmerControl(optimizer = 'bobyqa').

Table 11. Generalized linear mixed effects model analysis of VignetteCondition, TeacherAccent for Test2 subset in Experiment 2

	Fixed effects				*Random effects*	
					by-participant	by-Word
Parameters	Estimate	*SE*	*z*	*p*	*SD*	*SD*
(intercept)	.14	.41	.34	.74	4.53	.10
VignetteCondition	.49	.82	.60	.55		
TeacherAccent	−7.05	1.02	−6.92	<.001		
VignetteCondition * TeacherAccent	11.66	1.86	6.26	<.001		

Notes: All factors were contrast coded, as follows: VignetteCondition ('favorable' = −.5, 'unfavorable' = .5), TeacherAccent (z-accent = −.5, s-accent = .5), TeacherVoice (Talker1 = −.5, Talker2 = .5).
(a) Two-way analysis model formula (*subset.m.two.way.Test2*): ZResponse ~ VignetteCondition * TeacherAccent + (1|participant) + (1|Word), family = binomial, control = glmerControl(optimizer = 'bobyqa').
(b) Three-way analysis model formula (*subset.m.three.way.Test2*): ZResponse ~ VignetteCondition * TeacherAccent * TeacherVoice + (1|participant) + (1|Word), family = binomial, control = glmerControl(optimizer = 'bobyqa').

3.2.2. Subset analyses by TestNumber

Our subset analyses consisted of fixed effects of VignetteCondition, TeacherAccent, and TeacherVoice, and their interactions, as well as random by-participant (Part_ID) and by-item (Word) intercepts. A two-way interaction of VignetteCondition and TeacherAccent at Test2 would support our hypothesis that adult language learners' preferences for the accent of the teacher (relative to that of a student) are influenced by the social characteristics of the teacher (teaching experience, teaching effectiveness, and linguistic background) presented via vignettes. As was done for the omnibus analysis, we compared a model that included TeacherVoice (see Tables 10b and 11b) with one that did not include this variable (see Tables 10a and 11a). In neither of the subset analyses of data did the model that included TeacherVoice provide a better fit to the data (Test1 subset: $[\chi^2(4) = 4.38, p = .36]$; Test2 subset: $[\chi^2(4) = 5.18, p = .27]$). These models of the Test1 and Test2 subsets are summarized in Tables 10 and 11, respectively.

For the Test1 subset, we observe a significant main effect of TeacherAccent (*estimate* = −4.13, $SE = .60$, $z = -6.94$, $p = < .001$), as well as a significant two-way interaction of VignetteCondition and TeacherAccent (*estimate* = 4.36, $SE = 1.11$, $z = 3.94$, $p = <.001$). Pairwise comparisons of

https://doi.org/10.1017/S0261444826101463 Published online by Cambridge University Press

TeacherAccent were significant at Test1 for both the 'favorable' (*estimate* = −6.31, *SE* = .86, *z* = −7.33, $p < .001$) and the 'unfavorable' vignette conditions (*estimate* = −1.95, *SE* = .76, *z* = −2.57, *p* = .02).

For the Test2 subset, we observe a significant main effect of TeacherAccent (*estimate* = −7.05, *SE* = 1.02, *z* = −6.92, $p < .001$), as well as a significant two-way interaction of VignetteCondition and TeacherAccent (*estimate* = 11.66, *SE* = 1.86, *z* = 6.26, $p < .001$), suggesting that participants' accent preferences were influenced by who produced the particular accent (teacher or student) but also that this preference was modulated by the social characteristics attributed to the teacher via the vignette. Pairwise comparisons of TeacherAccent were significant at Test2 for the 'favorable' (*estimate* = −12.88, *SE* = 1.49, *z* = −8.64, $p < .001$), but not for the 'unfavorable' vignette conditions (*estimate* = −1.21, *SE* = 1.26, *z* = −0.96, *p* = .56).

3.2.3. Exploratory analysis of individual participant differences

The research questions addressed in this study concern group-level responses to input sources in accent learning. However, study participants are likely to vary in their responses to the social characteristics of talkers based on their experiences and attitudes (Babel & Russell, 2015; Ingvalson et al., 2017; Kutlu et al., 2022; Ryken et al., 2024), and individual listener factors have also been shown to affect perceptual learning (Amitay et al., 2010). In order to explore whether individuals varied in the preference for the teacher's accent regardless of the particular accent that had been associated with the teacher, we computed the mean proportion of the time that participants exhibited a TeacherPreference response on a by-participant basis from their mean proportion [z] response. For participants in the z-accent condition, their mean proportion [z]-response is the same as their mean proportion TeacherPreference response. For participants in the s-accent condition, TeacherPreference was the inverse of their mean proportion [z]-response. Figure 7 shows histograms of participants' mean proportion of TeacherPreference responses by VignetteCondition and TestNumber. This exploratory descriptive analysis of the results of Experiment 2 reveals a bimodal distribution of participants' mean Teacher Preference responses in the unfavorable vignette condition.

The group means reported in Fig. 6 might be interpreted as indicating that these participants as a group experienced a modulation of their accent preferences as a result of the 'unfavorable' vignette; however, the histograms presented in Fig. 7 instead indicate that most of the participants exhibited *either* a strong preference for the teacher's accent *or* a strong preference for the student's accent.

As noted above, Experiment 2 participants responded to four language belief items in the participant background questionnaire. These items required participants to select a response along a slider from 0 (not at all agree) to 100 (completely agree) to each of the following statements: (1) It is important for a language teacher to be a native speaker of the language; (2) The goal of a language learner should be to pronounce the language like a native speaker; (3) Correct pronunciation is an important goal for language learners; and (4) Non-native accents make it hard for me to understand speech.

While the slider items are preliminary and the instrument is still under development, responses to these might shed light on the individual differences observed in Experiment 2 performance. We conducted further exploratory analysis to determine whether responses to these items would help to explain participants' accent preferences. We compared the three-way omnibus model (*m.three.way*; see Table 10a) with four additional models, each of which incorporated one of the four accent sliders as an additional predictor variable (*teacher_ns, ns_goal, correct_goal*, and *accent_hard*). Because we cannot assume that individual participants use this scale in the same way across items, or that these scales are used the same way by different individuals, we standardized and centered the variables prior to including them as predictors in or model using the scale (…, center = TRUE, scale = TRUE) function in R. Model comparisons confirmed that none of these models improved model fit relative to the simpler three-way model (*teacher_ns* = [$\chi^2(1) = .75, p = .39$], *ns_goal* = [$\chi^2(1) = .01, p = .91$], *correct_goal* = [$\chi^2(1) = .92, p = .34$], or *accent_hard* = [$\chi^2(1) = .16, p = .69$]). Thus, this preliminary

https://doi.org/10.1017/S0261444826101463 Published online by Cambridge University Press

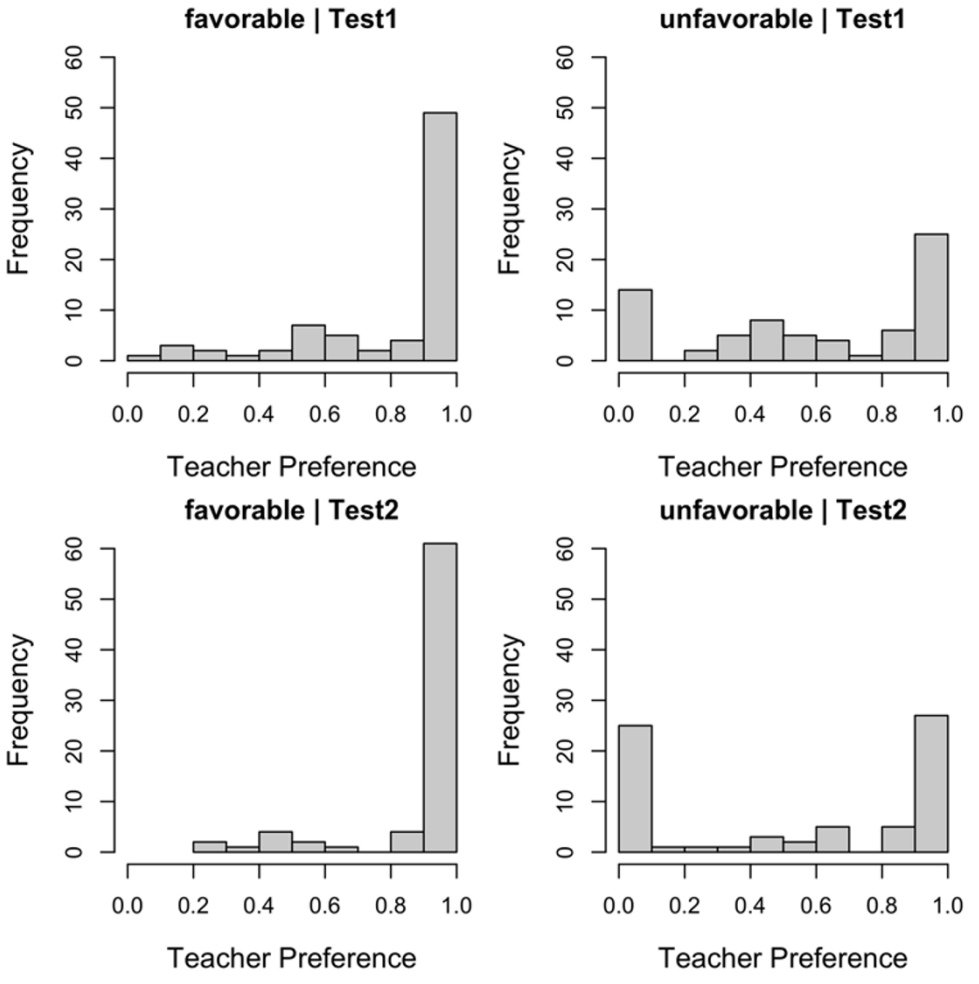


Figure 7. Histograms of the distribution of participants' mean proportion TeacherPreference responses by VignetteCondition and TestNumber in Experiment 2.

and exploratory analysis of these four language beliefs items did not enhance our understanding of the individual differences we observed. The need for additional work on individual variation is taken up in Section 4.

3.3. Discussion

In Experiment 2, we asked whether participants' preferences for the teacher's pronunciation relative to that of a student are influenced by 'favorable' and 'unfavorable' vignettes provided regarding the teacher's social characteristics. We again found that despite identical auditory input during the exposure phase, participants preferred the teacher's pronunciation, replicating the findings of Hayes-Harb et al. (2022) and Experiment 1. However, the preference for the teacher's accent was modulated by the social characteristics ascribed to the teacher via vignettes concerning the teacher's teaching experience, teaching effectiveness, and linguistic background. At both Test1 and Test2, we observed a two-way interaction of TeacherAccent and Vignette Condition. While we observed a strong preference for the TeacherAccent in the 'favorable' condition at both Test1 and Test2, we

https://doi.org/10.1017/S0261444826101463 Published online by Cambridge University Press

observed an effect of TeacherAccent at Test1, but not Test2, in the 'unfavorable' condition; by Test2, participants show no preference for the teacher's accent relative to that of the student when the teacher is described 'unfavorably.' Exploratory analyses revealed that participants, especially those in the 'unfavorable' conditions, exhibited a great deal of individual variation; however, statistical analyses incorporating responses to four preliminary language and accent belief items failed to explain the individual differences.

4. General discussion

This study had two main goals: First, to replicate Hayes-Harb et al. (2022) with a new pronunciation contrast (Experiment 1), and second, to further build on those findings by investigating whether adult language learners' preferences for the accent exemplified by a language teacher are affected by a (favorable vs. unfavorable) characterization of the teacher's language background, teaching experience, and teaching effectiveness. Experiment 1 robustly replicated the Hayes-Harb et al. (2022) finding with the new /s/–/z/ accent contrast, with participants showing a strong preference for the accent that was associated with the teacher in their counterbalanced exposure condition. This new contrast produced the same preference for the teacher's accent, but with a larger effect size. As noted above, this was the case despite incidental differences in how participants were sampled and our more inclusive criteria for participant inclusion. Moreover, Experiment 2 revealed that this teacher preference is modulated by the presentation of vignettes providing 'favorable' vs. 'unfavorable' descriptions of the teacher's language background, teaching experience, and teaching effectiveness, with participants showing a strong preference for the teacher's accent in the 'favorable' vignette condition and no preference for the teacher's accent in the 'unfavorable' vignette condition at Test2.

The results presented here highlight the influence of a teacher's ascribed social characteristics on language learners' accent preferences, further complicating our understanding of how speech input influences speech learning in a new language. It appears that learners take into account not only the formal role of the speaker (teacher vs. student) but further weigh the value of input from the teacher based on their beliefs about the quality of the teacher's speech as influenced by information about the teacher's language background and teaching experience and effectiveness. Thus, language learners engage in sophisticated assessments of the (perceived) value of different input sources and take this information into account when developing accent preferences.

In contrast to studies that attempt to isolate speech learning from its social context, the findings reported here highlight the importance of considering the influence of social factors on language learning. Importantly, despite identical auditory input across conditions, participants exhibited differential patterns of accent preference based on the social characteristics ascribed to their input sources. Therefore, any account of phonetic and phonological acquisition must accommodate the influence of learners' awareness of and response to social factors in pronunciation teaching and learning (Atkinson, 2014; Atkinson et al., 2007; Foote & Trofimovich, 2017; Trofimovich, 2016).

Our approach in the present work was to explore whether a preference for the teacher's accent is modulated by attributing social characteristics to the teacher persona. The vignettes presented in this study described the teachers 'favorably' and 'unfavorably' on multiple social dimensions simultaneously. In order to understand the contributions of each of these individual dimensions to learners' accent preferences, future work must manipulate teacher language background, teaching experience, and teaching effectiveness independently. For example, vignettes focused only on the language background of the teacher ('The teacher is a native/nonnative speaker of the language they are teaching') could produce results that clarify the contribution of 'native speakerhood' ideology to participants' accent preferences. Similar studies isolating and manipulating ascribed characterizations of teaching experience or teaching effectiveness would shed additional

https://doi.org/10.1017/S0261444826101463 Published online by Cambridge University Press

light on how language learners' beliefs about language learning and language teaching shape pronunciation learning in the classroom. In addition, here we have chosen to focus on only a small number of social characteristics that could influence accent preference in the present study. Future research should examine which individual and social variables influence the relative value assigned to various sources of language input in the language teaching context and beyond.

Another feature of this study worth scrutinizing is the use of human-shaped iconographic images to represent the teacher and students. These images were selected with the intention of limiting the complicating influence of social information that individuals extract from talkers' visual presentations. It is well-established that the auditory and visual presentations of talkers are inextricably linked such that listeners extract rich information about the (presumed) social identities of talkers from the speech signal alone (Lippi-Green, 1997), and adult language learners recruit race-based linguistic expectations to inform their interpretation of phonological variation (Ryken et al., 2024). Similarly, responses to speech are modulated by the perceived racial identity of the speaker gleaned from the speaker's visual presentation (Babel & Russell, 2015; Kang & Rubin, 2009; Kutlu, 2020; McGowan, 2015; Rubin, 1992). In this way, in future investigations, we might expect the preference for a teacher's speech to be influenced by their beliefs about the relationship between a teacher's (perceived) race and their (perceived) legitimacy as a source of a socially desirable accent.

Finally, the judgments participants make regarding pronunciation quality in a two-alternative forced-choice accent preference task like the one used here may rely on representations which are distinct from those that a learner eventually acquires and uses over the course of learning a new language. While highly controlled experiments such as the ones reported here provide one perspective on the impact of social bias on the adult learning of the pronunciation in a new language, an enhanced understanding of the social and perceptual mechanisms that underlie accent learning will require that we move beyond the two-alternative forced-choice accent preference task and beyond the simulated language classroom.

5. Conclusion

The two experiments reported here provide new empirical evidence that individuals are sensitive to social characteristics of talkers when developing pronunciation preferences in a new language. Specifically, participants exhibited a preference for the pronunciation patterns of a talker they believed to be a language teacher over those of a talker they believed to be a language learner. In addition, participants were sensitive to elaborations on the teacher's language background, teaching experience, and teaching efficacy, such that the preference for the teacher over the student was greater when the teacher was ascribed 'favorable' vs. 'unfavorable' characteristics. These findings support the argument that the social and linguistic aspects of language learning are inseparable (Block, 2003; Young, 1999) by demonstrating that language learners' internalized social biases influence their pronunciation preferences. Shedding light on these social biases and their impacts on learners can help to address the many overt – and covert – ways in which linguistic discrimination is perpetuated in language teaching and learning contexts. Future research should continue to address gaps in our understanding of how learners navigate speech variability and how language learning is impacted by linguistic bias.

Acknowledgements. We are grateful for the contributions of our colleagues Alayo Tripp, Joanne Moffatt and the members of the Speech Acquisition Lab at the University of Utah, in addition to the valuable feedback provided by Graeme Porte and an anonymous reviewer, the Cognitive Language Research Aficionados Research Group (CLARG) at the University of Utah, the L2 Speech Learning Research Group at the University of Western Ontario, as well as by audiences at a TESOL Special Interest

https://doi.org/10.1017/S0261444826101463 Published online by Cambridge University Press

Speech, Pronunciation, and Listening (SPLIS) webinar (2022) and Pronunciation in Second Language Learning and Teaching (PSLLT) conference (2023).

Funding statement. The research reported in the article was made possible in part by a grant from the Spencer Foundation (#S202500152). The views expressed are those of the authors and do not necessarily reflect the views of the Spencer Foundation.

Notes

1. VOT duration is measured as the time between the release of a stop closure and the onset of voicing. It is an acoustic parameter that varies continuously. In American English, this acoustic cue is used to signal the distinction between voiced and voiceless stops (e.g., the /t/ in 'to' is produced with a long VOT, whereas the /d/ in 'do' is produced with a short VOT).
2. The author positionality statement is available at https://osf.io/8nu2p/.

References

Amitay, S., Halliday, L., Taylor, J., Sohoglu, E., & Moore, D. R. (2010). Motivation and intelligence drive auditory perceptual learning. *PLOS ONE*, *5*(3), e9816. https://doi.org/10.1371/journal.pone.0009816

Atkinson, D. (2014). Language learning in mindbodyworld: A sociocognitive approach to second language acquisition. *Language Teaching*, *47*(4), 467–483. https://doi.org/10.1017/S0261444813000153

Atkinson, D., Churchill, E., Nishino, T., & Okada, H. (2007). Alignment and interaction in a sociocognitive approach to second language acquisition. *Modern Language Journal*, *91*(2), 169–188. https://doi.org/10.1111/j.1540-4781.2007.00539.x

Babel, M., & Russell, J. (2015). Expectations and speech intelligibility. *The Journal of the Acoustical Society of America*, *137*(5), 2823–2833. https://doi.org/10.1121/1.4919317

Ballard, L., & Winke, P. (2017). Students' attitudes towards English teachers' accents: The interplay of accent familiarity, comprehensibility, intelligibility, perceived native speaker status, and acceptability as a teacher. In T. Isaacs & P. Trofimovich (Eds.), *Second language pronunciation assessment: Interdisciplinary perspectives* (pp. 121–140). Multilingual Matters. https://doi.org/10.21832/9781783096855-009

Bates, D., Mächler, M., Bolker, B., & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software*, *67* (1), 1–48. https://doi.org/10.18637/jss.v067.i01

Block, D. (2003). *The social turn in second language acquisition*. Edinburgh University Press. https://doi.org/10.3366/j.ctvxcrwd8

Cantone, J. A., Martinez, L. N., Willis-esqueda, C., & Miller, T. (2019). Sounding guilty: How accent bias affects juror judgments of culpability. *Journal of Ethnicity in Criminal Justice*, *17*(3), 228–253. https://doi.org/10.1080/15377938.2019.1623963

Deprez-Sims, A.-S., & Morris, S. B. (2010). Accents in the workplace: Their effects during a job interview. *International Journal of Psychology*, *45*(6), 417–426. https://doi.org/10.1080/00207594.2010.499950

Falkert, A. (2016). The relevance of accent in L2 pronunciation instruction: A matter of teaching cultures or language ideologies? *International Journal of Pedagogies and Learning*, *11*(3), 259–270. https://doi.org/10.1080/22040552.2016.1272533

Foote, J. A., & Trofimovich, P. (2017). Second language pronunciation learning: An overview of theoretical perspectives. In O. Kang, R. I. Thomson & J. M. Murphy (Eds.), *The Routledge handbook of contemporary English pronunciation* (pp. 75–90). Routledge. https://doi.org/10.4324/9781315145006–6

Frumkin, L. (2007). Influences of accent and ethnic background on perceptions of eyewitness testimony. *Psychology, Crime & Law*, *13*(3), 317–331. https://doi.org/10.1080/10683160600822246

Gurkan, S., & Yuksel, D. (2012). Evaluating the contributions of native and non-native teachers to an English language teaching program. *Procedia - Social and Behavioral Sciences*, *46*, 2951–2958. https://doi.org/10.1016/j.sbspro.2012.05.596

Hayes-Harb, R., Barrios, S. L., & Tripp, A. (2022). Whose input matters?: The influence of socially-differentiated input sources in adult Lx phonetic learning. *Journal of Second Language Pronunciation*, *8*(3), 363–388. https://doi.org/10.1075/jslp.21050.hay

Hismanoglu, M. (2019). A study on the qualities of effective EFL teachers from the perspectives of preparatory program Turkish EFL students. *International Journal of Curriculum and Instruction*, *11*(1), 101–124. https://ijci.net/index.php/IJCI/article/view/223

Hothorn, T., Bretz, F., & Westfall, P. (2008). Simultaneous inference in general parametric models. *Biometrical Journal*, *50*(3), 346–363. https://doi.org/10.1002/bimj.200810425

Ingvalson, E. M., Lansford, K. L., Federova, V., & Fernandez, G. (2017). Listeners' attitudes toward accented talkers uniquely predicts accented speech perception. *The Journal of the Acoustical Society of America*, *141*(3), EL234. https://doi.org/10.1121/1.4977583

Kang, O., & Rubin, D. L. (2009). Reverse linguistic stereotyping: Measuring the effect of listener expectations on speech evaluation. *Journal of Language and Social Psychology*, *28*(4), 441–456. https://doi.org/10.1177/0261927X09341950

https://doi.org/10.1017/S0261444826101463 Published online by Cambridge University Press

Kutlu, E. (2020). Now you see me, now you mishear me: Raciolinguistic accounts of speech perception in different English varieties. *Journal of Multilingual and Multicultural Development*, *44*(6), 511–525. https://doi.org/10.1080/01434632.2020.1835929

Kutlu, E., Tiv, M., Wulff, S., & Titone, D. (2022). Does race impact speech perception? An account of accented speech in two different multilingual locales. *Cognitive Research: Principles and Implications*, *7*(1), 7. https://doi.org/10.1186/s41235-022-00354-0

Lasagabaster, D., & Sierra, J. M. (2002). University students' perceptions of native and non-native speaker teachers of English. *Language Awareness*, *11*(2), 132–142. https://doi.org/10.1080/09658410208667051

Lennes, M. (2002). *Save labeled intervals to wav sound files* [Praat script].

Levis, J., Sonsaat, S., & Link, S. (2017). Students' beliefs about native vs. non-native pronunciation teachers. In J.D.M. Agudo (Ed.), *Native and non-native teachers in English language classrooms* (pp. 205–238). De Gruyter Mouton. https://doi.org/10.1515/9781501504143-011

Ling, C. Y., & Braine, G. (2007). The attitudes of university students towards non-native English-speaking teachers in Hong Kong. *RELC Journal*, *38*(3), 257–277. https://doi.org/10.1177/0033688207085847

Lippi-Green, R. (1997). *English with an accent: Language, ideology, and discrimination in the United States*. Psychology Press.

McGowan, K. B. (2015). Social expectation improves speech perception in noise. *Language and Speech*, *58*(4), 502–521. https://doi.org/10.1177/0023830914565191

Nelson, L. R., Signorella, M. L., & Botti, K. G. (2016). Accent, gender, and perceived competence. *Hispanic Journal of Behavioral Sciences*, *38*(2), 166–185. https://doi.org/10.1177/0739986316632319

Nguyen, L. T., Hung, B. P., Duong, U. T. T., & Le, T. T. (2021). Teachers' and learners' beliefs about pronunciation instruction in tertiary English as a foreign language education. *Frontiers in Psychology*, *12*, 739842. https://doi.org/10.3389/fpsyg.2021.739842

Park, G.-P., & Lee, H.-W. (2006). The characteristics of effective English teachers as perceived by high school teachers and students in Korea. *Asia Pacific Education Review*, *7*(2), 236–248. https://doi.org/10.1007/BF03031547

Peirce, J., Gray, J. R., Simpson, S., MacAskill, M., Höchenberger, R., Sogo, H., Kastman, E., & Lindeløv, J. K. (2019). PsychoPy2: Experiments in behavior made easy. *Behavior Research Methods*, *51*(1), 195–203. https://doi.org/10.3758/s13428-018-01193-y

Piccolo, S., & Baese-Berk, M. (2022). Effect of accent perception on the perception of professionalism. *University of Pennsylvania Working Papers in Linguistics*, *28*(2), Article15. https://repository.upenn.edu/handle/20.500.14332/45367

Porte, G., & McManus, K. (2019). *Doing replication research in applied linguistics*. Routledge. https://doi.org/10.4324/9781315621395

Purnell, T., Idsardi, W., & Baugh, J. (1999). Perceptual and phonetic experiments on American English dialect identification. *Journal of Language and Social Psychology*, *18*(1), 10–30. https://doi.org/10.1177/0261927X99018001002

Ramjattan, V. A. (2019). The white native speaker and inequality regimes in the private English language school. *Intercultural Education*, *30*(2), 126–140. https://doi.org/10.1080/14675986.2018.1538043

Rubin, D. L. (1992). Nonlanguage factors affecting undergraduates' judgments of nonnative English-speaking teaching assistants. *Research in Higher Education*, *33*(4), 511–531. https://doi.org/10.1007/BF00973770

Ruecker, T., & Ives, L. (2015). White native English speakers needed: The rhetorical construction of privilege in online teacher recruitment spaces. *TESOL Quarterly*, *49*(4), 733–756. https://doi.org/10.1002/tesq.195

Ryken, A. M., Tupper, E., & Weatherhead, D. (2024). Learning linguistic diversity: Listeners have race-based linguistic expectations, but only for phonological variation. *Journal of Experimental Psychology: General*, *153*(11), 2918–2930. https://doi.org/10.1037/xge0001560

Snodgrass, J. G., & Vanderwart, M. (1980). A standardized set of 260 pictures: Norms for name agreement, image agreement, familiarity, and visual complexity. *Journal of Experimental Psychology: Human Learning and Memory*, *6*(2), 174–215. https://doi.org/10.1037/0278-7393.6.2.174

Tripp, A., & Munson, B. (2021). Written standard sentence materials convey social information. *JASA Express Letters*, *1*(12), 125202. https://doi.org/10.1121/10.0007466

Trofimovich, P. (2016). Interactive alignment: A teaching-friendly view of second language pronunciation learning. *Language Teaching*, *49*(3), 411–422. https://doi.org/10.1017/S0261444813000360

von Esch, K. S., Motha, S., & Kubota, R. (2020). Race and language teaching. *Language Teaching*, *53*(4), 391–421. https://doi.org/10.1017/S0261444820000269

Watson Todd, R., & Pojanapunya, P. (2009). Implicit attitudes towards native and non-native speaker teachers. *System*, *37*(1), 23–33. https://doi.org/10.1016/j.system.2008.08.002

Yoon, K. (n.d.). *Normalize intensity-dB* [Praat script].

Young, R. (1999). Sociolinguistic approaches to SLA. *Annual Review of Applied Linguistics*, *19*, 105–132. https://doi.org/10.1017/S0267190599190068

Shannon Barrios is an Associate Professor in the Department of Linguistics at the University of Utah and co-director of the Speech Acquisition Lab. In her work, she uses techniques from psycholinguistics to study the adult acquisition of the phonology

https://doi.org/10.1017/S0261444826101463 Published online by Cambridge University Press

of a new language. She is especially interested in the learning of new phonological contrasts and phonological processes and the factors that influence this development, including prior language experience, exposure to written input, and learners' beliefs about accents.

Rachel Hayes-Harb is a Professor of Linguistics and Associate Dean of the Honors College at the University of Utah (Salt Lake City, Utah, United States). Her scholarship focuses on a variety of phenomena related to the acquisition of the sound systems of new languages by adult learners, specifically the development of sound inventories and the sound structure of words. Her research typically involves experimental investigations of the perception of new sounds and words, and the influence of various types of linguistic experience on adults' linguistic development. She co-directs the Speech Acquisition Lab[2].

Cite this article: Barrios, S., & Hayes-Harb, R. (2026). Learners' beliefs about teachers' social characteristics influence their pronunciation preferences: A replication and extension of Hayes-Harb, Barrios & Tripp (2022). *Language Teaching*, 1–21. https://doi.org/10.1017/S0261444826101463

https://doi.org/10.1017/S0261444826101463 Published online by Cambridge University Press