Teaching to Suppress Polglish Processes

Katarzyna Dziubalska-Kołaczyk, Anna Balas, Geoffrey Schwartz, Arkadiusz Rojczyk and Magdalena Wrembel

Abstract Advanced second language (henceforth L2) learners in a formal setting can suppress many first language (henceforth L1) processes in L2 pronunciation when provided with sufficient exposure to L2 and meta competence (see Sect. 4 for a definition of this term). This paper shows how imitation in L2 teaching can be enhanced on the basis of current phonetic research and how complex allophonic processes such as nasal vocalization and glottal stop insertion can be suppressed using "repair"—a method of providing learners with adequate input, so that they can use the L1 processes to improve L2 pronunciation.

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K. Dziubalska-Kołaczyk · A. Balas (✉) · G. Schwartz · M. Wrembel
Adam Mickiewicz University in Poznań, Poznań, Poland
e-mail: abalas@wa.amu.edu.pl

K. Dziubalska-Kołaczyk
e-mail: dkasia@wa.amu.edu.pl

G. Schwartz
e-mail: geoff@wa.amu.edu.pl

M. Wrembel
e-mail: magdala@wa.amu.edu.pl

A. Rojczyk
University of Silesia, Katowice, Poland
e-mail: arkadiusz.rojczyk@us.edu.pl

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1 Introduction

Phonetics has usually been taught by means of repetition after the model and explanation of the target language phonemic category compared to that of L1. This paper advocates improving the two methods on the basis of "repair" and recent research on imitation. The "repair" method stems from Natural Phonology, whose basic assumptions with regard to phonological processes, the role of phonetic detail in L2 and the task of an L2 learner are presented in Sect. 1. Section 2 is devoted to the presentation of research on imitation and an experiment, while the idea that L1 processes can be used to enhance L2 pronunciation if learners are provided with an appropriately modified context is presented in Sect. 3. Our proposals are formed as suggestions for pronunciation coursebook design and classroom use.

1.1 Processes in Natural Phonology

If phonetics deals with regularities in speech typical for a given language, then phonology has a two-fold task. On the one hand phonology looks for phonemically meaningful regularities, on the other hand it tries to explain these regularities and determine why they occur in a given language. In other words, phonology is about the priorities the speech system of a given language has. Phonology chooses from what phonetics has to offer on more arbitrary bases. The phonology of a language organizes and changes its categories and processes within a system that serves speech production and speech perception. The task of a phonologist is then seen as a search for phonetic details that are crucial in a given language, the word "crucial" referring to phonemic differences and phonetic details responsible for the characteristic of a given language or its accents.

1.2 Phonetic Detail in L2

Especially in second language acquisition, phonology has to incorporate phonetic detail, as reasoning based on phonemic categories alone is not capable of accounting for second language speech phenomena. Phonemic categories are insufficient, too vague, to be used for an analysis of second language acquisition, because their *tertium comparationis* has too narrow a spectrum. Haspelmath (2006) emphasized: "an important consequence of the non-existence of pre-established categories for language typology is that comparison cannot be category-based, but must be substance-based, because substance (unlike categories) is universal." Similar as L1 and L2 sounds might seem, phonemes in L1 and L2 do not reflect identical, pre-defined categories, but are specified by each language separately. Each language chooses its own set of sound categories and defines these categories at least slightly differently, specifying phonetic details in a unique way. Therefore

no two languages have the same set of sound categories with the same phonetic specifications. Such unique arrangements of sound specifications are possible because, as Dziubalska-Kołaczyk (2003) emphasizes, under universal constraints and language-specific conventions, the phonology of each language chooses from a wide range of options that phonetics offers.

Second language learners "know" precisely though not overtly the properties of the categories belonging to their L1, but not to L2. What they have at their disposal when acquiring L2 is the acoustic signal and phonetic detail, along with the morphological and syntactic structures they have learned. In terms of the influence of their first language, they are used to paying attention to some details, but disregarding others. In other words, second language learners do not have access to the phonological system of the second language otherwise than through phonetics. What reaches their ears is the acoustic signal which has to be deciphered. It is deciphered according to first language processes, and in doubtful cases universal processes often apply. The application of L1 and universal processes to the L2 acoustic signal leads to the determination of interlanguage underlying representations. What is produced by second language learners is produced on the basis of these often misperceived underlying representations. Pronunciation training or mastery consists in learning which phonetic detail to disregard, which L1 processes to suppress, and to which phonetic details attention should be paid. Thus teaching or learning L2 pronunciation consists in teaching or learning what L2 phonology chooses from phonetics.

1.3 The Task of an L2 Learner

L2 adult learners do not start learning L2 in a vacuum. It has long been suggested that L1 acts as a "sieve" filtering out speech features which are not significant in the first language phonological system (Polivanov, 1932; Trubetzkoy, 1939/69). A particular contribution of Natural Phonology (Stampe, 1969; Donegan & Stampe, 1979, 2009), to second language phonology research is that L2 learners are equipped with L1 categories, or to be more precise, underlying representations as specified by L1, and that L1 dynamic, preference-based, subconscious processes become active to shape sounds and sound sequences in interlanguage. In new contexts, universal processes,[1] the use of which is not evident in either L1 or L2, are

[1] Stampe's natural processes are universal (see Stampe, 1972, Donegan & Stampe, 2009). In Modern Natural Phonology there are universal process types and language-specific processes. In Natural Phonology, however, "universal" does not mean "active in all languages" (there are very few such universals, i.e. every language has vowels and consonants, every language has rhythm and intonation). "Phonological processes are universal in form, because they are universal in phonetic motivation, but they do not apply universally" (Donegan & Stampe, 2009, p. 8). Similarities between the 6000 languages of the world stem from the fact that speech is produced using the speech apparatus. The speech apparatus determines some criteria according to which languages

used in second language acquisition. These are present when a given process, or even processes, did not have a chance to emerge in L1 because of the lack of a specific context. Its or their use is restricted or suppressed in L2, but L2 learners have not managed to limit the process in accordance with L2 phonology (e.g., as it often happens with Japanese learners of English who devoice final obstruents, although Japanese does not have final obstruents, so it is not a process transferred from L1) (Stampe, 1969; Flege & Davidian, 1984). With time, more universal and L2 processes come into play, as the learner notices that L1 processes are not sufficient to represent L2 sounds.

2 Imitation

Speech imitation takes place when a talker converges with an interacting partner by taking on acoustic characteristics of their speech (Babel, 2012). Imitation has an important role in human acquisition and processing of speech. Imitative tendencies are observed in many cognitive domains of human behaviour, such as reproducing actions and intentions of others (Hauser, 1996; Honorof et al., 2011; McHugo et al., 1985; Nagell et al., 1993). Such convergence may be evoked in imitation of single words (Goldinger, 1997, 1998; Goldinger & Azuma, 2004; Namy et al., 2002) as well in conversational interactions (Pardo, 2006; Pardo et al., 2010, 2012). An array of phonetic properties have been reported to undergo convergence, such as accent, speaking rate, intensity, variation of frequency bands, long-term average spectra, frequency of pauses, and utterance length (Bourhis & Giles, 1977; Giles, 1973; Giles et al., 1991; Goldinger, 1997; Gregory, 1990; Namy et al., 2002; Natale, 1975; Pardo et al., 2012). Other studies have shown that convergence as a result of imitation may occur for VOT (Nielsen, 2011; Shockley et al., 2004), formant frequencies of vowels (Babel, 2010, 2012; Evans & Iverson, 2007; Pardo et al., 2010, 2012), fundamental frequency (Babel & Bulatov, 2012; Bailly, 2003; Gregory & Webster, 1996; Gregory et al., 1993, 1997, 2001; Kappes et al., 2009) or the distance between F2 and F1 in /l/ productions (Honorof et al., 2011).

All the above taken together, it is not surprising that repetition has always had a pivotal role in pronunciation teaching. Taking on acoustic characteristics of a model in repetition is intuitively felt to be the most natural way of inducing a learning

(Footnote 1 continued)
function. Phonological processes are innate and universal—not in the sense of "Universal Grammar", but rather in the sense that they are natural responses to the phonetic difficulties encountered in speaking. They are universal because the human vocal and perceptual apparatus is universal—not because they are somehow part of the human brain. They may be discovered by the child in the process of using his vocal tract—during vocalization, crying, or babbling—and still we call them "innate", since their origins and motivations are innate" (Donegan & Stampe, 2009, p. 6). Nevertheless, there are different ways in which languages adapt to the criteria. Further diversification has psychological, physiological and sociological motivation. A "universal" natural process means phonetically plausible and potentially possible.

process. Although, as reviewed earlier, most of the research on imitation and convergence has focused on speech in L1, non-native speakers also been demonstrated to converge with the model talker, thus temporarily overcoming their L1 speech habits. Non-native speakers have been observed to converge with their native interlocutors in conversational interactions (Beebe, 1981; Young, 1988; Zuengler, 1982) as well as in laboratory conditions in immediate shadowing of the model talker. A series of experiments with Polish learners of English has shown a significant degree of imitation of non-native speech properties such as longer VOTs for voiceless stops (Rojczyk, 2012a), formant frequencies for low front /æ/ (Rojczyk, 2012b), unreleased stops in stop clusters (Rojczyk et al., 2013), and vowel duration as a cue to the voicing of following stops (Zając, 2013; Zając & Rojczyk, 2013).

The applicability of imitation in L2 speech learning must consider some aspects that have been found to affect the magnitude of convergence. First, Goldinger (1998, 2000) reported that low-frequency words engender more imitation than high-frequency words. As a result, a pronunciation course should consistently manipulate lexical frequency of practised items to find a compromise between the need for correct pronunciation of frequent words and sufficient attention to phonetic detail in repetition. Second, model productions for imitation may be characterised by exaggeration of the practised feature. Such exaggeration will attract perceptual attention and is likely to be reproduced in imitation, as demonstrated by Shockley et al. (2004), who artificially extended VOTs that were imitated in shadowing. Finally, students should be exposed to the model voice that not only provides target parameters for imitation, but which also induces an implicit positive attitude. The research inspired by the Communicative Accommodation Theory (Giles et al., 1991; Giles & Ogay, 2007) has demonstrated that the magnitude of convergence and successful imitation are influenced by a complex pattern of interactions between self-reported feeling of closeness in relationship (Pardo et al., 2012), attractiveness rating (Babel, 2012) and status (Giles et al., 1991; Gregory & Webster, 1996).

2.1 Experiment

As a part of a larger project on sandhi in L2 speech, Schwartz, Balas and Rojczyk have examined how imitation reduces glottalization and devoicing in Polish-accented English. Our objective was to study the link between liaison, glottalization and devoicing. In this section we would like to present an acoustic study of C#V sequences in the speech of Polish learners of English. In particular, we examine the relationship between the glottalization of 'word-initial' vowels and the realization of 'word-final' voiced obstruents. In Polish word-initial vowels are glottalized (i.e. preceded by a glottal stop) (Dukiewicz & Sawicka, 1995; Malisz et al., 2013; Schwartz, 2013), whereas 'word-final' underlyingly voiced obstruents are realized as voiceless (Keating, 1979; Slowiaczek & Dinnsen, 1985; Jassem & Richter, 1989). In English these processes do not typically apply. We hypothesize that the suppression of glottalization facilitates the acquisition of C#V liaison, which in turn

Table 1 The overview of task effects on the percentage of consonant voicing, vowel/consonant ratio, percentage of liaisons and percentage of intrusive vowels

Parameter	Reading	Imitation	Native model
% voiced	46.5	64.6	76.2
10 × V/C	23.2	27.8	43
% liaison	14	47	77
% intrusive	27	17	17

facilitates the production of 'word-final' voiced consonants. We analyzed acoustically C#V word boundaries in 35 sentences, in which there were 20 tokens with final /d/ and 15 other tokens, including voiced clusters and voiced fricatives. 16 advanced Polish learners of English completed reading and repetition tasks. The assumption was that in Polish-accented English L1 interference in the form of glottalization prevents C#V liaison and therefore reinforces the context for final devoicing. It was hypothesized that successful production of liaison should enhance native-like production of final voiced obstruents. In the imitation experiment 35 C#V tokens were excised from a sentence list read by native speakers of English and then we asked Polish subjects to imitate the English models (see Appendix 1 for a list of sentences read by Polish and English native speakers and parts of the sentences which were used in the imitation experiment).

English native speakers produced 27 liaised tokens (where no glottalization or pause was visible before the vowel), out of 35, in six tokens a vowel was inserted, and two tokens were unliaised and glottalized. Liaison and vowel intrusion were conducive to voicing.

Results in Table 1 indicate that imitations were closer than read tokens to the native speaker model across all parameters. More detailed results showed that certain speakers did not improve on vowel/consonant ratio, but a closer analysis revealed that they employed much more vowel intrusion in the reading task and that they turned to liaisons in the imitation task. These imitation results show that acquisition is within reach.

3 "Repair": Exploiting L1 to Enhance L2 Pronunciation

3.1 The Idea of "Repair"

The idea behind the "repair" strategy is that speech is actually in the ear of the listener. If we try to replicate the listener's subconscious mental operations upon hearing a word in L2, we may understand how "repair" guides the listener from an unfamiliar intention to a familiar production (see [6] for details). When a native speaker of English hears a Polish word *ptak* [ptak] 'bird', we assume that s/he tries to mentally map it on a familiar L1 string of sounds. The mapping fails, because there are no words beginning with [pt] in English. There appear certain near matches as *potato* or *potentially* in which the [pt] cluster is broken by an unaccented

vowel. An English native speaker then assumes that the speaker of Polish must have deleted a vowel in the word *ptak* and in their careful speech s/he decides to suppress the deletion—this being a moment of repair, where deciphering an unfamiliar intention leads to a familiar production [pə'tak]. It is a suppression of a putative vowel deletion process of a second language—a putative lenition which actually manifests itself as a vowel insertion in the learner's careful production of a second language word, i.e. what amounts to a fortition.

Supposedly, the learner suppresses the vowel deletion process since there is no vowel deletion or a /pt/ sequence in L1. Let us check if it is really the case. In fact, in casual speech *potato* can be pronounced as [pə'teɪtoʊ] with a very short voiced vowel or as [p'teɪtoʊ]. Native speakers of English are not aware of the latter version, because their underlying form contains a vowel /ə/ between /p/ and /t/.

A solution to an unwelcome "repair" should be looked for in the L2 learner's native language. We should look for a process suppressed by "repair," for example, in the learner's casual speech phonology. To make the learner use the same process in the relevant context in a second language, we should provide him/her with an appropriate input to the process, i.e. an underlying intention different from the actual L2 output we want to achieve. In the case under discussion, the learner should try to say /pə'tak/, which would be expected to trigger the application of his/her native English unaccented vowel deletion to arrive at the target /p'tak/. Eliminating the schwa is a step towards gaining a better pronunciation, although the details, as for example places of articulation or other allophonic processes, need be empirically verified. To facilitate the pronunciation learning procedure, adult learners should be made aware of the process applying in their own casual speech (cf. also Wrembel, 2005).

3.2 Examples of L1 Processes Modified to Be Used in L2

Nasal vocalization in sequences of vowels, nasals and fricatives and glottal stop insertion are transferred from Polish to English even by advanced learners (Bogacka, 2007). Apart from telling learners not to vocalize nasals before fricatives in English (i.e. substitute a nasal semivowel, as it happens in Polish, for example the word *sens* is pronounced as /sew̃s/) and asking them to imitate native speech, we can suggest using processes from Polish in a modified context. Nasal vocalization in Polish requires a fricative after the nasal. Having localized a problem with an English word *sense* which has its Polish counterpart *sens* [sɛw̃s], we can ask learners to say *sen* [sɛn] 'sleep', then we add a consonant which does not induce nasal vocalization after the nasal *sen Basi* [sɛn baɕi] 'Basia's sleep', then we add a word beginning with a fricative [sɛn swabɨ] 'weak sleep'. In English we try to split the word *sense* into [sen. s] and then we gradually shorten the pause between the nasal and the fricative, ensuring that the nasal is not substituted by a nasal semivowel.

When trying to eliminate glottal stop insertion[2] in the beginning of words starting with a vowel, we first need to make sure that learners know what a glottal stop is, as many Polish speakers are not aware of its existence, because it does not have a phonemic status in Polish or a letter corresponding to it. We ask students to say *panna* [panna] 'maiden' and then to say [p.anna] slowly and then we compare [p.anna] to *Anna* [ʔanna] 'Ann' where a glottal stop is inserted by Polish native speakers, as it is usually the case before word-initial vowels. Emphasizing correspondences between L1 and L2 processes, even if applied in different contexts, can help students use the processes in L2.

4 Metacompetence

One of the core concepts related to L1 repair is the construct of linguistic meta-awareness, henceforth referred to as metacompetence. It implies conscious attention to a particular linguistic form and its manipulation. Sobkowiak (1991, p. 131) uses the term in the following sense: "[f]unctioning metalinguistically speakers/listeners concentrate on the language itself, deliberately inspecting and manipulating it from the outside". It is thus assumed that foreign language pronunciation may improve though gradual monitoring of an acquired system based on a conscious knowledge of and about the language.

The notion of metacompetence alludes to the distinction in cognitive psychology between 'declarative knowledge' and 'procedural knowledge' that has been also applied to Second Language Acquisition (SLA). Broadly speaking, declarative linguistic knowledge refers to a speaker's knowledge of linguistic facts, whereas procedural knowledge refers to know-how in using the language. In the course of skill development declarative knowledge is converted into procedural form, i.e. it gets proceduralised and leads to L2 competence.

Wrembel (2005) advocates to interpret phonological metacompetence as a multilevel construct consisting of the three following aspects: metalinguistic consciousness, explicit formal instruction, and first language competence. In the light of the present discussion the final component seems particularly relevant. Phonological metacompetence is believed to benefit from drawing on a learner's first language competence as a complete detachment from the native tongue is neither psychologically possible nor pedagogically desirable.

[2] As the anonymous reviewer notes, this might seem to be a minor problem, because many native speakers of English insert a glottal stop in this context. Nevertheless, a glottal stop insertion in English seems to function primarily as a marker of higher-level prosodic constituents (Dilley et al., 1996). An additional complication may be observed in a recent study (Davidson & Erker, 2014), which suggests that glottalization in English is increasing in frequency in linguistically diverse urban areas. Nevertheless, since English pronunciation instruction in Poland and many other countries is based on traditional vernacular varieties, we shall consider non-glottalized pronunciations, produced with modal phonation, as the target for acquisition.

This assumption corresponds to the notion of 'psycholinguistic learning strategy' as proposed by Faerch and Kasper (1986) which consists in conscious reliance on a L2 learner's prior linguistic knowledge of the first language (L1) or any other foreign language (Ln) to form hypotheses about L2, in contrast to a purely inductive strategy that relies solely on the L2 intake. A similar stance was embraced also in the naturalist perspective by Dziubalska-Kołaczyk (2002) who called for raising language awareness through the mediation of the first language. Making learners aware of the 'competences' they already possess may thus constitute a methodological remedy targeted at suppressing the L1 interference and reinforcing the process of L2 acquisition.

The proposed concept of developing phonological metacompetence entails practical recommendations for the teaching of L2 pronunciation that may be translated into specific classroom practices. The scope of potential techniques for the development of phonological metacompetence is multifarious ranging from alternative and innovative methods integrating cognitive, affective and psychomotor aspects of pronunciation learning to more mainstream activities involving conscious analysis of theoretical linguistic knowledge. The former include general awareness-raising techniques incorporating extra- and para-linguistic elements such as gestures, mimicry or relaxation in order to foster conscious control of articulators and perceptual tuning-in. The latter correspond to more elaborate practices that often rely on advanced technologies providing a new range of feedback and presentation modes. For a detailed presentation of specific classroom techniques aimed at developing phonological metacompetence based on different degrees of explicitness, on the one hand, and elaboration, on the other (see Wrembel, 2005).

All in all, through developing phonological metacompetence by drawing, among others, on the learner's first language competence, we can facilitate the process of acquisition of foreign language phonology and the development of L2 competence.

5 Conclusions

The paper has proposed imitation and "repair" methods for enhancing pronunciation teaching to second language learners in a formal context, in accordance with current research in phonetics and phonology.

Imitation tasks for pronunciation practice should be consciously designed by pronunciation coursebooks' authors and teachers so that they maximally enhance phonetic accommodation by using less frequent words, exaggeration, and employing friendly peer models with whom learners will be eager to identify.

The notion of "repair" has been proposed to account for the way in which listeners subconsciously react to second language speech. Upon hearing foreign speech, the listener tries to decipher the signal using their own native language processes. When "making up what has gone wrong in L2", the listener suppresses processes which "must have happened in L2" to result in the output s/he hears. The suppressed processes can often be found in the listener's native casual speech. If so,

we can make learners aware of these processes, and exploit them in a prepared context which is challenging in L2. Similarly to conscious learning of syntax and morphology, conscious knowledge of grammar is advocated on the level of phonetics and phonology.

Enhancing imitation and enabling students to use L1 processes in L2 should result in more effective L2 pronunciation training.

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Appendix

Stimuli for the production and imitation experiment. The parts of the sentences which were excised, presented to the subjects as read by native speakers, and recorded to test the effects of imitation, are italicized.

They *had evenings* together after she quit her job.
The child had *red ears*.
They *made everyone* stay quiet.
There is a big dark *cloud overhead*.
I *found out* too late about the party.
The band *bowed after* playing the song.
Frank *showed everyone* his new pad.
Hard apples are my favorite.
The kids *made excellent* cookies.
Bill *stayed after* class to talk to the teacher.
I'm *afraid Alice* will be late.
The band *played easy* songs to dance to.
We *paid everyone* about two pounds.
I *tried everything* but I couldn't make it work.
Brad even forgot the car keys.
They *should arrive* around eight.
The *judge ordered* us to pay the fine.
I've *had easier* tests than this one.
We *stayed out* all night.
I *tried out* the new computer.
She was all *tired out* after work.
They *earned equal* amounts of money.
Her *friend Eve* is very nice.
I *tried eel* for the first time in a Japanese restaurant.
Ted's apples are hard and sour.
Rob avoids Alice's uncle.

Mary's earrings are made of aluminium.
I bought *five extra* pounds of apricots.
Peg's other sister likes to *ride every* day.
George often sings after school.
Fred's aunt is 80 years old.
Jazz always was Adam's favorite music.
Today's express train was over 2 h late.
Fred always fills up his tank.

References

Babel, M. (2010). Dialect convergence and divergence in New Zealand English. *Language in Society, 39*, 437-456.

Babel, M. (2012). Evidence for phonetic and social selectivity in spontaneous phonetic imitation. *Journal of Phonetics, 40,* 177-189.

Babel, M., & Bulatov, D. (2012). The role of fundamental frequency in phonetic accommodation. *Language and Speech, 55*, 231-248.

Bogacka [Balas], A. (2007). Repopulating vowel space. Unpublished PhD thesis, Poznań: Adam Mickiewicz University.

Bailly, G. (2003). Close shadowing natural versus synthetic speech. *International Journal of Speech Technology, 6*, 11-19.

Beebe, L. (1981). Social and situational factors affecting the communicative strategy of dialect code-switching. *International Journal of the Sociology of Language, 32*, 139-149.

Bourhis, R. Y., & Giles, H. (1977). The language of intergroup distinctiveness. In H. Giles (Ed.), *Language, ethnicity and intergroup relations* (pp. 119-135). London: Academic Press.

Davidson, L., & Erker, D. (2014). Hiatus resolution in American English: the case against glide insertion. *Language*, *90(2)*, 482-514.

Dilley, L., Shattuck-Hufnagel, S., & Ostendorf, M. (1996). Glottalization of word-initial vowels as a function of prosodic structure. *Journal of Phonetics*, *24(4)*, 423-444.

Donegan, P., & Stampe, D. (1979). The study of Natural Phonology. In D. A. Dinnsen (Ed.), *Current approaches to phonological theory* (pp. 126-173). Bloomington: IUP.

Donegan, P., & Stampe, D. (2009). Hypotheses of Natural Phonology. *Poznań Studies in Contemporary Linguistics, 45(1),* 1-31.

Dukiewicz, L., & Sawicka, I. (1995). *Fonetyka i fonologia*. Kraków: Wydawnictwo Instytutu Języka Polskiego PAN.

Dziubalska-Kołaczyk, K. (2002). Conscious competence of performance as a key to teaching English. In E. Waniek-Klimczak, & P. J. Melia (Eds.), *Accents and speech in teaching English phonetics and phonology* (pp. 97-106). Frankfurt: Peter Lang.

Dziubalska-Kołaczyk, K. (2003). How learners "repair" second language phonology and whether they may become native speakers. In E. Waniek-Klimczak, & W. Sobkowiak (Eds.), *Dydaktyka fonetyki języka obcego. Neofilologia* (pp. 31-64). Płock: Zeszyty Naukowe PWSZ w Płocku.

Evans, B. G., & Iverson, P. (2007). Plasticity in vowel perception and production: A study of accent change in young adults. *Journal of the Acoustical Society of America, 121*, 3814-3826.

Faerch, C., & Kasper, G. (1986). Cognitive dimensions of language transfer. In E. Kellerman, & M. Scharwood Smith (Eds.), *Crosslinguistic influence in second language acquisition* (pp. 49-65). New York: Pergamon.

Flege, J. E., & Davidian, R. D. (1984). Transfer and developmental processes in adult foreign language speech production. *Applied Psycholinguistics, 5*, 323–347.

Giles, H. (1973). Accent mobility: A model and some data. *Anthropological Linguistics, 15*, 87-109.
Giles, H., Coupland, J., & Coupland, N. (1991). *Contexts of accommodation: Developments in applied sociolinguistics*. Cambridge University Press.
Giles, H., & Ogay, T. (2007). Communication Accommodation Theory. In W. Samter, & B. B. Whaley (Eds.), *Explaining communication. Contemporary theories and exemplars* (pp. 293-310). New Jersey: Lawrence Erlbaum Associates.
Goldinger, S. (1997). Perception and production in an episodic lexicon. In K. Johnson, & J. W. Mullenix (Eds.), *Talker variability in speech processing* (pp. 33-66). San Diego: Academic Press.
Goldinger, S. (1998). Echoes of echoes? An episodic theory of lexical access. *Psychological Review, 105*, 251-279.
Goldinger, S. (2000). The role of perceptual epsiodes in lexical processing. In A. Cutler, J. M. McQueen, & R. Zondervan (Eds.), *Proceedings of SWAP Spoken Word Access Processes* (pp. 155-159). Nijmegen: Max Planck Institute for Psycholinguistics.
Goldinger, S., & Azuma, T. (2004). Episodic memory in printed word naming. *Psychological Bulleting Review, 11,* 716-722.
Gregory, S. W. (1990). Analysis of fundamental frequency reveals covariation in interview partners' speech. *Journal of Nonverbal Behavior, 14,* 237-251.
Gregory, S. W., Dagan, K., & Webster, S. (1997). Evaluating the relation between vocal accommodation in conversational partners' fundamental frequencies to perception of communication quality. *Journal of Nonverbal Behavior, 21*, 23-43.
Gregory, S. W., Green, B. E., Carrothers, R. M., & Dagan, A. (2001). Verifying the primacy of voice fundamental frequency in social status accommodation. *Language Communication, 21*, 37-60.
Gregory, S. W., & Webster, S. (1996). A nonverbal signal in voices of interview partners effectively predicts communication accommodation and social status predictions. *Journal of Personality and Social Psychology, 70,* 1231-1240.
Gregory, S. W., Webster, S., & Huang, G. (1993). Voice pitch and amplitude convergence as a metric of quality in dyadic interviews. *Language Communication, 13,* 195-217.
Haspelmath, M. (2006). Pre-established categories don't exist – consequences for language typology and description. Paper presented at the DGfS Annual Conference, February 22-24, Bielefeld Germany.
Hauser, M. D. (1996). *The evolution of communication*. Cambridge MA: MIT Press.
Honorof, D., Weihing, N. J., & Fowler, C. A. (2011). Articulatory events are imitated under rapid shadowing. *Journal of Phonetics, 39*, 18-38.
Jassem, W., & Richter, L. (1989). Neutralization of voicing in Polish obstruents. *Journal of Phonetics, 17,* 317-325.
Kappes, J., Baumgaertner, A., Peschke, C., & Ziegler, W. (2009). Unintended imitation in nonword repetition. *Brain and Language, 111,* 140-151.
Keating, P. (1979). A phonetic study of voicing contrast in Polish. Unpublished Ph.D. dissertation, Brown University.
Malisz, Z., Żygis, M., & Pompino-Marchal, B. (2013). Rhythmic structure effects on glottalisation: A study of different speech styles in Polish and German. *Laboratory Phonology. Journal of the Association for Laboratory Phonology, 4(1),* 119-158.
McHugo, G., Lanzetta, J., Sullivan, D., Masters, R., & Englis, B. (1985). Emotional reactions to a political leader's expressive displays. *Journal of Personality and Social Psychology, 49,* 1513-1529.
Namy, L., Nygaard, L., & Sauerteig, D. (2002). Gender differences in vocal accommodation: The role of perception. *Journal of Language and Social Psychology, 21*, 422-432.
Nagell, K., Olguin, K., & Tomasello, M. (1993). Processes of social learning in tool use in chimpanzees *(Pan troglodytes*) and human children *(Homo sapiens). Journal of Comparative Psychology, 107,* 174-186.
Natale, M. (1975). Convergence of mean vocal intensity in dyadic communication as a function of social desirability. *Journal of Personality and Social Psychology, 32,* 790-804.

Nielsen, K. (2011). Specificity and abstractness of VOT imitation. *Journal of Phonetics, 39,* 132-142.
Pardo, J. (2006). On phonetic convergence during conversational interaction. *Journal of the Acoustical Society of America, 119,* 2382-2393.
Pardo, J. S., Cajori Jay, I., & Krauss, R. M. (2010). Conversational role influences speech imitation. *Attention, Perception and Psychophysics, 72,* 2254-2264.
Pardo, J. S., Gibbons, R., Suppes, A., & Krauss, R. M. (2012). Phonetic convergence in college roommates. *Journal of Phonetics, 40,* 190-197.
Polivanov, E. (1932). La perception des sons d'une langue étrangère. *Travaux du Cercle Linguistique de Prague, 4,* 79-86.
Rojczyk, A. (2012a). Phonetic and phonological mode in second-language speech: VOT imitation. Paper presented at EUROSLA 22 - The 22nd Annual Conference of the European Second Language Association, September 5-8, Poznań Poland.
Rojczyk, A. (2012b). Phonetic imitation of L2 vowels in a rapid shadowing task. In J. Levis, & K. LeVelle (Eds.), *Proceedings of the 4th Pronunciation in Second Language Learning and Teaching Conference* (pp. 66-76). Ames, IA: Iowa State University.
Rojczyk, A., Porzuczek, A., & Bergier, M. (2013). Immediate and distracted imitation in second-language speech: Unreleased plosives in English. *Research in Language, 11*, 3-18.
Schwartz, G. (2013). Vowel hiatus at Polish word boundaries – phonetic realization and phonological implications. *Poznań Studies in Contemporary Linguistics, 49(4),* 557-585.
Shockley, K., Sabadini, L., & Fowler, C. A. (2004). Imitation in shadowing words. *Perception & Psychophysics, 66,* 422-429.
Slowiaczek, L., & Dinnsen, D. (1985). On the neutralizing status of Polish word-final devoicing. *Journal of Phonetics, 13,* 325-341.
Sobkowiak, W. (1991). Metaphonology of English paronomasic puns. *Proceedings of the 12th ICPhS, Aix-en-Provence, 5,* 130-133.
Stampe, D. (1972). *How I spent my summer vacation.* Columbus: Ohio State University Linguistics Department.
Stampe, D. (1969). "The acquisition of phonetic representation". In R. Binnick et al. (Eds.), *Papers from the Fifth Regional Meeting of the Chicago Linguistic Society Chicago: Chicago Linguistic Society* (pp. 443-454). (Reprinted in Stampe, 1979 (see Stampe, 1973) pp. vii–xxv and B. Lust, & C. Foley (Eds.) (2003) *First language acquisition: The essential readings* (pp. 307-315). Malden MA: Blackwell.)
Trubetzkoy, N. S. (1939/69). *Principles of phonology.* Berkeley: University of California Press.
Wrembel, M. (2005). Metacompetence-oriented model of phonological acquisition: implications for the teaching and learning of second language pronunciation. *Proc. PTLC 2005 London*, 1-5.
Young, R. (1988). Variation in the Interlanguage Hypothesis. *Studies in Second Language Acquisition, 10,* 281-302.
Zając, M. (2013). Phonetic imitation of vowel duration in L2 speech. *Research in Language, 11,* 19-29.
Zając, M., & Rojczyk, A. (2013). Imitation of English vowel duration upon exposure to native and non-native speech. Paper presented at Accents 2013, December 5-7, Łódź Poland.
Zuengler, J. (1982). Applying Accommodation Theory to variable performance data in L2. *Studies in Second Language Acquisition*, *4*, 181-192.