



DOSSIÊ: PSICOLINGÜÍSTICA E NEUROLINGÜÍSTICA EM INTERFACES

## Social indexicality and L2 speech development: underexplored dynamic routes in psycholinguistics

*Indexicalidade social e desenvolvimento da fala em L2: caminhos dinâmicos subexplorados em psicolinguística*

*Indexicalidad social y desarrollo del habla en L2: vías dinámicas subexplotadas en psicolingüística*

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**Abstract:** The propensity to see language as a construction that provides social cues has great implications for both societal structure and human psychological processes, including native (L1) and non-native language (L2) development and attrition. In this regard, social indexicality, for instance, has been shown to play a crucial role in L2 speech development. Even though some branches of linguistics embrace social indexicality in their machinery and predictions (e.g., sociolinguistics, sociophonetics), the addition of social variables in the area of Second Language Acquisition (SLA) and in Psycholinguistics might be seen as recent and limited. Considering that psycholinguistics should start including social indexicality when addressing language learning, this theoretical research article aims at exploring and drawing attention to the relationship between psycholinguistics and sociolinguistics in relation to L2 speech development. In order to do so, it provides an outline of the research agenda of L2 speech development as situated in psycholinguistics. It then discusses the role of social indexicality in bilingual development. Finally, the article advocates the Complex Dynamic Systems Theory (CDST) as a fruitful paradigm to anchor such an interface, since it includes both cognitive and social aspects in its core.

**Keywords:** L2 speech. Psycholinguistics. Social indexicality.

**Resumo:** A propensão de ver a língua como uma construção que fornece pistas sociais tem grandes implicações tanto para a estrutura da sociedade quanto para os processos psicológicos humanos, incluindo o desenvolvimento de línguas nativas (L1) e não nativas (L2), bem como fenômenos de atrito. Nesse sentido, a indexicalidade social, por exemplo, demonstra desempenhar um papel crucial no desenvolvimento da fala em L2. Embora alguns ramos da linguística acolham a indexicalidade social em sua maquinaria e em suas previsões (por exemplo, a sociolinguística, a sociofonética), a adição de variáveis sociais na área de Aquisição de Segunda Língua (ASL) e na Psicolinguística pode ser vista como recente e limitada. Considerando que a psicolinguística deva começar a incluir a indexicalidade social ao abordar o desenvolvimento de línguas, este artigo de pesquisa teórica tem como objetivo explorar e chamar a atenção para a relação entre a psicolinguística e a sociolinguística no que se refere ao desenvolvimento da fala em L2. Para tanto, apresenta-se um esboço da agenda de pesquisa em psicolinguística no que compete ao desenvolvimento da fala em L2. Em seguida, discute-se o papel da indexicalidade social no desenvolvimento bilingue. Finalmente, defende-se a Teoria dos Sistemas Dinâmicos Complexos (CDST) como um paradigma frutífero para ancorar tal interface, uma vez que ela abarca em seu núcleo aspectos tanto cognitivos quanto sociais.

**Palavras-chave:** Fala em L2. Psicolinguística. Indexicalidade social.

**Resumen:** La propensión a ver la lengua como una construcción que indica señales sociales tiene implicaciones importantes tanto para la estructura de la sociedad como para los procesos psicológicos humanos, incluido el desarrollo de lenguas nativas (L1) y no nativas (L2), así como los fenómenos de erosión o desgaste. En



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este sentido, se muestra que la indexicalidad social, por ejemplo, desempeña un papel crucial en el desarrollo del habla en L2. Aunque algunas ramas de la lingüística adoptan la indexicalidad social en su maquinaria y en sus predicciones (por ejemplo, la sociolingüística, la sociofonética), la adición de variables sociales en el área de Adquisición de Segundas Lenguas (ASL) y en la Psicolingüística puede verse como reciente y limitada. Teniendo en cuenta que la psicolingüística debe comenzar a incluir la indexicalidad social al abordar el aprendizaje de lenguas, este artículo de investigación teórica tiene como objetivo explorar y llamar la atención sobre la relación entre la psicolingüística y la sociolingüística en lo que respecta al desarrollo del habla en L2. Con este fin, se presenta un esbozo de la agenda de investigación psicolingüística sobre el desarrollo del habla en L2. Luego, se discute el papel de la indexicalidad social en el desarrollo bilingüe. Finalmente, se defiende la Teoría de los Sistemas Dinámicos Complejos (CDST) como un paradigma fructífero para anclar esa interfaz, ya que abarca en su núcleo tanto aspectos cognitivos como sociales.

**Palavras clave:** Habla en L2. Psicolingüística. Indexicalidad social.

## Introduction

It is undeniable that participating in social groups/speech communities is a ubiquitous feature of human life. Since the nineteenth century, Anthropology has made an effort to characterize human beings as such based on their habits, beliefs, kinship systems, political organizations, and, obviously, language (ERIKSEN, 2004; FERRARO; ANDREATTA, 2010; KOTTAK, 2011; MARCONI; PRESOTTO, 2022). Similarly, Linguistics and Psychology have been concerned about the genesis and the linguistic materiality of speakers' tendency to divide themselves and others into social groups, and, consequently, in a broad sense, to perform in categorizable ways (KINZLER, 2021). It is now clear, at least for those domains of investigation, that speech provides social information (PRESTON; NIEDZIELSKI, 2010; DRAGER, 2015). This way, language is then not only a means of conveying verbal meaning, but also a platform for indexing social information, such as the speakers' gender, ethnicity, age, and social class (SILVERSTEIN, 1976).

We can also say that language is a multimodal

and multidimensional cluster of linguistic and other semiotic practices for the display of identities in interaction (ECKERT; RICKFORD, 2001). Then, instead of assigning social and linguistic meaning in a correlational manner by the mapping between linguistic forms and social categories, as in earlier approaches to language variation and change, more recent models draw – either implicitly or explicitly – on the concept of indexicality, or contextually bound meaning (SILVERSTEIN, 1976, 2003).

The ability of language to convey social meaning beyond its literal meaning refers to social indexicality<sup>3</sup>. In other words, social indexicality congregates variables from our speech (e.g., our accent, dialect, word choice, intonation, and other linguistic features) that carry social information about our identity, background, personality, social status, group affiliation, and other characteristics. As a matter of fact, this concept is fundamental to the understanding of how language use is related to social identity and how language is used to create and reinforce social hierarchies and power relations.

Although social indexicality has been under scrutiny from several areas of science, linguistic anthropology, sociolinguistics and, more recently, sociophonetics, have been considered flagships in describing and investigating the ways in which languages are structured and, at the same time, end up structuring humans' social lives. The human propensity to see language as an organism that provides social cues has great implications for both societal structure and peoples' psychological processes (KINZLER, 2021), including first (L1) and second (L2) language development and attrition. In this regard, social indexicality, for instance, has been shown to play a crucial role in L2 speech development (BOURDIEU, 1977; GEE, 1990; GUMPERZ, 1982). Other branches of linguistics, such as Second Language Acquisition (SLA) and Psycholinguistics, should thus start considering social indexicality when addressing language

<sup>3</sup> The term social indexicality was first introduced by the sociolinguist John Gumperz in the 1980s. Gumperz was interested in understanding how linguistic variation was used to create and maintain social relationships, and he argued that language was a powerful tool for conveying social meanings beyond its literal content. According to the researcher, social indexicality was a crucial aspect of linguistic variation, and it could be used to reveal social structures, relationships, and processes.

learning, especially L2 speech development. Individuals acquiring the L2 sound system – in fact, any variety of it – must learn more than the phonetic-phonological rules of the target variety if they are willing to become linguistically and socially competent language users. They must also acquire the patterns of sociolinguistic variation found in the target language community (MEYERHOFF; SCHLEEF, 2012).

In the light of indexicality, the social meaning of linguistic forms is most fundamentally a matter not of social categories, but rather of fine and more transient interactional moves through which speakers take stances and create alignments (BULCHOLTS, 2009). In this sense, research has demonstrated that L2 learners who are more aware of social indexicality are better able to produce L2 speech that is appropriate for different social contexts (BLOCK, 2003). In addition, indexicality is particularly important as it can influence the pace and trajectory of L2 acquisition, as well as its outcome in terms of L2 speech production (KUPSKE, 2017). Nonetheless, psycholinguistics – long concerned with understanding the way in which linguistic knowledge is acquired, represented, and used – seems to be reluctant, at least in Brazil, in including social indexicality in its predictions, methods and discussions.

This article aims at exploring and drawing attention to the relationship between psycholinguistics and sociolinguistics regarding L2 speech development. In order to do so, in the first section of this work, we provide an outline of the research agenda of L2 speech development as situated in psycholinguistics. In the second section, we discuss, in general terms, the role social variables play in the development of L2 speech. The third section provides food for thought as to how psycholinguistics and sociolinguistics may benefit from each other concerning L2 speech development. At the same time, it brings up the Complex Dynamic Systems Theory (CDST), which will be advocated as a conciliatory paradigm in linguistics for the investigation of the phenomena targeted in this article.

## 1 The highways: L2 speech development in psycholinguistics

Research on speech sciences in psycholinguistics has developed significantly over the years, with a focus on the cognitive and neural processes that underlie speech perception and production. To illustrate this trend, we will concentrate on models of speech perception and production, especially the ones focusing on L2 development, and on the McGurk Effect, theoretical constructs with solid psychological bases.

A widespread model of L2 development is the one elaborated by Flege (1995), named Speech Learning Model (SLM). The SLM tries to explain how L2 learners acquire the sound system of a new language, and emphasizes the role of experience and input in shaping the way L2 learners perceive and produce the target sounds. The SLM includes three main components:

I. Perceptual assimilation: this component refers to the way in which L2 learners perceive the sounds of the new language. According to the SLM, L2 learners initially perceive new sounds in terms of the categories they have in their L1. As they become more experienced with the new language, their perceptual categories become more aligned with those of the new language, allowing them to perceive the sounds more accurately.

II. Phonetic coding: this component refers to the way in which L2 learners produce the sounds of the new language. In the SLM perspective, L2 learners initially produce new sounds using the articulatory patterns of their L1 and, as they gain experience with the L2, they learn to adjust their articulatory patterns to match the new ones more closely.

III. Working memory: this component refers to the cognitive processes involved in perceiving and producing the sounds of the L2. According to the SLM, working memory plays a critical role in the acquisition of L2 sounds as learners must be able to hold new categories in their memory and compare them to

those they are familiar with to learn the new sound system.

In 2021, James Flege and Ocke-Schwen Bohn revised the SLM (SLM-r) to incorporate additional factors that may influence the process of L2 speech development. The revised model makes reference to:

I. Perceptual learning: the way in which L2 learners develop new perceptual categories for the sounds of the new language. The SLM-r accentuates the role of experience and exposure in shaping these categories, as learners must be exposed to a wide range of exemplars to develop accurate and flexible perceptual categories.

II. Contextual variation: the way in which L2 learners master the new sound categories in different contexts, such as different social situations or linguistic registers. The SLM-r also emphasizes the importance of exposure to a number of contextual variations to develop a more robust and adaptable sound system.

III. Attentional resources: the cognitive resources required for L2 speech development. The model highlights the importance of attentional resources, particularly working memory capacity, in the process of learning L2 categories.

IV. L1 influence: the way in which the L1 may influence L2 speech development. The SLM-r acknowledges that the L1 may keep on influencing L2 speech perception and production, even as learners become more experienced with the new language.

By incorporating factors that may influence the way learners perceive and produce the L2 sounds, the SLM-r provides a comprehensive framework for understanding the process of L2 speech development.

Another theoretical framework that deserves

attention is the one coined by Escudero and Boersma (2004) and by Escudero (2005, 2009), called Second Language Perception Model (L2LP). The model is based on the idea that L2 learners are expected to perceive and produce the sounds of the new language accurately before they are able to achieve full proficiency. The L2LP model includes three stages of development:

I. The preattentive stage: this stage involves the learner's unconscious processing of the L2 categories, which occurs before they have any conscious awareness of the sounds of the language. The learner must first learn to recognize and distinguish the L2 sounds, an ability that requires exposure to the L2 categories and sound patterns.

II. The attentional stage: at this stage, the learner becomes aware of the L2 sounds and begins to consciously focus on them. The learner may also start to produce the sounds of the L2 and receive feedback from the environment.

III. The integrative stage: this final stage involves the learners' integration of the L2 sounds into their overall linguistic system, so that they can fully master the L2 phonology.

To Colantoni, Steele and Escudero (2015), the L2LP suggests that a native listener is equipped with a perception grammar<sup>4</sup>, which is a system that weighs and parses incoming acoustic values, and ultimately maps them onto abstract representations such as allophones or phonemes. Likewise, native listeners are optimal perceivers as their perception grammar can efficiently parse continuous acoustic values in reference to phonological representations.

Models such as the SLM, the SLM-r and the L2LP, along with other similar frameworks<sup>5</sup>, have significantly contributed to the understanding of L2 speech development, since our mental ability to distinguish between different sound categories

<sup>4</sup> Given the scope of this article, we will not tackle the notion of perception grammar. However, Colantoni, Steele and Escudero (2015) is an adequate reference for that purpose.

<sup>5</sup> The Perceptual Assimilation Model (PAM), created by Best (1995), and the Perceptual Assimilation Model for Second Language Speech Learning (PAM-L2), created by Best and Tyler (2007) are also examples of theoretical frameworks that have been used by researchers to address L2 speech development.

is critical for our linguistic knowledge. In addition to sound categories in isolation, researchers have also investigated the role of prosody (e.g., rhythm, stress, and intonation) in speech perception and production. Studies have shown that prosody plays an important role in conveying meaning and emotion in speech, and that listeners are able to use prosodic cues to disambiguate sentences and understand the speaker's intent (DILLEY; MATTYS; VINKE, 2010; JACKSON; O'BRIEN, 2011; MENNEN; DE LEEUW, 2014).

The way the brain operates in the comprehension of speech sounds has also led psychologically oriented researchers to make intriguing observations with respect to the mismatch between auditory and visual cues. The McGurk Effect was first described by researchers Harry McGurk and John MacDonald in 1976 and it corresponds to a perceptual phenomenon that occurs when auditory and visual pieces of information from speech are discrepant. Specifically, it occurs when a person sees a speaker's mouth movements that suggest one sound, while hearing a different sound being spoken. In this situation, people may perceive a third sound that is different from both the auditory and visual inputs. For example, if a person sees a speaker saying [ga], but hears a recording of someone saying [ba], the outcome may be the perception of [da]. This happens because the visual input of the speaker's mouth movement influences the perception of the auditory input. The McGurk Effect demonstrates the integration of different sensory inputs in the perception of speech. It also stresses the importance of both auditory and visual information in speech perception, and suggests that the brain combines these inputs in a complex and sophisticated manner to create the experience of speech.

The models described in this section and the applications of the McGurk Effect have contributed to theories and analyses of L2 speech development on psycholinguistic grounds. Findings derived from research studies aligned with that perspective exhibit important implications for fields such as speech pathology, education, and machine learning, for example. Nonetheless, they

picture language from a very localized, cognitive point of view, leaving other routes of investigation underexplored. For example, there is room for other variables to be taken into account in the psycholinguistics of L2 speech development, such as the so-called extralinguistic variables, which find their roots mostly in social oriented perspectives. Indeed, the addition of social variables in psycholinguistics might be seen as a recent and limited project.

Figueiredo (2018) mapped out and categorized the scientific production that has been published in the realm of SLA in Brazil since the social turn (BLOCK, 2003). According to the scholar, even though it seems that researchers have started to apply methods other than the quantitative ones (which can be taken as an enlargement in diversity), the traditional cognitivist research in Brazil is still very robust, covering around 60% of the scientific products in SLA. Only 7% of the studies investigated by Figueiredo (2018) had a psycholinguistic orientation, yet the author's data substantiates the anecdotal evidence that most research in psycholinguistics in Brazil is cognitively based and does not pay careful attention to social variables. In this vein, studies that try to combine L2 speech development and nonlinguistic variables are even more infrequent. In other words, L2 speech development studies that draw on a combination of ideas and methods from sociolinguistics, sociophonetics and psycholinguistics represent a reasonably late endeavor in L2 speech investigation. But what exactly do some social variables have to say concerning L2 speech development?

## 2 The crossroads: social variables and L2 speech development

The way we speak inevitably reflects our social identities and group memberships. For example, research has shown that factors such as age, gender, ethnicity, and socioeconomic status can all affect the way we speak, including the pronunciation of specific sounds and the use of certain words and grammatical structures (DARVIN; NORTON, 2022; HOWARD, 2022; KIM; WEBB,



2022; SCHOONMAKER-GATES, 2022; SINGLETON; PFENNINGER, 2022; SUZUKI, 2022).

Sociolinguists have investigated how linguistic features spread through populations and change over time, and how different social groups contribute to these changes. However, Ochs (1992), Silverstein (2003) and Eckert (2008) share the idea that the social significance of differences in language use is not solely determined by the groups to which individuals belong. Rather, it is influenced by the speaker's attitudes towards themselves and others, as well as societal norms and constraints that dictate the appropriate use of particular linguistic forms. For instance, the importance of language in society and people's tendency to essentialize certain groups of speakers can have significant implications for trust. Trust is a crucial component of human social interactions that can impact the acquisition of information, social relationships, and even fundamental societal institutions, such as legal systems (KINZLER, 2021). Therefore, considering that phonological patterns are emergent, we take into account the logic of action and social interaction as sources of symbolic operations (PEROZZO; KUPSKE, 2021). In other words, sound systems are also built from the outside in and are dependent on other speakers (ALBANO, 2020). In this perspective, speech production – together with its variation and change – is conditioned to external feedback, which would guide the selection, deselection and implementation of certain sounds (ALBANO, 2020).

Bybee (2001) and Albano (2001, 2020) establish that phonology is affected and driven by experience, and that the use of forms and patterns, both in production and in perception, impacts their storage in memory. To Albano (2020, p. 155), to accommodate oneself linguistically to a community is "to choose the members of that community whom to emulate and with whom to align". Accommodation demands and fosters a growing cognitive and social experience, which correlates with integration (KUPSKE, 2017, 2019). It would be the convergence patterns linked to integration that would lead to a more accentuated

speech adjustment, so that differences between individuals are reduced (ALBANO, 2020).

Language change is an ongoing process that happens not only across generations but also at the individual level (KUPSKE; PEROZZO; ALVES, 2019), occurring throughout individuals' lifetime and even in a single moment (KINZLER, 2021). As Kinzler (2021) points out, a great body of studies in sociolinguistics have demonstrated that people's social identities, particularly their aspirations, are revealed through their language. When people's social circumstances shift, their speech adapts to mirror their new surroundings. This extensive history of research attests the significant role of language in shaping and reflecting social dynamics. Therefore, the way an individual speaks is not fixed, but, rather, fluid. Even if an individual only speaks one language, the correspondent speech patterns can drift based on the evolution of social objectives in question (JIQUILIN-RAMIREZ *et al.*, 2013).

Research in sociophonetics has shown that these social factors affect the use of phonetic variables within one language (ECKERT, 2008; FOULKES; DOCHERTY, 2006) and that speakers alter phonetic-phonological features they use to show belonging or identification with a particular group (EVANS; IVERSON, 2004, 2007). For example, Evans and Iverson (2007) investigated speech perception and production in participants who moved from a small town in the center of England to study at university, where they met speakers of different accents, mainly the standard variety. Even though the participants maintained certain features of the home variety, they changed their production of others to better fit their new socio-semiotic landscape. This suggests that, even though with limits, speakers might be able to change certain aspects of their speech production at a relatively late stage in life.

Language change is also true for an individual developing an L2 (KUPSKE, 2021a, 2021b; KUPSKE; LIMA JR., 2022). However, little is known about how L2 speakers encode identity and other social variables through the use of their first and second languages. In other words, what do bilin-

guals “replicate” from the L1 in language contact situations in which the L2 phonetic-phonological input is variable? To Meyerhoff and Schleeff (2012), this question applies to all situations of language and dialect contact, but it seems that bilinguals rely on different aspects to engage and use variants rather differently from L1 speakers. Even though monolinguals and bilinguals must stratify their community into different cohorts and identify differences in the relative frequency of the variants from the speakers they have identified as members of those cohorts, sometimes non-native speakers of the target language create different categories or distinctions compared to monolinguals, occasionally failing to produce stylistic stratification found in native speakers (MEYERHOFF; SCHLEEF, 2012).

The way listeners use social cues to interpret speech has also been examined in the last few years. Studies have shown that listeners use information about a speaker's social identity to make inferences about their attitudes, beliefs, and behaviors (AMBADY; SKOWRONSKI, 2008; GILEAD; LIBERMAN, 2018; KUNDA, 1999; MILES *et al.*, 2011). As to speech production, recent work with L2 learners has highlighted the importance of identity in acquiring an L2. A study conducted by Drummond (2012) revealed that Polish migrants in Manchester were less likely to produce the local variant of <ing> if they were planning on returning to Poland, and more likely to adopt the local variant if they were planning on remaining in Manchester.

Additionally, psycholinguistic investigation on L1 attrition has revealed significant differences within migrant populations (KUPSKE; LIMA JR., 2022). For instance, according to Schmid (2010), some migrants are not identified as different from the monolingual compatriots while others are not even considered to be original members of the L1 community. Although L1 exposure/use is taken as a strong predicting factor for language

attrition, to Schmid and Dusseldorp (2010), the amount of L1 use had low impact on language attrition. According to Schmid (2010), the degree of L2 impact in bilinguals' use of the L1 varies drastically. Schmid (2002), for example, examines German Jews who fled from Germany during the Nazi regime. Even though the overall conditions of migration are very similar among some immigrants, great differences in language use were attested in terms of lexical richness, syntactic complexity, fluency, accuracy and foreign accent.

Focusing specifically on the case of German Jews that has just been mentioned, Schmid (2010) emphasizes that identity and identification with the L1 and its culture had an impact in the processes of attrition. For example, the German Jews who had emigrated from Germany between 1933 and 1935 experienced less language attrition, their speech was more lexically diverse and syntactically complex, and they were considered to have a low degree of foreign accent in their L1. In opposition, those who left Germany after the beginning of the massacre revealed the strongest signs of attrition. In this perspective, Schmid (2002, 2010) points out that even positive attitudes of speakers impact the way the L2 is developed and how it will influence the L1. As we have seen, L1 and L2 speech variability is conditioned by the situational context, which is sensitive to social and stylistic variables of the most diverse types (ALBANO, 2020).

Kupske (2016, 2017) explored the correlation between length of residence (LOR) in London and the production of word-initial English voiceless stops by two groups of late Southern Brazilian bilinguals: those who have had an integrative motivation towards the host language and culture, and those who have not. The studies showed that immigrants' Voice Onset Time<sup>6</sup> (VOT) values for English-L2 are positively correlated with LOR for those who are affiliated to the L2 language and context. To put it another way, the duration of the

<sup>6</sup> The term, whose acronym is VOT, refers to the relationship between the onset of vocal fold vibration and the opening of the articulators in stop consonants so that the pulmonic airstream is released. In the phonetic literature (ASHBY; MAIDMENT, 2005; KENT; READ, 1992; LADEFOGED, 2001; LISKER; ABRAMSON, 1964), three VOT parameters are described: i. negative VOT, in which the vibration of the vocal folds starts before the release of a stop; ii. zero VOT, in which the vibration of the vocal folds is roughly simultaneous to the release of a stop; and iii. positive VOT, in which the vibration of the vocal fold begins after the release of a stop.

English VOT, originally longer when compared to the Brazilian Portuguese (BP) VOT, increased through time, drifting towards the L2 values expected for Standard Southern British English<sup>7</sup> (SSBE) monolinguals. The same does not happen to non-integrated immigrants, although with the same length of residence in the L2-dominant setting. The studies demonstrated that LOR is an imprecise index to measure L2 development and/or L1 attrition. In a follow up study, Kupske and Lima Jr. (2022) specifically investigated the relationship between patterns of integration into the host language and context and L1 phonological adaptability (or, in other words, language attrition). The authors analyzed the BP VOT production, originally short (short lag), of immigrants in an English-dominant context. Bayesian linear regression models with mixed effects predicted, with high credibility, an increase in the BP VOT duration over time, with a larger increase predicted for the group of speakers affiliated with the L2-dominant context. Since individuals take language as a critical component of participation in social and cultural groups, new life paths and new social contexts might influence the way individuals use language, making L1 and L2 speech production and perception drift to new directions. The fact that only integrated immigrants have their L1 altered by the influence of the dominant L2 is evidence that linguistic change can be seen as a result of affiliation with a particular group (KINZLER, 2021).

According to Schmidt, Linford and Fafulas (2022), social factors such as language attitudes, social networks, identity, and peer pressure are decisive to the adoption of regional sounds in L2 speech, as these units carry socially indexed meaning. For instance, Ringer-Hilfinger (2012) found that learners who were participating in an exchange program in Madrid, Spain, were more likely to use the peninsular Spanish [l] if they had had contact back home with speakers who employed this variant than those learners who had not had contact with that same variant back home.

Likewise, Trimble (2013) observed that L2 Spanish learners studying in Mérida, Venezuela, used intonational patterns in the target language with the aim to sound like their Venezuelan friends.

The work by Dufour *et al.* (2014) is perhaps the most emblematic in relation to the theme. As described by Perozzo (2021), the research sought to understand how native speakers from Mauritius (whose L1 is the Mauritian Creole and whose L2 is French) perceived the [s]-[ʃ] contrast present in Standard French. The choice for this contrast is justified by the fact that both [s] and [ʃ] of Standard French are articulated as [s] in the Creole dialect at stake; therefore, both the word "sac" ([sak] in Standard French, which means "bag") and the word "chaque" ([ak] in Standard French, which means "each") are pronounced as [sak] in the Mauritian Creole. Half of the participants in the study was informed that the speaker who recorded the stimuli was a man, also from Mauritius, but was part of a privileged and educated social stratum – which would generate expectations that he was a supposedly educated and rich person and, thus, he should potentially establish sharp articulatory distinctions between [s] and [ʃ]. The other half of the participants received no information in that regard. As a result, possibly guided by the socially constructed and overestimated image of the man in question, the group of participants who had information about the speaker assigned him more instances of [ʃ] than the group of participants who did not know his identity. This is a very illustrative case of how the impressions we have of people, together with social variables, permeate the perception we get in terms of phonological variants.

In L2 development, there is a clear link between pronunciation and identity. It may be the case that learners may project a target character in the L2 to whom they can conform. According to Nagle (2022, p. 272), the pronunciation-identity connection may be especially sensitive for learners "who vary in their desire to assimilate linguistically and culturally to the local L2 community".

<sup>7</sup> According to Wells (1982) and Foulkes and Docherty (1999), SSBE is the variety that represents the English spoken in London.



Actually, L2 learners often give multifaceted, context- and time-specific reasons for adapting their pronunciation, as Marx (2002) showed in her self-study. In this case, Marx (2002) was an English native speaker originally from Canada and spent several years living in Germany. Based on her experience with the L2, she was able to map numerous stages of identity development, which included, for example, the adoption of alternative L2 accents to avoid being perceived as an English native speaker, as well as a variety of dialectal forms so that she could pass as a native speaker of German. Marx reported to have consciously made an effort to change her pronunciation and come up with a new identity in her L2.

Nagle (2022) indicates that, in addition to L2 identity issues, socio-affective factors have been linked to the development of L2 pronunciation. A group of Japanese learners of English (L2) was investigated by Saito, Dwaele and Hanzawa (2017) in terms of the connection between various types of motivation (e.g., integrativeness, cultural orientation, professional advancement), metacognitive orientation (e.g., accurate grammar and vocabulary and native-like pronunciation), and comprehensibility and accentedness gains throughout one semester. The results demonstrated that students who showed specific motivation profiles significantly enhanced their comprehensibility (but not accentedness) as they were motivated to study English as a preparation for their long-term future career development without having any specific integrative (e.g., speech community) or instrumental (e.g., workplace) predilection. Regarding language learning orientation, the participants generally prioritized the improvement of comprehensibility and lexicogrammar, rather than native-like pronunciation.

As far as we have observed, quantitative approaches have been a trend when it comes to identity and the development of L2 pronunciation. This tendency is unquestionably valid since it enables researchers to compare effects taking into account diverse learning contexts at different learning stages. However, as Moyer (2017) claims, studies that are exclusively quantitative

run the risk of depicting learners as a pack of variables rather than as active performers who display choices that impact their L2 pronunciation. Mixed-methods and/or qualitative approaches, though, are extremely important to shed light on how individual differences come together and interact and on how L2 learners engage in the pronunciation learning process (NAGLE, 2022).

The overall body of research on speech perception and production under social orientation has deepened our knowledge in reference to the complex relationships between language and society. Again, the primary focus on social grounds, as expected, tends to limit the extent to which we can connect these so-called extralinguistic variables to psychological processes that operate during speech perception and production. Would there be a conciliatory direction for such a conundrum?

### 3 New routes: dynamics as a conciliatory paradigm in psycholinguistics

Psycholinguistics and sociolinguistics can benefit from each other to shed light on the development of speech sciences in several ways. By examining the interplay between language processing and social context, psycholinguistics may help to uncover the cognitive processes that underlie speech perception and production as sociolinguistics can provide insights into how social context affects language use. The combination of these perspectives may lead researchers to better understand how cognitive and social factors interact to shape our use and understanding of language.

Psycholinguistic research has traditionally focused on monolingual speakers, but the area has devoted great attention to bilingual and multilingual speakers since the last decades. This way, sociolinguistics can help to provide insights into the social and cultural factors that influence language acquisition and use in multilingual communities, while psycholinguistics can help to uncover the cognitive processes that underlie language learning guided by social variables.

In the previous section, we made an effort to stress the relationship between some properties of social indexicality that tend to be neglected by mainstream psycholinguistic studies, such as language attitude, identity, socioeconomic status, cultural orientation, to name a few, and the development of L2 speech perception and production. It must be clear that those factors are key to any comprehensive analysis that turns to psychological processes underlying L2 learning, but the ways in which these social variables shape speech perception and production are still not fully understood. Hence our claim for the congregation of psychologically and socially oriented approaches to the study of L2 speech development: psycholinguistics may help to uncover the cognitive mechanisms that underlie linguistic knowledge inasmuch as sociolinguistics can provide insights into the social factors that give rise to the linguistic outcome of social indexicality.

As stated earlier, and as Brazilian psycholinguists may have already noticed, most studies on L2 speech development do not aim at combining cognition and social indexicality. One of the reasons for this scenario is that, according to Albano (2020, p. 14), "we are so immersed in the idea that meaning is a mental phenomenon that we ignore the possibility that it is built from the outside in". Moreover, few theoretical models can integrate the cognitive and social aspects of learning. In this sense, we advocate the Complex Dynamic Systems Theory (CDST) as a theoretical paradigm capable of combining psycholinguistics and sociolinguistics, since in this perspective languages emerge from the interrelated patterns of experience, social interaction and cognitive mechanisms and processes (BECKNER *et al.*, 2009).

Regarding L2 speech development, usage-based models, according to Larsen-Freeman (2013), provide CDST with a route. This paradigm (e.g., BYBEE, 2001) supports the idea that individuals learn speech categories by engaging in organic communication through interpersonal and cognitive processes (SLOBIN, 1977). To Beckner *et al.* (2009), development is therefore a complex and

probabilistic analysis of language samples available in the ecology of communication. Learning thus involves the estimate of the norms of a given speech community, through limited samples derived from the experiences perceived by one's cognitive machinery, psychomotor capacities, as well as by the dynamics of social interaction itself. And that also applies to L2 speech development.

According to CDST, language learning (either native or non-native) is not a linear process with clear stages, but rather a dynamic, non-linear course in which multiple factors interact and influence each other over time. A bird's eye view of the theory (ADAMI, 2002; LARSEN-FREEMAN; CAMERON, 2008; CHEN; BAK, 1991; CILLIERS, 1998; HOLLAND, 1995, 2006; KAUFFMAN, 1995; LEWIN, 1993; NICOLIS; PRIGOGINE, 1989) enables us to establish that:

I. Language learning is an emergent process: the ability to use language emerges from the interaction of various factors over time. These factors can include the learner's cognitive abilities, social interactions, and environmental inputs, and their interaction is what gives rise to the development of language.

II. Language learning is a self-organizing process: the learner's linguistic system is not predetermined but rather self-organizes based on their interaction with the environment. This means that the system adapts and reorganizes itself over time as the learner receives input and feedback.

III. Language learning is a non-linear process: language learning is not a linear, step-by-step process, but rather a dynamic course that involves constant change and adaptation. Learners often experience periods of rapid progress followed by plateaux or periods of regression, which are all part of the complex and non-linear nature of the learning process.

IV. Language learning is influenced by multiple factors: as we have mentioned, language learning is influenced by a range of factors, including the lear-

ner's cognitive abilities, social context, environmental input, and motivation. These factors interact with each other in complex ways, and their relative importance can vary over time.

To highlight how social variables may be captured within the CDST framework, which can certainly be traced towards its correlates in the field of psycholinguistics, it is worth mentioning the influence of the social context on the dynamics of verbal interaction. For example, the presence of a certain interlocutor can affect the way people speak and express themselves, and that interlocutor's response can, in turn, impact behaviors mobilized in the conversation. On this note, the only apparent speech stability – especially on short time scales – of a speaker is associated with the notion of attractor state (KUPSKE; LIMA JR., 2022), which, to Newman (2009), is a critical value, standard, solution or result towards which a system approaches over time (NEWMAN, 2009).

As already pointed out, since individuals see language as a pivotal component of participation in social and cultural groups (and that also applies to the L2), new life paths and/or new social contexts and interlocutors can create other states of attraction, making speech production and perception fluctuate in their directions. In this view, social indexicality, from the CDST point of view, also guides language development and stability, since it plays a central role in the process of linguistic accommodation, that is, in the process of alignment with certain interlocutors and social groups. Social factors therefore create contexts of attraction that might lead to a phonetic-phonological adjustment in the L2. They should also be as important as purely linguistic and cognitive variables, provided that they are crucial to speech perception and production.

When applied to linguistic analysis, CDST has great potential to dig into language practices in social groups. Actually, CDST turns out to be a fruitful route for us to understand how language is used to construct social identities and how social norms affect the way people communicate and the variants they put into practice. Along the same

lines, we should point up the relationships inherent to linguistic change in social contexts, which involve the role of social and cultural factors in the propagation of linguistic variation and change and linguistic diversity in different communities (KUPSKE; PEROZZO; ALVES, 2019).

In the end, the development of L2 speech perception and production is itself a complex, dynamic process that emerges from the interaction of countless factors over time. By pondering this necessary link between psychological and indexical variables, we inevitably must accept that what isolated research has done so far corresponds just to the tip of the L2 speech iceberg.

### Final remarks

Psycholinguistics has long been concerned with understanding the way in which linguistic knowledge is acquired, represented, and used in the mind and brain. In recent years, researchers have increasingly recognized the role that social variables play in shaping these processes. In the context of L2 speech development, as shown in this article, social variables are particularly important, as they can influence the pace and trajectory of L2 acquisition. As Henrich, Heine and Norenzayan (2010) highlight, acknowledging the complete range of human diversity does not entail abandoning the pursuit of comprehending human nature, or, in the case of this article, L2 speech development. Instead, such acknowledgement sheds light on an exploration of human nature that is even more complex, interesting, and significant.

As pointed out by Mougeon, Rehner and Nadasdi (2004), trying to anticipate the outcome of variable L2 target input in the speech perception and production of individuals is a challenge. For example, not all identities and/or social indexes attract the same amount of attention in social practices, and the attention devoted to certain indexes may vary according to the speaker's origins and L1. Cultural differences can impact L2 speech development, as individuals from different cultural backgrounds may have different linguistic experiences and exposure to different

languages and values. While bilinguals might be competent L2 users, they might not be yet competent in understanding the semiotic landscape realized by the L2. In order to navigate properly with the L2, bilinguals must develop awareness of (i) the variants and their frequencies; (ii) the independent linguistic and non-linguistic factors constraining those variants; (iii) the ordering of specific constraints in those factors; and also (iv) the stances, acts, activities, and styles that index gender (MEYERHOFF; SCHLEEF, 2012).

There is therefore a lot psycholinguistics can learn from sociolinguistics. In this sense, this review article aimed at popularizing and drawing attention to this possible and important interface between psycholinguistics and sociolinguistics regarding L2 speech development. We believe that, by working collectively, researchers can uncover the cognitive and social factors that shape language use and understanding, and develop more nuanced theories of how language is structured and operates.

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### References

- ADAMI, Christoph. What is complexity? *Bioessays*, Medford, v. 24, n. 12, p. 1085-1094, 2002.
- ALBANO, Eleonora C. *O gesto auditivo: fonologia como pragmática*. São Paulo: Cortez, 2020.
- ALBANO, Eleonora C. *O gesto e suas bordas: esboço de fonologia acústico-articulatória do português brasileiro*. Campinas: ALB; Mercado de Letras, 2001.
- AMBADY, Nalini; SKOWRONSKI, John. *First impressions*. New York: Guilford Press, 2008.
- ASHBY, Michael; MAIDMENT, John. *Introducing phonetic science*. Cambridge: Cambridge University Press, 2005.
- BECKNER, Clay *et al.* Language is a complex adaptive system: position paper. *Language Learning*, Flagstaff, v. 59, p. 1-26, dez. 2009.

BEST, Catherine. A direct realist view of cross-language speech perception. In: STRANGE, Winifred (org.). *Speech perception and linguistic experience: issues in cross-language research*. Timonium: York Press, 1995. p. 171-204.

BEST, Catherine; TYLER, Michael. Nonnative and second-language speech perception: commonalities and complementarities. In: BOHN, Ocke-Schwen; MUNRO, Murray (org.). *Language learning & language teaching*. Amsterdam: John Benjamins Publishing Company, 2007. v. 17. p. 13-34.

BLOCK, David. *The social turn in second language acquisition*. Washington, DC: Georgetown University Press, 2003.

BOURDIEU, Pierre. *Outline of a Theory of Practice*. Cambridge: Cambridge University Press, 1977.

BULCHOLTS, Mary. From stance to style: gender interaction and indexicality in Mexican immigrant youth slang. In: JAFFE, Alexandra (ed.). *Stance: sociolinguistic perspectives*. Oxford: Oxford University Press, 2009. p. 146-170.

BYBEE, Joan. *Phonology and language use*. Cambridge: Cambridge University Press, 2001.

CHEN, Kan; BAK, Per. Self-organized criticality. *Scientific American*, New York, v. 264, n. 1, p. 26-33, 1991.

CILLIERS, Paul. *Complexity and postmodernism*. London: Routledge, 1998.

COLANTONI, Laura; STEELE, Jeffrey; ESCUDERO, Paola. *Second language speech: theory and practice*. Cambridge: Cambridge University Press, 2015.

DARVIN, Ron; NORTON, Bonny. Identity. In: LI, Shaofeng; HIVER, Phil; PAPI, Mostafa (ed.). *The Routledge Handbook of Second Language Acquisition and Individual Differences*. New York: Routledge, 2022. p. 235-250.

DILLEY, Laura; MATTYS, Sven; VINKE, Louis. Potent prosody: comparing the effects of distal prosody, proximal prosody, and semantic context on word segmentation. *Journal of Memory and Language*, Amsterdam, v. 63, n. 3, p. 274-294, 2010.

DRAGER, Katie. *Linguistic variation, identity construction and cognition*. Berlin: Language Science Press, 2015.

DRUMMOND, Rob. Aspects of identity in a second language: ING variation in the speech of Polish migrants living in Manchester, UK. *Language Variation and Change*, Cambridge, v. 24, n. 1, p. 107-133, 2012.

DUFOUR, Sophie *et al.* The perception of the French /s/-/ʃ/ contrast in early Creole-French bilinguals. *Frontiers in Psychology*, Lausanne, v. 22, n. 5, p. 1-8, 2014.

ECKERT, Penelope; RICKFORD, John. *Style and socio-linguistic variation*. Cambridge: Cambridge University Press, 2001.

ECKERT, Penelope. Variation and the indexical field. *Journal of Sociolinguistics*, Hoboken, v. 12, n. 1, p. 453-476, 2008.

ERIKSEN, Thomas. *What is anthropology?* London: Pluto Press, 2004.



ESCUADERO, Paola; BOERSMA, Paul. Bridging the gap between L2 speech perception research and phonological theory. *Studies in Second Language Acquisition*, Cambridge, v. 26, n. 4, p. 551-585, 2004.

ESCUADERO, Paola. *Linguistic perception and second language acquisition*. Utrecht: Utrecht University, 2005.

ESCUADERO, Paola. Linguistic perception of "similar" L2 sounds. In: BOERSMA, Paul; HAMMAN, Silke (org.). *Phonology in perception*. Berlin: Mouton de Gruyter, 2009. p. 151-190.

EVANS, Bronwen G.; IVERSON, Paul. Plasticity in vowel perception and production: a study of accent change in young adults. *The Journal of the Acoustical Society of America*, Melville, v. 121, n. 1, p. 3814-3826, 2007.

EVANS, Bronwen G.; IVERSON, Paul. Vowel normalization for accent: an investigation of best exemplar locations in northern and southern British English sentences. *The Journal of the Acoustical Society of America*, Melville, v. 115, n. 1, p. 352-361, jan. 2004.

FERRARO, Gary; ANDREATTA, Susan. *Cultural anthropology: an applied perspective*. Belmont: Cengage Learning, 2010.

FIGUEIREDO, Eduardo. Second language acquisition in Brazil since the social turn. *Revista Brasileira de Linguística Aplicada*, Belo Horizonte, v. 18, n. 1, p. 1-27, 2018.

FLEGE, James Emil; BOHN, Ocke-Schwen. The revised speech learning model (SLM-r). In: WAYLAND, Ratre (org.). *Second language speech learning: theoretical and empirical progress*. Cambridge: Cambridge University Press, 2021. p. 3-84.

FLEGE, James Emil. Second language speech learning: theory, findings and problems. In: STRANGE, Winifred (org.). *Speech perception and linguistic experience: issues in cross-language research*. Baltimore: York Press, 1995. p. 233-277.

FOULKES, Paul; DOCHERTY, Gerard. The social life of phonetics and phonology. *Journal of Phonetics*, Amsterdam, v. 34, p. 409-438, 2006.

FOULKES, Paul; DOCHERTY, Gerard. *Urban voices: accent studies in the British Isles*. London: Hodder Education, 1999.

GEE, James. *Social linguistics and literacies: Ideology in discourses*. London: Falmer Press, 1990.

GUMPERZ, John. *Discourse strategies*. Cambridge: Cambridge University Press, 1982.

GILEAD, Michael; LIBERMAN, Nira. Talker variability and perceived identity: investigating the cognitive processes underlying person perception. *Journal of Memory and Language*, Amsterdam, v. 101, p. 42-60, 2018.

HENRICH, Joseph; HEINE, Steven J.; NORENZAYAN, Ara. Most people are not WEIRD. *Nature*, London, v. 466, n. 7302, p. 29-29, jul. 2010.

HOLLAND, John. *Hidden order: how adaption builds complexity*. New York: Perseus Books, 1995.

HOLLAND, John. Studying complex adaptive systems. *Journal of Systems Science and Complexity*, ls. I.J., v. 19, n. 1, p. 1-8, 2006.

HOWARD, Martin. Style and (in)formality: Developing socio-stylistic variation in a second language. In: GEESLIN, Kimberly (ed.). *The Routledge Handbook of Second Language Acquisition and Sociolinguistics*. New York: Routledge, 2022. p. 152-164.

JACKSON, Carrie; O'BRIEN, Mary. The interaction between prosody and meaning in second language speech production. *Unterrichtspraxis*, ls. I.J., v. 44, n. 1, p. 1-11, 2011.

JIQUILIN-RAMIREZ, Diego *et al.* Três casos de deriva fonética intralinguística na aquisição fonológica de adultos. In: FERREIRA-GONÇALVES, Giovana; BRUM-DE-PAULA, Mirian (org.). *Dinâmica dos movimentos articulatórios: sons, gestos, imagens*. Pelotas: UFPel, 2013. p. 11-36.

KAUFFMAN, Stuart. *At home in the universe: the search for laws of complexity*. London: Viking Press, 1995.

KENT, Ray; READ, Charles. *The acoustic analysis of speech*. London: Cengage Learning, 1992.

KIM, Su; WEBB, Stuart. Individual difference factors for second language vocabulary. In: LI, Shaofeng; HIVER, Phil; PAPI, Mostafa (ed.). *The Routledge Handbook of Second Language Acquisition and Individual Differences*. New York: Routledge, 2022. p. 282-293.

KINZLER, Katherine D. Language as a Social Cue. *Annual Review of Psychology*, San Mateo, v. 72, n. 1, p. 241-264, 2021.

KOTTAK, Conrad. *Anthropology: appreciating human diversity*. New York: McGraw Hill, 2011.

KUNDA, Ziva. *Social cognition: making sense of people*. Cambridge: MIT Press, 1999.

KUPSKE, Felipe F. *Imigração, Atrito e Complexidade: A Produção das Oclusivas Surdas Iniciais do Inglês e do Português por Sul-Brasileiros Residentes em Londres*. Tese (Doutorado em Letras)- Programa de Pós-Graduação em Letras, Instituto de Letras, Universidade Federal do Rio Grande do Sul, Porto Alegre, 2016.

KUPSKE, Felipe F. A complex approach on integrated late bilinguals' English VOT production: a study on South Brazilian immigrants in London. *Ilha do Desterro*, Florianópolis, v. 70, n. 3, p. 81-93, 2017.

KUPSKE, Felipe F. Atrito linguístico. In: KUPSKE, Felipe F.; ALVES, Ubiratã K.; LIMA JR., Ronaldo (org.). *Investigando os sons de línguas não nativas: uma introdução*. Campinas: Abralín, 2021a. v. 1. p. 99-128.

KUPSKE, Felipe F. Destabilizing effects of L2 explicit pronunciation instruction on L1 speech: voice onset time production by Brazilian intermediate users of English. *Gradus: Revista Brasileira de Fonologia de Laboratório*, Porto Alegre, v. 6, n. 2, p. 32-49, 2021b.

KUPSKE, Felipe F.; LIMA JR., Ronaldo. Integração a contextos de L2 dominantes e adaptabilidade fonológica de L1: uma análise da produção das plosivas surdas do português brasileiro. *Organon*, São Paulo, v. 37, p. 173-198, 2022.



- KUPSKE, Felipe F.; PEROZZO, Reiner V.; ALVES, Ubiratã K. Sound change as a complex dynamic phenomenon and the blurriness of grammar stability. *Macabéa: Revista Eletrônica do Netlli, Crato*, v. 8, n. 2, p. 158-172, 2019.
- KUPSKE, Felipe F. The impact of language attrition on language teaching: the dynamics of linguistic knowledge retention and maintenance in multilingualism. *Ilha do Desterro, Florianópolis*, v. 72, n. 3, p. 311-329, 2019.
- LADEFOGED, Peter. *A course in phonetics*. Boston: Heinle & Heinle, 2001.
- LARSEN-FREEMAN, Diane; CAMERON, Lynne. *Complex systems and applied linguistics*. Oxford: Oxford University Press, 2008.
- LARSEN-FREEMAN, Diane. Complexity theory: a new way to think. *Revista Brasileira de Linguística Aplicada, Belo Horizonte*, v. 13, n. 2, p. 363-373, 2013.
- LEWIN, Roger. *Complexity: life on the edge of chaos*. London: Phoenix, 1993.
- LISKER, Leigh; ABRAMSON, Arthur. A cross-language study of voicing in initial stops: acoustical measurements. *Word, New York*, v. 20, n. 3, p. 384-422, 1964.
- MARCONI, Marina; PRESOTTO, Zelia. *Antropologia: uma introdução*. São Paulo: Atlas, 2022.
- MARX, Nicole. Never quite a native speaker: Accent and identity in the L2 and the L1. *Canadian Modern Language Review: La Revue Canadienne des Langues Vivantes, Is.II*, v. 59, p. 264-281, 2002.
- MCGURK, Harry; MACDONALD, John. Hearing lips and seeing voices. *Nature, London*, v. 264, p. 746-748, 1976.
- MENNEN, Ineke; DE LEEUW, Esther. Beyond segments: prosody in SLA. *Studies in Second Language Acquisition, Cambridge*, v. 36, p. 183-194, 2014.
- MEYERHOFF, Miriam; SCHLEEF, Erick. Variation, contact and social indexicality in the acquisition of (ing) by teenage migrants. *Journal of Sociolinguistics, Hoboken*, v. 16, n. 3, p. 398-416, 2012.
- MILES, Lynden; LUMSDEN, Joanne; RICHARDSON, Michael; MACRAE, Neil. Do birds of a feather move together? Group membership and behavioural synchrony. *Experimental Brain Research, Is.II*, v. 211, p. 495-503, 2011.
- MOUGEON, Raymond; REHNER, Ketherine; NADASDI, Terry. The learning of spoken French variation by immersion students from Toronto, Canada. *Journal of Sociolinguistics, Hoboken*, v. 8, n. 3, p. 408-432, 2004.
- MOYER, Alene. *Autonomy in second language phonology: Choice vs. limits. Language Teaching, Is.II*, v. 50, p. 395-411, 2017.
- NAGLE, Charles. Individual difference factors for second language pronunciation. In: LI, Shaofeng; HIVER, Phil; PAPI, Mostafa (org.). *The Routledge handbook of second language acquisition and individual differences*. New York: Routledge, 2022. p. 269-281.
- NEWMAN, Lenore Lauri. Human-environment interactions, complex systems approaches for dynamic sustainable development. *Encyclopedia of complexity and systems science*. New York: Springer New York, 2009. p. 4631-4643.
- NICOLIS, Grégoire; PRIGOGINE, Ilya. *Exploring complexity*. New York: Freeman and Co. Publishing, 1989.
- OCHS, Elinor. Indexing gender. In: DURANTI, Alessandro; GOODWIN, Charles (ed.). *Rethinking context: language as an interactive phenomenon*. Cambridge: Cambridge University Press, 1992. p. 335-358.
- PEROZZO, Reiner V.; KUPSKE, Felipe F. Speech perception and production as constructs of action: implications for models of L2 development. *Revista X, Curitiba*, v. 16, n. 5, p. 1231-1257, 2021.
- PEROZZO, Reiner V. Percepção dos sons. In: KUPSKE, Felipe F.; ALVES, Ubiratã K.; LIMA JR., Ronaldo (org.). *Investigando os sons de línguas não nativas: uma introdução*. Campinas: Abralim, 2021. v. 1. p. 69-98.
- PRESTON, Dennis; NIEDZIELSKI, Nancy. *A reader in sociophonetics*. London: De Gruyter Mouton, 2010.
- RINGER-HILFINGER, Kathryn. Learner acquisition of dialect variation in a study abroad context: the case of the Spanish I. *Foreign Language Annals, Medford*, v. 45, n. 3, p. 1-17, 2012.
- SAITO, Kazuya; DWAELE, Jean-Marc; HANZAWA, Keiko. A longitudinal investigation of the relationship between motivation and late second language speech learning in classroom settings. *Language and Speech, Thousand Oaks*, v. 60, n. 4, p. 614-632, 2017.
- SCHMID, Monika; DUSSELDORP, Elise. Quantitative analyses in a multivariate study of language attrition: the impact of extralinguistic factors. *Second Language Research, Thousand Oaks*, v. 26, n. 1, p. 125-160, 2010.
- SCHMID, Monika. *First language attrition, use and maintenance: the case of German Jews in anglophone countries*. Amsterdam: John Benjamins, 2002.
- SCHMID, Monika. Languages at play: the relevance of L1 attrition to the study of bilingualism. *Bilingualism: Language and Cognition, Cambridge*, v. 13, n. 1, p. 1-7, 2010.
- SCHMIDT, Lauren; LINFORD, Bret; FAFULAS, Stephen. Regional variation. In: GEESLIN, Kimberly (org.). *The Routledge handbook of second language acquisition and sociolinguistics*. New York: Routledge, 2022. p. 126-137.
- SCHOONMAKER-GATES, Elena. Socially driven second language pronunciation. In: GEESLIN, Kimberly (ed.). *The Routledge Handbook of Second Language Acquisition and Sociolinguistics*. New York: Routledge, 2022. p. 165-173.
- SILVERSTEIN, Michael. Indexical order and the dialectics of sociolinguistic life. *Language and Communication, Is. I*, v. 23, n. 1, p. 193-229, 2003.
- SILVERSTEIN, Michael. Shifters, linguistic categories, and cultural description. In: BASSO, Keith; SELBY, Henry (ed.). *Meaning in Anthropology*. Albuquerque: University of New Mexico Press, 1976. p. 11-55.

SINGLETON, David; PFENNINGER, Simone. Age. In: LI, Shaofeng; HIVER, Phil; PAPI, Mostafa (ed.). *The Routledge Handbook of Second Language Acquisition and Individual Differences*. New York: Routledge, 2022. p. 251-265.

SLOBIN, Dan. Language change in childhood and in history. In: MACNAMARA, John (ed.). *Language learning and thought*. London: Academic Press, 1977.

SUZUKI, Yuichi. Individual difference factors for second language grammar. In: LI, Shaofeng; HIVER, Phil; PAPI, Mostafa (ed.). *The Routledge Handbook of Second Language Acquisition and Individual Differences*. New York: Routledge, 2022. p. 294-309.

TRIMBLE, John. Perceiving intonational cues in a foreign language: perception of sentence type in two dialects of Spanish. In: SIMPÓSIO DE LINGUÍSTICA HISPÂNICA, 15., 2013, SOMERVILLE. *Anais [...] Somerville: Cascadilla Proceedings Project, 2013*.

WELLS, J. C. *Accents of English*. Cambridge: Cambridge University Press, 1982.

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