

## Editorial

# The Effects of Cross-Language Differences on Bilingual Production and/or Perception of Sentence-Level Intonation

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## 1. Overview

We put together this Special Issue with the goal of collecting state-of-the-art articles on the intonational patterns of different types of bilinguals, with a particular focus on understudied language pairings, and we believe that we have succeeded. The ten articles included here encompass a wide variety of languages (e.g., Arabic, German, Bulgarian, Inuktitut, English, Spanish, French, Norwegian, Czech, Italian, and Japanese) and bilingual contexts (e.g., Heritage Speakers, L2 learners, societal bilingualism).

The contributions of this issue, however, are not merely empirical. Several papers (Andreeva and Dimitrova, Granget and Delais-Roussarie, Kim, Mennen et al., Pešková) set out to test whether models, such as Mennen's (2015) LILt model or the prosodic transfer hypothesis (Goad and White 2004), could predict which aspects of intonation are more prone to cross-linguistic prosodic influence or which L1 prosodic structures interact with L2 morphology. Independently of the theoretical model used, all of the papers have contributed to bringing us a step closer to finding answers to the specific questions we proposed, such as: *Can we determine a hierarchy of difficulty or transferability? How does prosody interact with other components of the grammar, such as morphology or syntax, in a contact situation? Which aspects are more prone to bidirectional interference? Which changes in intonation make speakers sound foreign in their second (or first) language?* We will briefly discuss here how these questions were addressed, but we will first summarize the structures analyzed in the volume, the types of bilingual contexts, the specific language pairings studies, and the methodologies employed.

### 1.1. Structures Analyzed in This Special Issue

The papers included in this volume cover a rich variety of sentence types and prosodic structures. Several papers study broad focus declaratives exclusively (e.g., Hellmuth, Kelly, Andreeva and Dimitrova, Kim), while others simultaneously analyze a range of sentence types, including non-neutral statements (Pešková) or broad-focus declaratives compared to different types of canonical and non-canonical interrogatives (Colantoni et al., Mennen et al.).

A subset of contributions focuses on the prosody of specific syntactic structures, such as vocative calls (Hamlaoui et al.), yes-no questions (Dahmen et al.), or the type of inflection chosen in the expression of subject-verb agreement by L2 speakers (Granget and Delais-Roussarie). The range of syntactic structures analyzed is mirrored by the variety of prosodic structures. The contributions included here analyze the type (e.g., Kelly, Pešková) and realization (Colantoni et al., Dahmen et al., Hellmuth, Mennen et al.) of pitch accents and nuclear contours and/or the tune associated with a given structure, such as the vocative chant (Hamlaoui et al.). They also investigated the relative difficulty of acquiring prosody vs. segments (Kelly, Dahmen et al.) and the role that L1 prosodic structure may play in the acquisition of L2 morphology (Granget and Delais-Roussarie). This is indeed an impressive



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range of syntactic and prosodic structures, which, as we will discuss in Section 2, allows us to further our understanding of bilingual prosody.

### 1.2. Types of Bilingual Contexts

The present Special Issue illustrates bilingual situations that vary along different axes, such as the age of onset of acquisition of each language and the typological diversity between the languages or varieties in contact. Some of the studies focused on early bilinguals (Colantoni et al., Hamlaoui et al., Kim) who were exposed to both languages at home or in school in a context of societal bilingualism. Others analyzed cases of adult L2 learning (Granget and Delais-Roussarie; Pešková, Dahmen et al.), including instances of speakers who lived in a L2 context for a prolonged time (Kelly; Mennen et al.). As such, the whole spectrum of proficiencies is reflected in these studies, from the A2 to the C2 level, as described by the CEFR (Common European Framework of Reference).

As concerns typological distance, studies range from looking at typologically close languages (e.g., two intonational languages, such as L1 English–L2 German) or prosodically and phylogenetically unrelated languages (e.g., Basaá–French in Hamlaoui et al.; Inuktitut–English in Colantoni et al.). A special case within this group is the study of two varieties of Arabic (Hellmuth), such as a local variety (Yemeni Arabic) and Modern Standard Arabic, which are in a diglossic relation. Both the variety of bilingual contexts and the inclusion of prosodically diverse languages will allow researchers to start painting a picture of how duration and intensity of contact interact with prosodic typology in predicting patterns of cross-linguistic influence.

### 1.3. Language Pairings

One of the goals of the present issue was to broadcast research on understudied language pairings, and we were impressed with the range of contributions received. Even the study that focused on a relatively well-studied pairing (i.e., Kim; English–Spanish) looked at a population (heritage speakers) and a structure (uptalk) that have not been previously explored. This study nicely fits within a group of papers that explored the contact between two intonational languages, such as L1 English–L2 German (Mennen et al.), L1 Bulgarian–L2 German (Andreeva and Dimitrova), L1 Italian–L2 German (Dahmen et al.), L1 Czech–L2 Italian or Spanish (Pešková), and the interaction between local and standard varieties of Arabic (Hellmuth).

Another group of studies focused on speakers whose L1 is a tonal language and who are acquiring an intonational language. Within this group, Kelly analyzed the acquisition of English pitch accents by a L1 Norwegian speaker, comparing two moments in time. Hamlaoui et al. investigated the realization of vocative contours in L2 speakers of Cameroonian French whose L1 is Basaá, which is a language with H and L tones, plus toneless moras.

Granget and Delais-Roussarie analyzed the possibility of prosodic transfer in the realization of verbal morphology in L2 French by comparing speakers of a mora-timed language (i.e., L1 Japanese) with those of a stress-timed language (i.e., German). The final study (Colantoni et al.) looked at the contact between English and Inuktitut, a language that has been described as having no lexical stress and where intonation is used as a cue for phrasing.

### 1.4. Variety of Methods

We also want to point out the variety of methods exemplified in this Special Issue. Although there is not a balance between studies focusing on perception vs. production (i.e., only one study analyzes both; Colantoni et al.), the production studies encompass a variety of participants, tasks, and data analysis techniques. Studies range from an in-depth analysis of the prosody of one participant, both across multiple interviews (Hellmuth) or at different points in time (Kelly), to a study with 52 participants (Pešková). Most of the studies include 20–30 participants.

The papers included in this Special Issue vary in the selection of tasks. A couple of studies incorporate the analysis of semi-spontaneous tasks, such as narratives (Granget and Delais-Roussarie; Kelly), sociolinguistic interviews (Hellmuth), or dialogues (Kim). A frequent task used to elicit naturalistic data is the Discourse Completion Task (Colantoni et al.; Hamlaoui et al.; Pešková). Reading tasks (Mennen et al.) and elicited imitation (Colantoni et al.) were also discussed.

In addition to the phonological analysis of pitch accents and boundary tones, studies include detailed analyses of local or global  $f_0$  excursions (e.g., Colantoni et al.; Dahmen et al., Hellmuth, Kelly, Mennen et al.),  $f_0$  changes (e.g., Kim, Colantoni et al., Kelly), pitch dynamism quotient (Kelly), and alignment of the start and/or end of rises (Andreeva and Dimitrova; Mennen et al.). Duration (Andreeva and Dimitrova, Hamlaoui et al., Kim), intensity (Hamlaoui et al.), and final laryngealization (Hellmuth) are also analyzed.

## 2. Finding Answers to Our Questions

The first question we sought to answer was whether it would be possible to determine a *hierarchy of difficulty or transferability*, and the papers included here provide novel and complementary answers. Some studies have expanded the scope of our question by looking at the relative difficulty of acquiring intonation vs. other components of the grammar. Kelly, for example, investigates whether the L1 Norwegian speaker that she analyzes would show a greater degree of cross-linguistic influence in the frequency and realization of pitch accents or in the voicing of /z/, and her results show that the speaker is closer to the L2 target in the segmental than in the prosodic realization. Colantoni et al. explore whether context would have an impact in the selection of the appropriate syntactic and prosodic structure by looking at the English production of L1 Inuktitut speakers. They find that participants have difficulty in the syntax–pragmatic interface (i.e., producing the type of question that is appropriate to the context) and in incorporating tonal movement in the prenuclear region, as indicated by the absence of tonal movement. The prenuclear region is clearly an area of difficulty for these bilinguals, and this is also the case for perception. Whereas rising boundary tones are systematically interpreted as a cue for question, a falling boundary tone is not categorically associated with statements, probably due to the significant tonal movement in the English prenuclear region. The most systematic answer to this question, though, comes from the papers that have tested the adequacy of Mennen’s (2015) LILt model. These show that a systematic analysis of the four dimensions (semantic, frequency, systemic, and realizational) allows us to answer where transfer will or will not occur. Realizational differences are reported in all the studies that have applied this framework (Mennen et al., Andreeva and Dimitrova, Kim; Pešková). Interestingly, Mennen et al. show that realizational differences come in many flavors, and in their data set, for example, alignment, rather than pitch range, turned out to be significant. Pešková, in a finding that resembles the one reported by Colantoni et al., observes that realization interacts with position, since her participants were more target-like with boundary tones than with pre-nuclear pitch accents. Differences in the frequency dimension were observed in two papers (Mennen et al., Andreeva and Dimitrova). Two papers document deviances in the semantic dimension, either by showing that bilinguals differ from monolinguals of each language (Mennen et al.) or by arguing that bilinguals have a reduced inventory because they are not exposed to melodies that are used in informal contexts by monolinguals (Hamlaoui et al.). Finally, systemic differences were found in just one study (Mennen et al.), which interestingly showed that all bilinguals transferred a pitch accent, which is absent in English but is frequently used in Austrian German, to their L1.

As mentioned, the question of the hierarchy of difficulty is intertwined with our second question, which concerns the *interaction between prosody and other components of the grammar*. We have discussed how context interacts with prosody and syntax in the selection of question types in the speech of L1 Inuktitut–L2 English bilinguals. Bilinguals overextended the use of do-support or inversion to mark questions to contexts in which declarative questions are expected (i.e., questions that are identical to statements in word

order, but which differ in prosody). If we follow the argument in Hamlaoui et al., who also study the role of context in the selection of a specific vocative contour, we could argue that frequency also plays a role here. Indeed, Hamloui et al. show that the vocative chant that is frequently used in Metropolitan French is absent in Cameroonian French. They explain this absence by arguing that the vocative chant only appears in informal context, and Cameroonian French speakers are rarely exposed to contexts in which this chant is appropriate. In the same vein, we could argue that L1 Inuktitut speakers are less exposed to contexts that require the use of declarative questions.

One of the papers in this Special Issue specifically investigates the interaction between prosody and morphosyntax in the acquisition of the French verbal morphology (Granget and Delais-Roussarie). The authors tested the prosodic transfer hypothesis, which states that L1 prosodic structures interact with L2 morphology in the acquisition process (Goad and White 2004). To achieve this goal, they compared the marking of verb–subject agreement in narratives by speakers whose L1 is Japanese (mora-timed language) with L1 German speakers (stress-timed language). If L2 morphosyntax is guided by the L1 prosodic template, then the insertion of syllables would be more likely found in the speech of L1 Japanese speakers when compared to speakers whose L1 is German. This is indeed what they found, since L1 Japanese speakers tended to insert what they called ‘dummy auxiliaries’ into their L2, consisting of a vowel (e.g., /a, e/) or a whole syllable (e.g., /so/).

A third question concerned the prosodic aspects that are more prone to *bidirectional interference*. Mennen et al. explicitly addressed this question and showed that, not only the L2, but also the L1 prosody, is affected in the speech of adult L2 learners who have lived for many years in the context where the L2 is spoken. Indeed, they observed signs of L2-induced influences on bilinguals’ L1 speech in the systemic, frequency, and semantic dimensions and also in some aspects of the realizational dimension. Although not specifically set to test the hypothesis of bidirectionality, Hellmuth observes a high degree of mixing between the three registers of Arabic studied. In particular, all registers shared the frequency of density of phrasing boundaries. She also found that there are prosodic aspects that are under the control of the speaker, such as features of the low variety, which are suppressed when speaking the high variety. This, in turn, can be interpreted as a sign of bidirectional mixing. Finally, Kim raises the question of whether the uptalk patterns observed in the speech of Spanish–English bilinguals are the result of bidirectional interference. This seems to be the case for some of the speakers. In most cases, however, heritage Spanish speakers can keep the two types of rises in declaratives (short rise for Spanish vs. long rise for English) apart.

Our last question concerned the extent to which changes in intonation make speakers sound foreign. While none of the contributions to this Special Issue tackled this question directly, a few papers investigated which aspects in the speech of bilinguals differentiate them the most from monolingual speakers. Andreeva and Dimitrova, for instance, concluded that L1 influence was more obvious in the frequency dimension than in other dimensions, and this was particularly the case for those L1 Bulgarian–L2 German speakers who were exposed to the L2 later in life. Mennen et al. showed that the extent of L2 influence on L1 intonation was most extensive in the systemic dimension of L1 English–L2 Austrian German speakers immersed in a L2-speaking environment. Finally, two papers (Dahmen et al., Kelly) examined whether L2 experience or training improved the relative extent of bilinguals’ deviances in intonation or segments. Kelly, in a longitudinal study of a L1 Norwegian speaker who moved to England, found that segment realization improved more over time than the realization of pitch accents. Dahmen et al. showed, in Italians learning German, that segment-oriented training improved the learners’ production of segments, and prosody-oriented training improved their production of prosody. However, prosody training was found to also be beneficial for the production of segments, whereas no positive effects on prosody were found for segmental training.

### 3. Contributions and Future Studies

The papers offer comprehensive and new answers to the questions proposed, and open multiple avenues for new research, of which we have identified a few. First, a clear picture that emerges from this volume is the valuable contribution of the LILt model (Mennen 2015) to systematize and move forward the research on the role of cross-linguistic influence in prosody. The application of the model, which adopts from L2 speech acquisition models variables, such as positional variability, highlighted the need for more research on the interaction between position in the prosodic phrase and cross-linguistic influence on the realization of pitch events. As Pešková showed, L2 speakers were more successful at matching the target in the realization of boundary tones than of pitch accents. This was consistent with Colantoni et al.'s finding that very little tonal movement was found in the realization of pre-nuclear accents. As Pešková argues, the role of perceptual saliency needs to be highlighted to account for these findings. This takes us to our second point: in general, more evidence from perception is needed both to support this claim and to align the research on bilingual intonation with L2 speech acquisition models (e.g., Best and Tyler 2007; Flege 1995; Flege and Bohn 2021). A third aspect that requires more attention, and which is characteristic of bilingual studies more generally, is the wide range of individual variability. Kim especially addresses this issue by showing how participants vary in rise duration and in IP-final deaccenting. Colantoni et al. also highlight the variability observed in perceptual accuracy and in sentence type selection. Both studies come to identical conclusions: language experience (at least in the way in which it was quantified in each of these studies) cannot always account for the patterns observed. Finally, several of the papers included here remind us of the importance of looking at the interaction between prosody and other components of grammar. This is a point that has theoretical (see Feldhausen et al. 2021) and pedagogical implications, since research is starting to show how instruction and training focused on prosody can facilitate the learning of other aspects, such as segmental accuracy (as shown in Dahmen et al., but see also Li et al. 2022).

Research on intonation and bilingualism is still in its infancy (Trouvain and Braun 2020). We hope that this Special Issue, together with other Special Issues (Mennen and de Leeuw 2014; Rao forthcoming; Face and Armstrong forthcoming) and volumes (Delais-Roussarie et al. 2015), continue to inspire future studies.

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