3.1   About project A7

3.1.1   Title: Cross-linguistic interactions in second language prosody

3.1.2   Research areas

104-01 Allgemeine und Angewandte Sprachwissenschaften, phonology, phonetics, intonation, second language, language contact

3.1.3   Principal investigator(s)

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Do the above mentioned persons hold non-permanent positions? no

3.1.4   Legal issues

This project includes

1.	research on human subjects or human material.	yes
	A copy of the required approval of the responsible ethics committee is included with the proposal.	yes[1]
2.	clinical studies.	no
3.	experiments involving vertebrates.	no
4.	experiments involving recombinant DNA.	no
5.	research involving human embryonic stem cells.	no
6.	research concerning the Convention on Biological Diversity.	no

3.2   Summary

The project aims at contributing to our understanding of L2 prosody by investigating the production and perception of intonation for information structuring in two L2 varieties of English. The varieties under consideration are L2 English with German as L1 and Black South African English (thus, with one of the South African Bantu languages as L1).

On the one hand, the project has the descriptive goal of providing empirical data on prosody used for information structuring, contributing both to language-specific description as well as to cross-linguistic comparison. Cross-linguistic comparison is ensured by following a comparable methodological protocol in data elicitation and analysis in the varieties under investigation.

On the other hand, the project aims at modelling intonational production and processing in L2 prosody. The starting point is the recent claim that there are similarities in segmental and suprasegmental learning (Trofimovich & Baker 2006), an extension of the Speech Learning Model (SLM; Flege 1995). A basic tenet of the SLM is that new category formation, and thus ultimate attainment, is easier between phonological systems that are different than between systems that are similar. Individual studies suggest, though, that this is not the case for intonation related to information structuring. Hence, the first theoretical goal of the project is to test systematically if the SLM also holds for prosody related to information structure.

Second, a model of L2 prosody will be developed, which takes phonological differences in prosodic systems into consideration. Therefore, two L2 varieties of English have been chosen in which the respective L1s have different prosodic systems: the German prosodic system is similar to English with word stress, pitch accents, deaccentuation and boundary tones, whereas South African Bantu languages have a dissimilar prosodic system with lexical and grammatical tone and only boundary tones.

3.3   Research rationale

3.3.1   Current state of understanding and preliminary work

3.3.1.1   A model of intonational processing

In speech production, the output of the syntactic component is not fully specified with respect to sentence prosody, i.e. the systematic variations in pitch, duration, pauses and/or intensity that signal linguistic meaning. Prosody receives full specification through local context (e.g. the location of word stress(es) or tones, syntax) and global context (e.g. discourse, information structure). Languages differ in their

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[1]This document is included in the appendix of the main proposal.

algorithms for the specification of sentence prosody and hence in their prosodies. The project pursues a generative approach to sentence prosody and adopts the autosegmental-metrical theory of intonation (AM-theory, e.g. Ladd 2008). It follows the pitch accent view expressed in Gussenhoven (2011), in which

1. every word has an underlying accent (where accents are seen as place markers in the phonological structure for inserting intonational tones,
2. surface accent placement is determined by various phonological postlexical (deaccenting) rules at the word- and phrase level (referring to phonological, syntactic, semantic, and information structural context),
3. semantic/pragmatic/extralinguistic context might further determine the selection of the particular accent shape from the tonal inventory of the language,
4. language-specific phonetic implementation rules determine the actual realization of pitch accent.
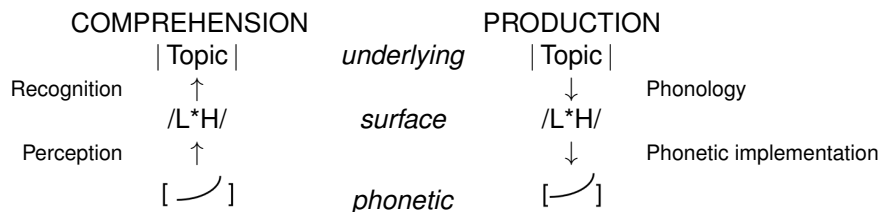
In a language like English the location of pitch accents thus also depends on discourse and is then used in order to structure the information provided in an utterance. In (1), where Mary is unambiguously established as discourse-new by the preceding question, it receives a nuclear pitch accent which results in higher pitch, higher intensity and longer duration of the primarily stressed syllable. Given information, especially post-focally, is deaccented, i.e. it is produced without pitch accents in languages like English.

(1) Who is working in the garden on Sundays?
     MARY is working in the garden on Sundays.

In English, prosodic focus marking and deaccentuation have been considered "opposite sides of the same coin" (Ladd 1980: 67). Prosodic focus marking (especially in English) has received a considerable amount of attention in the phonetics literature, with a recent meta-analysis in Breen et al. (2010).

Most studies on sentence prosody have focused on production. Although it is well-known that production and perception are closely connected (e.g. Brown 2000), Cutler (2012: 227) points out that even in the psycholinguistic literature, prosody is still "poorly integrated into models of speech processing, and cross-language comparisons of the perceptual exploitation of prosodic structure are remarkably few". A model of intonation that includes both perception and production is put forth by Féry, Kaiser, Hörnig, Weskott, & Kliegl (2009) in their psycholinguistic study of the interpretation of falling and rising accents in German, cf. (2).

(2) Model of tone processing (Féry, Kaiser, Hörnig, Weskott, & Kliegl 2009, figure 6)

	COMPREHENSION		PRODUCTION	
		Topic		*underlying*		Topic		
Recognition	↑		↓	Phonology
	/L*H/	*surface*	/L*H/	
Perception	↑		↓	Phonetic implementation
	[⌣]	*phonetic*	[⌣]	

In this model, the phonetic level refers to the acoustic signal, hence a tonal melody. The surface level represents the phonological level. In an intonation-only language like German or English, the inventory of phonological categories at this level consists of pitch accents and boundary tones. The underlying level refers to the semantic-conceptual level which is also determined by global context and thus provides labels such as topic, focus and given. The connections between the different levels, and hence the phonological and phonetic implementation as well as the perception and recognition are language-specific.

Monolingual speakers are well-equipped to apply adequate mapping algorithms given specific extra-linguistic contexts in order to decide between alternative expressions in their native language, both in production and in comprehension.

3.3.1.2 L2 prosody and the Speech Learning Model (SLM)

Whereas monolingual speakers apply the mapping algorithms adequately in their native language, multilingual speakers have (at least) two grammars and therefore two sets of language-specific mapping algorithms at their disposal. It is self-evident that there are differences between an additional language being used as a second language or a foreign language. However, adult second and foreign language use shows parallels, hence they will be considered together here. There is ample evidence that in bilingual speakers (in the widest sense of the term) grammars interact early on (e.g. for phonetic encoding and processing) and in a bidirectional fashion rather than constituting two neatly separated linguistic

systems (e.g. Mennen 2004 for prosody). Language-specific algorithms for the specification of prosody are thus difficult to acquire in an L2 (e.g. Jilka 2000, Gut 2009).

Studies of L2 prosody have investigated a number of different aspects of prosody, such as rhythm and timing (e.g. Trofimovich & Baker 2006), phonetic implementation of tunes (e.g. Mennen 2004, Atterer & Ladd 2004), placement of pitch accents (e.g. Rasier & Hiligsmann 2007), or types of boundary tones (e.g. Queen 2006). In all areas mentioned, studies show that the L1 has a decisive influence on the phonetic implementation of prosody in the L2, just as is the case in segmental phonology. In the study of L2 segmental phonology, Flege's Speech Learning Model (SLM; Flege 1995) has emerged as the most well-known model of L2 production. Its basic tenets relevant for the current discussion are (a) that a new phonetic category can be established for an L2 sound that differs phonetically from the closest L1 sound if a difference between the sounds is discernible, (b) that the greater the perceived phonetic dissimilarity between an L2 sound and the closest L1 sound, the more likely it is that differences will be discerned, and (c) that category formation for an L2 sound may be blocked by the mechanism of equivalence classification. In sum, the more similar L1 and L2 sounds are, the more unlikely it is that a target-like category will be formed. The more dissimilar sounds in L1 and L2 are, the more likely it is that a new category is formed, as their difference is discernible. The SLM thus relates to both production and perception in contrast to other models of L2 phonology which are exclusively geared at L2 perception (e.g. *Perceptual Assimilation Model* by Best 1995, or *Native Language Magnet Model* by Kuhl 1991). This makes it a suitable model for the approach taken in the current project.

It has occasionally been suggested to transfer Flege's model to the production of L2 suprasegmental aspects (Gut 2003, Trofimovich & Baker 2006). Applied to prosody it predicts that L2 speakers with a native language which is phonetically similar to the target language in its temporal and metrical patterns will show more interaction between their prosodic systems than speakers with a prosodically more distinct native language. Learners and L2 speakers with L1s that do not provide them with prosodic patterns required for the prosody of the target language will develop a new category whereas learners and L2 speakers with an L1 that is phonetically similar will produce those L1 categories (cf. Gut 2003: 136). It remains an open question if the concept of similarity is relevant at the phonetic level of implementation or at the phonological level of representation, cf. (2). Based on their own research, Trofimovich & Baker (2006) suggest that the mechanisms of suprasegmental learning also vary according to the suprasegmental aspect studied.

Trofimovich & Baker (2006) investigate the suprasegmental features speech melody (stress timing versus syllable timing) and speech fluency (speech rate, pause frequency, and pause duration) in Korean learners of English with different language experience. They tentatively suggest that only those L2 suprasegmentals that are relatively perceptually distinct from L1 suprasegmentals can be acquired successfully (i.e. being subject to experience effects), not those that are perceptually similar across learners' L1 and L2. In their study, the syllable-timing of Korean was considered to be perceptually distinct enough from the stress timing in English to be improved with increased language experience. Differences in pitch peak alignment between English and Korean, also related to speech melody, were claimed to not be easily discernible by L2 speakers and hence did would not improve with language experience. Finally, parameters related to speech fluency were considered to rely on more general psycholinguistic mechanisms of speech processing and thus not be influenced by phonetic similarity anyway.

3.3.1.3   Production and processing of intonation in L2 speakers

The project starts out from the model of intonational production and processing that has been proposed by Féry et al. (2009) for monolingual speakers and aims at developing the model further in order to make it applicable to L2 prosody. This extends the model of intonational processing to non-canonical data, understood in this project as referring to prosodic aspects in non-standard varieties. A crucial point will be to arrive at a definition of "similarity of prosody". Assuming that the underlying level i.e. the semantic-conceptual level is universal (a view shared with A6), the overall question is how language-specific mapping algorithms from the semantic-conceptual to the phonological level and from the phonetic to the phonological level are shaped in multilingual speakers. Production and perception of prosody used for information structuring will be investigated in two different L2 varieties of English, namely L2 English by speakers of German and L2 English by speakers of South African Bantu languages (e.g. Tswana). Most studies on L2 prosody investigate production and thereby provide insight into only one piece of the overall puzzle. By contrast, the project wants to investigate both production and perception in L2 prosody.

First insights into the production and perception of prosody in L2 Black South African English (BlSAfE) already exist (Zerbian 2012, 2013). They show that in production, L2 BlSAfE does not use the

same prosodic correlates (increased pitch and intensity) on focused constituents as the reference variety General South African English (GenSAfE) (Zerbian 2012). Concerning perception, speakers of BlSAfE have been shown to perceive intonational differences and be able to assign prominence, although slightly but significantly less reliably than speakers of GenSAfE (Zerbian 2013). However, there is first evidence that the functional interpretation of intonational differences as indicating focus is difficult (Zerbian 2013).

For German learners of English the current state of the art concerning the production and perception of prosody is inconclusive and even contradictory. An overuse of pitch accents has been reported for second language learners in general, including early German learners of English (Grosser 1993). Jilka (2000) found in his study of recorded interviews that German speakers produce fewer pitch accents than native speakers of (American) English (Jilka 2000: 99, 109). But because the placement of nucleus pitch accents are quite similar in English and German, he did not find pitch accent placement to produce a recognizable effect of foreign accent. At the same time, observable errors in the placement of pitch accents give "room for the assumption that non-native speakers develop a consistently simplified assignment of tonal categories, a kind of default accent" (Jilka 2000: 87). This would be in line with Klein & Perdue's (1997) "basic variety" and a corresponding reduced prosodic representation of the target language.

The two L2 varieties selected in A7 have L1s that differ in the amount of phonetic and phonological similarity of their prosodic systems to English. German, being an intonation-only language of the same language family as English, has a prosodic system which is very similar to English. The South African Bantu languages (e.g. Tswana), which are tone languages, have a prosodic system which is maximally different from English. They have been reported to show sentence-level prosody only for edge marking (boundary tones) but not for information structuring (Zerbian 2006, 2007, Swerts & Zerbian 2010). By selecting L2 varieties with L1s which crucially differ concerning the similarity of the prosodic systems, the project wants to test if Flege's SLM can be transferred to suprasegmental aspects that are influenced by information structure. Few studies have carefully varied or controlled the prosodic properties of the L1 concerning their phonetic and/or phonological similarity to the prosodic properties of the L2. Turco (forthcoming) is one study that compared the prosodic realization of verum focus in prosodically different languages, namely Romance and Germanic languages. The investigation of the acquisition of English pitch accent placement and realization by speakers of Korean and Japanese by Ueyama & Jun (1998) is an example of a study that controlled the prosodic properties of the L1 in order to examine their influence on the acquisition of English L2 intonation. Ueyama & Jun (1998) conclude that English prosody poses difficulties to the learner independent of the L1 and despite apparent phonetic similarities across the three languages concerning postfocal dephrasing. This could be interpreted as being in line with the SLM which predicts difficulties for sounds that are similar in L1 and L2.

On the other hand, both Korean and Japanese are phonologically different from English in their prosodic systems. The role of phonological representation has emerged as crucial in studies on L2 phonology. Eckman et al. (2003) address the role of allophonic variation, and hence phonological representation in the acquisition of segmental contrasts. They investigate cases in which sounds A and B contrast in the target language, while the native language has both A and B but as allophones of the same phoneme. A concrete example would be Spanish learners of English acquiring the phonemic distinction between English [d] and [ð] which is allophonic in Spanish. Acquiring this contrast in English is more difficult than acquiring a new sound. Dupoux and colleagues (e.g. Peperkamp et al. 2010) provided ample evidence for the role of phonological representation in the perception of word stress. See also Liang & van Heuven (2007) for the relevance of prosodic systems in relation to sentence mode. Concerning the processing of L2 intonation, the few existing studies show that L2 listeners have difficulties with prosodic cues to the information structure of sentences. This is true even if the L1 and L2 require parallel prosodic processing due to the phonological similarity of their prosodic systems, as in the case of Dutch listeners hearing English (Akker & Cutler 2003) or German listeners hearing Dutch (Braun & Tagliapietra 2011). Akker & Cutler (2003) found that focus and accent interact in L1 English and L1 Dutch, being two sides of the same coin, whereas for Dutch listeners hearing English both cues are needed. Braun & Tagliapietra (2011) found that a contrastive intonation contour evokes contextual alternatives in L1 Dutch whereas a non-contrastive Dutch intonation contour does not. In German, the same contour that is judged to be non-contrastive in Dutch is contrastive. German listeners hearing Dutch did not adjust their intonational processing in the L2 but interpreted the Dutch non-contrastive contour as contrastive, just like in their L1.

3.3.2 Own project-related publications

(a) **Peer-reviewed publications**

1. Zerbian, S., 2013. Prosodic marking of narrow focus across varieties of South African English. English World-Wide 34 (1), 26–47
2. Zerbian, S., 2012. Perception and interpretation of intonational prominence in varieties of South African English. In: Braunmüller, K., Gabriel, C. (Eds.), Multilingual Individuals and Multilingual Societies. John Benjamins, Amsterdam, pp. 335–348
3. Swerts, M., Zerbian, S., 2010. Intonational differences between L1 and L2 English in South Africa. Phonetica 67, 127–146
4. Zerbian, S., 2010. Recent developments in the typology of intonation. Linguistics and Language Compass 4 (9), 874–889
5. Zerbian, S., 2007. Investigating the prosodic expression of focus in Northern Sotho. In: Aboh, E., Hartmann, K., Zimmermann, M. (Eds.), Focus strategies: evidence from African languages. Mouton de Gruyter, Berlin, pp. 55–79

(b) **Other publications**
1. Zerbian, S., 2006. Expression of information structure in the Bantu language Northern Sotho. ZAS Papers in Linguistics 45

3.4   Research plan

3.4.1   Research questions

The goals of the project are three-fold:

(1) contribution to language description by eliciting data on prosody in two understudied non-standard varieties,

(2) definition of phonetic and phonological similarity in L2 prosody to be applied in theories concerning L2 production and perception, and

(3) development of a model of L2 prosody.

Language description. In order to fully understand the production and perception of prosody used for information structure, all interfaces of the model in (2) need to be investigated. The underlying level is considered to be universal, a view shared with project A6. L2s can show differences in the phonological categories of the surface level and/or at the phonetic level. Only the phonetic level can be observed directly. The underlying level can only be accessed indirectly through its meaning. As yet, the empirical basis for L2 prosody in German speakers of English and in speakers of Black South African English has not been fully investigated.

Q1: Are information structural categories, such as topic and focus, realized in L2 English by speakers of German and BlSAfE? If so, which categories are expressed prosodically, of what type are the pitch accents used, what is their distribution and their phonetic realization?

Q2: Do L2 listeners interpret native speakers' pitch accents in terms of their intended information structural contribution?

The role of phonetic and phonological similarity. The SLM states that phonetic similarity implies difficulties in acquisition. If sound structures are perceptually distinct, however, the acquisition of a new category is easier. A careful discussion of "similarity" of prosody is required. It needs to be investigated if similarity should best be defined at the phonetic level or at the phonological level. For the phonological level it needs to be noted that the phonological categories used in tone studies and in AM-approaches to intonation are identical, namely high (H) and low (L) tones. If these tones are universal, either as intonational tones, as lexical pitch accents or as lexical tones, which consequences would that have for the similarity of prosody across different languages?

Q3: How can similarity be meaningfully defined in the prosodic domain, given the universality of H and L tonal targets?

Q4: How phonetically similar are the L1s (German, Tswana) to the respective reference varieties (General American English (GenAmE) and General South African English (SAfE) in their prosodic implementation?

Q5: Does a correlation emerge between phonetic similarity and native-like production and perception, as predicted if the SLM is extended to the suprasegmental domain as a whole?

Modelling L2 prosody. Based on the results of the empirical study, a model of intonational production and processing in L2 prosody will be developed, following Féry et al.'s (2009) model for monolingual prosody.

Q6: For some selected information structural notions (e.g. topic and focus), what does the model of L2 prosody look like for two fundamentally different groups of L2 English? Does it correspond to the L1 model, except for language-specific phonetic implementation rules? Are there differences also at the surface level?

Q7: Is it possible to detect a commonality in models of L2 prosody? To what extent are differences in the model connected to phonetic and/or phonological similarity of the L1?

3.4.2 Methodology

Existing studies on L2 prosody differ widely in the methodology used and the target structures investigated. For example, Grosser (1993) investigates spontaneous speech, Jilka (2000) analyses data elicited by guided interviews, Rasier & Hiligsmann (2007), Zerbian (2013) look at guided semi-spontaneous speech, whereas Baker (2010), Huang & Jun (2011), and Gut (2005) examine read speech, controlled for the target structures to varying degrees. Structures investigated range from complex utterances to SVO-sentences and modified noun phrases.

As the methodology may influence the results (cf. Baker 2010) and in order to ensure cross-linguistic comparability, the project will collect data using the same/comparable methodology for the two language pairings under consideration. Systematically controlled target structures will be elicited under laboratory conditions. The Institute of Linguistics at the University of Stuttgart has a fully equipped Linguistics Lab which will be used for data elicitation on L2 English by speakers with German as L1. Data of GenAmE will be collected in collaboration with Prof. Isabelle Darcy's Second Language Psycholinguistics Lab at Indiana University, Bloomington. This reference variety has been decided upon because of a dominance of GenAmE mother tongue speakers in the language practice training in the department, a majority of students selecting GenAmE as their target variety, and existing links to the Psycholinguistics Lab at Bloomington. Data of BlSAfE will be collected in collaboration with the Department of Linguistics at the University of the Witwatersrand, Johannesburg, which the PI has been affiliated with as an associate research fellow since 2011.

Baker (2010) finds evidence that in experiments at the interface between prosody and information structure, the complexity and difficulty of the task interacts with the way structures are realized. She observes that in difficult tasks, learners rely on common prosodic patterns whereas in easy tasks they may successfully mark the focused constituent by accent placement. Therefore, data will be elicited using tasks which differ in complexity and difficulty. This will allow us to see whether and to what extent complexity of the tasks influences the two L2 groups. Question-answer pairs consisting of simple SVO structures can be considered an easy task, as the focused constituent can clearly be identified based on the *wh*-word in the question. Appropriate contexts for cognitively more demanding tasks will be developed in close cooperation with A6, building on Riester's work on information structural in natural speech (Riester & Baumann 2013, Baumann & Riester 2012).

Next to production data, perception and comprehension of prosody will be investigated in order to develop a more complete picture of L2 prosody, as schematized in (2). Experimental studies investigating the perception and comprehension of L2 prosody are rare. In Zerbian (2012) the perception of intonation in BlSAfE was tested by means of a task where participants heard modified noun phrases and guess what the preceding discourse was based on intonation. Although this task had been used in other studies successfully (e.g. Swerts et al. 2002), it proved difficult for all participants as it required considerable meta-linguistic analysis. Therefore, psycholinguistic experiments such as in Akker & Cutler (2003) (effect of focus and accent in phoneme recognition) or Braun & Tagliapietra (2010, 2011) (contrastive intonation in cross-modal associative priming in order to evoke contextual alternatives) will be developed. Again, facilities and necessary cooperations are in place for carrying out these perception studies.

3.4.3 Work packages

WP 1–4: Empirical basis

WP 1: Production of IS-prosody in L2 English by speakers of German

The empirical basis concerning the production of IS-prosody by speakers of German is patchy and even contradictory. For example, Gut (2009) investigates deaccentuation in learners' L2 prosody by means of a phonological learner corpus specifically designed to investigate the acquisition of prosody in a foreign language (LeaP-corpus, Gut (2009)). She reports that, across all L1s, learners of English deaccentuate given information in only 57.7 % percent of all cases (out of 92 words which could potentially be deaccentuated in their small corpus), whereas the four English native controls deaccentuated given constituents in 100 % of the cases (i.e. out of 8 possible cases of deaccentuation). We accessed the freely available LeaP-corpus to extract the results for those learners who have German as L1 (N=20). In the majority of cases (31/40), German learners of English deaccentuate given constituents. In those cases where they supposedly did not deaccentuate, an alternative analysis seemed possible too, namely that the nuclear stress shifts to the focused constituent and a postnuclear accent is realized. In contrast, the English controls never realized a postnuclear accent. WP 1 will elicit controlled data concerning pitch

accent placement and deaccentuation in L2 English by German speakers (for methodology, see 3.4.2). The analysis will be done in collaboration with INF, A2, and applying the tools developed in previous phases of the SFB in a silver-standard fashion. The phonetic realization will be investigated as well, given Atterer & Ladd's (2004) findings that prenuclear rising accents are implemented slightly differently in the L2 English of German speakers.

WP 1.1: GermanEnglish: 20 participants recruited from students at the University of Stuttgart (English Studies) with comparable background in terms of length of stays abroad and target variety (GenAmE)

WP 1.2: German: 10 participants recruited from students at the University of Stuttgart (German studies) as control and for WP 7

WP 1.3: English control: AmE, 10 participants, in cooperation with Second Language Psycholinguistics Lab (Prof. Isabelle Darcy, Indiana University, Bloomington), and for WP 7

WP 2: Production of IS-prosody in L2 Black South African English

For L2 BlSAfE, previous research has shown that focus is not expressed prosodically by the same means as in the reference variety GenSAfE (Zerbian 2013). It is an open question if other information-structural categories are expressed prosodically in this variety. The notion of topic is of utmost relevance in this respect as phrasing differences (and in connection with this tonal alternations) have been reported for right-and left-dislocated topics (e.g. Jokweni 1995 for the South African Bantu language Xhosa). In collaboration with INF and A2, and applying the tools developed in previous phases of the SFB in a silver-standard fashion, the phonetic realization will be investigated as well.

WP 2.1: Black South African English: 20 participants recruited from students at the University of the Witwatersrand, Johannesburg, with comparable background in terms of schooling and L1 (Tswana)

WP 2.2: Tswana as a South African Bantu language: 10 participants recruited from students at the University of the Witwatersrand, Johannesburg; as control and for WP 7

WP 2.3: General South African English as control: 10 participants recruited from among students at the University of the Witwatersrand, Johannesburg; and for WP 7

WP 3: Perception and interpretation of IS-prosody in L2 English by speakers of German

Little is known about the perception and interpretation of English intonation by German learners. Work by Braun & Tagliapietra (2011) on German learners of Dutch suggests that the interpretation of intonational meaning in L2 appears to be fast, automatic and driven by the associations learned in the native language. Psycholinguistic experiments will explore the interaction of prosody and interpretation in L2.

WP 3.1: German speakers of L2 English hearing native English: 40 participants recruited from students at the University of Stuttgart (English Studies) with comparable background in terms of length of stay abroad and target variety (GenAmE)

WP 3.2: GenAmE listening to GenAmE as control: 20 participants; in collaboration with Indiana U.

WP 4: Perception and interpretation of IS-prosody in L2 Black South African English

Initial findings suggest that although prosodic differences in GenSAfE are perceived by speakers of BlSAfE, they are not interpreted in terms of focus (Zerbian 2012). Again, the investigations will be expanded to other information structural notions such as topic, as existing research suggests that the notion of "topic" is central to the grammar of Bantu languages (Givón 1976) and that the native language shows prosodic correlates for this information structural notion.

WP 4.1: BlSAfE listening to GenSAfE: 40 participants recruited from students at the University of the Witwatersrand, Johannesburg

WP 4.2: GenSAfE listening to GenSAfE as control: 20 participants; in collaboration with the University of the Witwatersrand, Johannesburg

WP 5: Developing a model of intonational production and processing in L2 prosody

Results from the production, perception and interpretation of L2 prosody feed into the development of a model of L2 prosody. Data from native speakers as control groups will allow working out the language-specific instantiations of the model in the respective L1s and compare them to the L2 models. Finally, the question will need to be answered how L2 models of prosody differ from L1 models. Braun & Tagliapietra (2011) suggest that the interpretation of intonational meaning in L2 appears to be driven by the associations learned in the native language. This implies a connection of the two systems although the extent of the interaction is left open. It is also unclear how the connection would work in two languages which differ in their prosodic systems.

WP 6: The prosodic system of BlSAfE

In connection with the surface level of intonation (cf. in (2)) it is only natural to investigate more in detail how prosody in BlSAfE can best be described phonologically. Recent work on the prosodic systems of L2 varieties of English that emerge in contact with tonal languages makes the strong claim that these L2 Englishes are actually tonal (Lim 2011 for Asian Englishes, Gussenhoven (to appear) for the general

claim). For Nigerian English, Gussenhoven & Udofot (2011) show that each syllable is specified for a tone (function words carry L, content words carry LH where the H is realized on the stressed syllable), and that the only intonation found in this language are the boundary tones. The prediction is that BlSAfE, too, has sentence intonation that is best described like tone in tone systems, namely as carrying a tonal specification on every syllable.

WP 7: Phonetic similarity in L2 prosody

Transferring the SLM to prosody and formulating predictions concerning difficulties in acquisition crucially hinges on the phonetic similarity of prosody of the systems involved. Intonation in both German and Tswana must thus be compared to intonation in English in order to evaluate the phonetic similarity between all varieties under consideration. This can best be done building on earlier work in A2 on pitch accent variability and using the techniques developed in the previous phases of the SFB. This WP will thus be carried out in close cooperation with A2 and INF, working a.o. with the PaIntE-parameters (Walsh et al. 2013). More specifically, and as shown in the diagram in (3),

- phonetic characteristics of L2 English pitch accents, produced by L1 speakers of German and Tswana, will be compared to comparable L1 prosody produced in these languages to establish possible transfer effects from the respective L1s onto the L2s (=interference).
- L2 English productions will be compared to English controls to establish how closely the target has been attained (= attainment).
- L1 pitch accent productions of German and Tswana will be compared to English controls in order to compare the similarity of the phonetics of the prosodic systems (= similarity).

An interesting aspect (relating to WP 6) is to compare fine phonetic detail in the prosodies of the genetically unrelated languages English and Tswana by investigating similarity/variability between tone sequences and pitch accents.

(3) Predictions based on phonetic similarity
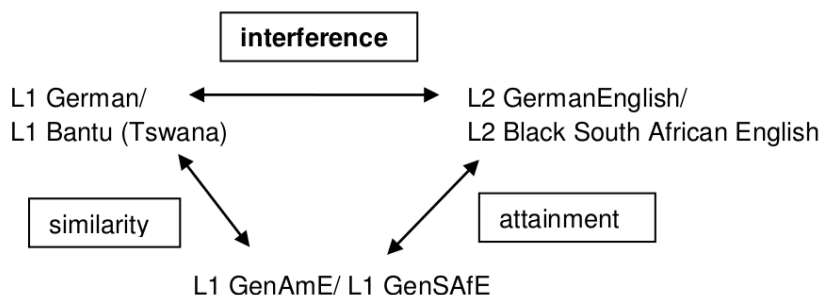
WP 8: Using the SLM for L2 prosody used for information structure

The results of WP 7 have repercussions for what is predicted to occur in production if Flege's SLM can be applied to prosody used for information structure as well. The predictions are that if similarity between prosodic systems is high, interference should be high too, and thus target-like attainment should be difficult to achieve. If similarity between prosodic systems is low, however, interference should be low and attainment should be easy. Thus, attainment is predicted to be better if similarity between prosodic systems is low. These predictions need to be checked on the empirical data and on the comparisons concerning phonetic similarity carried out in WP 7 in order to determine whether Flege's SLM model can be successfully applied to the production of L2 prosody used for information structure.

Timeline

WP	2014/2	2015/1	2015/2	2016/1	2016/2	2017/1	2017/2	2018/1
1: Production GermE	●	●	●	●				
2: Production BlSAfE	●	●	●	●				
3: Perception/interpretation GermE			●	●	●			
4: Perception/interpretation BlSAfE			●	●	●			
5: Model of L2 prosody					●	●	●	●
6: Prosodic system BlSAfE					●	●		
7: Phonetic similiarity in L2 prosody					●	●	●	
8: SLM for L2 prosody							●	●

3.5   Role within the Collaborative Research Centre

The project starts from the premise of incremental specification, namely that in speech production, the output of the syntactic component is not fully specified with respect to sentence prosody. Prosody

receives its full specification through local context (e.g. syllable structure, the location of word stress(es), syntax) and global context (e.g. discourse, information structure).

Languages differ in their prosody and consequently in their algorithms for the specification of prosody. The prosody of standard varieties of English, such as British or American English, has been studied in detail. However, little is known about prosody in non-standard L2 Englishes, although there are more L2 English speakers than L1 English speakers. The reason could be that L2 English is not a homogenous variety but shows tremendous variation depending on factors such as L1 of the speaker and proficiency. Data on L2 Englishes can thus be considered non-canonical, where non-canonical implies both understudied and more varied than canonical data. However, only an understanding of both "canonical" and "non-canonical" prosody will eventually lead to an understanding of how human language works.

A7 will collaborate with the following projects of the SFB 732:

- INF: integration of L2-data into the silver standard in order to analyze the transfer of prosodic categories from L1 to L2 and to determine phonetic similarity in prosody
- A2: see work package 7
- A4: automatic annotation of intonation
- A5 & A6: common interest and mutual exchange concerning the use of prosody for information structure in Westgermanic languages and in typologically different languages, focus prosody, deaccentuation/postfocal compression, prosodic variation

The common topic of projects in the A area is the variability of prosody. A7 will participate in a workshop series jointly organized by the A projects, as further detailed in the general part. The work on GenSAfE and BlSAfE will benefit from the Mercator Fellow Prof. Dr. Justus Roux, current Director of the Research Unit for Languages and Literatures in the South African Context, at North-West University, Potchefstroom, South Africa. Professor Roux has worked both on the phonetics and phonology of tone in South African Bantu languages as well as on South African English.

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