

# Phonetic convergence as a paradigm of showing phonetic talent in foreign language acquisition

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This paper gives an overview of an ongoing Ph.D. project in cooperation with the DFG supported project “Language talent and brain activity” at the Universities of Stuttgart and Tübingen. Considering the socio-psychological background of communication accommodation theory and the previous research on convergent behavior, done predominantly in linguistically homogeneous situations, it wants to turn to convergence during interaction in a second language environment. Shifting the focus to native-nonnative interaction can provide valuable insights into both, second language communication behavior and the underlying mechanisms enforcing or hampering convergence. The specific aim is to determine to what extent the factor of phonetic language aptitude translates into phonetic convergence during conversation, which has been defined as an increase in segmental and suprasegmental similarities between two speakers (Pardo, 2006).

## Introduction

Individuals differ to a considerable degree in the ability to learn a foreign (second) language. Those differences in the rate of learning and the overall acquired competence are the result of interindividually varying psychological and sociological features. One of them is undoubtedly the factor of language talent that has unfortunately been left out of research on second language acquisition for a long time due to the assumed equality of chances in learners. The topic has recently become more popular again, amongst other reasons due to the development of new neuroimaging methods, allowing insights into the working brain and the tracking of specialized brain areas.

This Ph.D. project is aimed at investigating the link between second language aptitude and the specific ability to accommodate to a conversational partner in a face-to-face situation. Due to the special status of the phonetic sub-skill of language talent, which appears to run separately from other subcomponents of talent, attention is focused on phonetic convergence within native-nonnative interactions.

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## **Communication Accommodation Theory**

Research on the phenomenon of phonetic convergence has its origin in the Communication Accommodation Theory (CAT) that has been established in the 1970s, first under the term of “speech accommodation theory” (SAT, Giles, 1973). SA theorists began to argue that some aspects of the Labovian paradigm (Labov, 1966) concerning the formality-informality of context could be explained by interpersonal accommodation processes. They wanted to introduce a more detailed concept of *context*, which was a major term in sociolinguistic theory of that time. One of the goals was increasing the attention for specific dimensions of context, like language itself and the role of the receiver in the interaction (Giles, Coupland & Coupland, 1991). Since then SAT focused on clarifying the motivations underlying speech, the constraints imposed on it and finally their consequences for social interaction (Giles et al., 1991). After the theory has widened its focus onto nonverbal behavior and general dimensions of discourse, the theory evolved to communication accommodation theory (Giles et al. 1987, cit. after Giles et al., 1991).

CAT defines itself nowadays as an interdisciplinary approach placed at the interface of social psychology, sociology, sociolinguistics and communication. The field of interest has also evolved from a merely interindividual perspective to a broader perspective of macrovariation. The language used in interaction can be a remarkably good indicator of status differences, ethnic boundaries or can as well define ingroup or outgroup boundaries and impose conformist behaviors (Shepard, Giles & Le Poire, 2001). The crucial thesis of CAT states that language is used to achieve a desired degree of social distance between self and an interacting partner. They argue that accommodation is a complex, context-sensitive set of alternative behaviors available to interacting partners in a face-to-face situation. As mentioned earlier, it can serve to achieve solidarity with or dissociation from a partner, in a dynamic setting with online feedback (Giles et al., 1991). This distance can be negotiated by means of approximation strategies (convergence, divergence, maintenance and complementarity), interpersonal control, discourse management and interpretability (Shepard et al., 2001).

### **Accommodation strategies**

The term divergence is used to refer to a set of behaviors allowing speakers to distance themselves in terms of verbal and nonverbal behavior from their partners. This can be achieved via an explicit accentuation of differences in speech style and/or facial expressions and gestures (Giles et al., 1991). As an outcome of later research the notion of “perceptual/subjective divergence” was introduced, covering the possible discrepancies between the performance and the actual perception of a conversational partner (Shepard et al., 2001).

Convergence, as one of the main strategies within the CAT framework, describes the adaptation of communicative behaviors towards those of a conversational partner in various verbal and nonverbal features. The characteristics being adapted to can range from gestures, smile, facial affect, head nodding, information density, voice quality, speech rate, utterance length to pausing frequencies and response latency (Giles et al., 1991).

Speakers may also adhere to their own current speaking style and wish neither to converge nor to diverge. Intended maintenance may however often be interpreted as diverging from the interlocutor (Shepard et al., 2001). Speech complementarity strategies on the other hand involve the accentuation of distinctive features between partners with different social roles, e.g. men speaking with a lower voice while talking to women (Hogg, 1985).

Accommodation can vary in many dimensions, be it direction, degree or level. Since all strategies are highly dependent on the given situational context, many variables can influence

the final degree or type of accommodation. Crucial for the choice of upward or downward accommodation is the power structure within the dyad (Street, 1982). Upward convergence describes a movement towards a socially more accepted variety or style whereas downward accommodation relates to the adaptation of less prestigious forms (Giles et al., 1991). Other distinctions can be made as to the modality (unimodal vs. multimodal, i.e. occurring across several different behaviors), the direction (unidirectional vs. mutual) and symmetry. It has also been remarked (Shepard et al., 2001) that accommodation can occur partially or to a “full” extent, where the partners’ behaviors match exactly.

## **Phonetic convergence**

Although many studies since the emergence of the Accommodation Theory have investigated the linguistic properties of convergent behavior, the term of phonetic convergence is relatively new. It has been defined in terms of an increase of segmental and suprasegmental similarities between the interacting speakers (Pardo, 2006).

An important question within the research on phonetic accommodation remains the role of the perception-production link. Some accounts propose that speech perception automatically yields relevant linguistic (in this case phonetic and phonological) parameters that cause production and lead directly to imitation (Sancier & Fowler, 1997). If this holds true and there indeed is a very close link between perception and production, it should favor a fairly exact imitation of words at an articulatory and acoustic level. However, this has been proved to be extremely unlikely since even for a single speaker no two productions of the same utterance are acoustically or articulatory identical (Pardo, 2006). Far more probable is an intended imitation with a moderate degree of exactness. Interestingly, none of the accounts being currently under discussion explains the influence of obvious perception and production limitations and other factors yielding discrepancies in the imitative responses (Pardo, 2006).

So far phonetic convergence has been studied along the following features:

- speech rate (Street, 1984)
- fundamental frequency, amplitude contours (Gregory, 1990)
- voice onset time (VOT) (Sancier & Fowler, 1997)
- amplitude, utterance duration and rate (Oviatt, Darves & Coulston, 2004)
- perceptual similarity of pronunciation (Pardo, 2006).

Most of the studies, except that of Sancier and Fowler (1997), investigated phonetic convergence in a native language environment. Sancier and Fowler concentrated on the gestural drift between the two languages of a bilingual speaker. Zuengler (1991) has pointed to the crucial role of accommodation in a second language acquisition context, analyzing data on native-nonnative or fully nonnative conversational interactions. The described dissertation project wants to provide further details on second language face-to-face communication and explore possible underpinnings of phonetic convergence in an L2-environment.

## **Convergence and language aptitude**

Considering the described biases in the imitation quality and the interindividual and context-dependent variability in the degree of convergence, we want to investigate the link between phonetic convergence and the individual differences in L2-speakers, more specifically their phonetic aptitude. Our main premise is based on the direct link between the ability to converge in pronunciation and a general phonetic language talent. When converging in pronunciation to a foreign language communication partner, the skills to do so obviously have to be given. The negative consequence of this would be a lack of convergence due to poor

(language) ability (Giles & Powesland, 1997). This is even more significant when the accommodation takes place during a relatively short conversational interaction since it rules out the possibility of underlying long-term learning processes concerning a foreign accent (as it would be the case during longer stays in a foreign language environment).

### **Assessing phonetic aptitude**

Language talent is considered to be one of the main features, in which language learners differ from one another. Studies on individual differences in the process of second language acquisition have shown that variation in language aptitude, personality traits and attitudes (motivation) leads to significant contrasts both in the rate of learning and in the eventually acquired proficiency (e.g. Dörnyei, 2005). Some factors as openness, extraversion and empathy combined with a high aptitude are assumed to translate into better communicative skills and phonetic accuracy (due to a lower socio-affective filter, Krashen, 1981).

Skehan (1998) defines talented learners simply as people with greater levels of aptitude and therefore likely to make faster progress in language learning. This language aptitude can be further divided into subareas. There is e.g. strong evidence for the phonetic subcomponent of talent to run fairly independent from other sub-skills. Well known in the literature is the so called “Joseph-Conrad-phenomenon”, named after the famous Polish-born writer. It describes a situation in which despite perfect knowledge of grammar and vocabulary, a foreign accent in the second language is still prominent. Schneiderman & Desmarais (1988) provide also evidence for the phonetic sub-skills to have a special status, differing in many points especially from the grammatical competence. Some data is available from research on the maturational constraint/critical age period (Birdsong, 2006), where nativelikeness is reported less often for pronunciation than for other competences in a second language. The independence of the phonetic component of language talent may as well suggest the existence of a separate underlying neural substrate.

The independent role of a phonetic component of talent has also been recognized within frameworks for language aptitude testing. One of them is the Modern Language Aptitude Test (MLAT, Carroll & Sapon, 1959), which operationalized the following factors underlying aptitude: phonemic coding ability, associative memory, inductive language learning ability and grammatical sensitivity. Phonemic coding ability was described as the capacity to both, make sound discriminations and to code foreign sounds in a way that allows a recall at a later moment in time (Skehan, 1998).

Within our project a comprehensive approach for testing phonetic language talent was introduced (Jilka et al., 2007). Applying an extensive test battery should therefore allow covering not only the linguistic but also the psychological and sociological characteristics resulting in individual differences between the L2-learners. All subjects are German native speakers learning English as a foreign language. Other variables like educational background, brain lateralization and handedness, amount of time spent in English speaking countries are also controlled for. The linguistic part includes production and perception tests in German and English, with various elicitation techniques ranging from free speech to story-telling, direct and delayed imitation and reading tasks. The focus of the perception tasks lies on the identification of foreign accents and the prosodic features of utterances (in both native and nonnative contexts). The phonetic part of the test battery serves as a means of identifying all subskills that could underlie pronunciation talent (e.g. a sensibility for identifying prosodic variation or segmental changes) and tear them apart from mere proficiency.

After an additional series of psychological and personality questionnaires (including e.g. non-verbal intelligence, verbal intelligence, empathy, mental flexibility), the tests will be evaluated and the subjects finally classified into two groups according to their pronunciation

talent. Both groups, the high-aptitude and low-aptitude learners, will be subject to further research on phonetic convergence in native-nonnative interaction. Testing for phonetic convergence is especially promising for showing phonetic *talent* as opposed to *proficiency*, since convergence in pronunciation within a short conversation rules out the possibility of underlying long-term learning effects.

## Methodology

As to the accommodative behavior of conversational partners in an L2-environment the following predictions can be made:

- More talented learners will exhibit a stronger tendency to converge in their pronunciation to their conversational partners (native speakers of English).
- Less phonetically talented speakers should show considerable difficulties in accommodating to their partner.
- Certain segmental and suprasegmental features will be adapted easily and with a good outcome.
- Certain features of the English accent should be hard to take up and subjects will often fail to converge in those cases.

In order to investigate the above questions, a diapix experiment is planned (Bradlow et al. 2007). Forty participants will be asked to perform a diapix task in English together with a native speaker of English. In order to control for any unintended accent shifts, a speaker of Standard Southern British English (SSBE) and of General American (GA) will be invited, according to the subjects' accent preferences. The diapix is a dialogue based picture-matching game that elicits a wide range of utterance types and provides balanced speaker roles (Fig. 1a and 1b). The participants are confronted each with one picture of a set which differ in ten details from one another. They can't see each other's picture and need to spot the ten differences while talking to their partner and describing their own picture. The native speaker will be instructed to pay special attention to avoiding any downward convergence to the nonnative accent their partners might have. After the experimental session, performed in an anechoic chamber, the recordings will be subject to acoustic analyses enabling both a global (e.g. speaking rate,  $f_0$  contour, pitch range) and a fine-grained picture (e.g. MFCCs; episodic memory store of amplitude envelope signals, Wade 2007) of the convergent features. A further step will be a perceptual judgment experiment and a search for possible correlations between these results and results of the previously performed psychological tests.



Fig. 1a and 1b: A set of pictures for the diapix task with ten differences to spot (with the courtesy of Ann R. Bradlow).

## Summary

This paper gave a brief overview of the theoretical underpinnings of speech convergence, grounded in the Communication Accommodation Theory and its relation to some aspects of second language acquisition research. The planned research on phonetic convergence in native-nonnative interaction is supposed to answer a range of questions about the phonetic subcomponent of language talent and the communicative behavior of second language learners. Obtaining auditory data from a diaphonetic task will enable a detailed analysis of the convergent behavior of talented in contrast to untalented learners of English as an L2. Especially interesting is the extent to which those two groups differ from each other in adapting native features of the English accent and which aspects are particularly easy or difficult to take up. In addition to that, assessing pronunciation talent via phonetic convergence could provide an answer to the still open questions on the functioning of the perception-production link.

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