Special Issue: The adaptive nature of linguistic behavior

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ABSTRACT

Not just diachronic change or synchronic variability in linguistic structure, but also the shape of speakers' expressive strategies for navigating natural verbal interaction can be seen as reflections of the fundamental human capacity for adapting to novel communicative circumstances. The adjustments are observable at all layers of language — sounds, prosody, lexical changes, shifts in grammatical organization — and also pose questions concerning adaptation at both the individual and community levels. In this introductory framing of the present volume, the conceptual underpinnings of the quest for adequate explanations of adaptive processes are consistent with a set of assumptions that are associated with, broadly speaking, 'socio-cognitive' approaches to language: (i) socio-pragmatic and cultural grounding of verbal interaction, (ii) reference to domain-general cognitive capacities, and (iii) emergence of linguistic categories and their organization from recurring patterns of use. Linguistic analysis focused on the adaptive aspects of language and language use thus aims at capturing the speakers' interactional competence; this includes both narrowly linguistic aspects and non-linguistic patterns of behavior, which, taken together, help us understand better all the factors involved in successful communication.

1 INTRODUCTION

This volume gathers a selection of research topics addressed within a large multidisciplinary project focused on creativity and adaptability,[1] in which adaptation processes are understood broadly as innovative responses to the environment. This definition of course applies to all kinds of subjects: from biological organisms to mental states and thought processes in individuals, to group behaviors at communicative, organizational and institutional levels, all the way to complex societal and global contexts; it is also clear that adaptation processes observable at these distinct domains necessarily involve a variety of mutual dependencies and interactions.

The context of this issue is much narrower, focused only on language: the individual contributions present a variety of examples illustrating the variability and adjustments that arise naturally in the course of authentic verbal communication,

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in both diachronic and synchronic contexts, in a single language, or in contact situations. Nevertheless, the main research goal of the project as a whole finds its direct and in some ways particularly illuminating reflection here as well since adaptive responses observable in language are shaped by complex socio-pragmatic and culture-specific conditions, which speakers constantly evaluate on the basis of their experience and their communicative needs, and then react in accordance with their understanding and experience. In other words, language users are not just speakers of a language in the sense of mastering an abstract symbolic system that facilitates verbal communication. They are also unique cultural subjects, whose verbal interactions cannot be understood apart from the cultural and social grounding in which the individual speakers seek to accommodate the shared linguistic knowledge and experiences.

This perspective is fully consistent with two fundamental assumptions that underlie contemporary linguistic research, namely, that (i) language is a complex adaptive system (e.g. Steels 2000; Ellis and Larsen-Freeman 2009; Coulmas 2009; Croft 2014) and (ii) language evolution is naturally connected to cultural and biological evolution (e.g. Croft 2006; Steels 2012; Dediu et al. 2013; Sinha 2015; Mendívil-Giró 2019). Most of the current research appeals particularly to the cultural dimension as a source of adequate explanations for the developmental paths observed in the way languages 'self-organize' through specific patterns of language use. Emphasis is thus placed on taking language as a specific socio-cultural phenomenon. An easily visible and readily understandable connection between language and its cultural grounding presents itself in the domain of lexical inventories, where sensitivity to social and cultural changes is quite directly reflected in the ways speakers adjust their mental lexicons. But the complex web of cultural, social, as well as conceptual motivations for adaptive shifts in speakers' linguistic competence goes well beyond just the vocabulary, and the present volume attests to this breadth as well.

2 ADAPTATION IN LANGUAGE AND COMMUNICATION

The questions addressed in the individual contributions all support the view that adaptation is an inherent part of language and that it is governed by specific communicative and interactional principles that may affect the shape of linguistic structure and its variability. This, in turn, means accepting the familiar and long-standing functionalist assumption, prominently represented also by the Prague School tradition, that language is above all a unique tool for communication. In a further elaboration on this basic premise, contemporary research is keenly focused on the repeatedly made observation that in the act of communication, speakers have to constantly adjust and readjust to each other and to a given speech situation in order to successfully pursue their communicative agenda in a joint verbal activity. One such perspective is naturally associated with the rich domains of interactional linguistics, for more recent examples cf., *inter alia*, Brems et al. (2014), Thompson et al. (2015), Gras and Sansiñena (2015), Etelämäki (2016), Su (2016), or Couper-Kuhlen and Selting (2018), and sociolinguistics (e.g. Deumert 2014; Arnaut et al. 2016) and draws sys-

tematic attention to language users as active participants in shaping and reshaping their language.

However, plausible explanations for the dynamic character of verbal interaction and its effect on establishing relatively stable linguistic categories and their organization require crucial reference to the cognitive basis of language. The view of language as a socially and culturally motivated behavior thus has found its way also into cognitively oriented theorizing about the nature of linguistic structure and its mental representations. In other words, the interactional basis of language is explicitly acknowledged also in research that has been concerned primarily with the nature of human cognition (including the notion of social cognition) and its manifestations in language. It follows that this focus introduces a host of additional issues to consider and integrate in more realistic and comprehensive analyses of speakers' linguistic competence and behavior. The result has been a number of empirically supported theoretical proposals that take language to be fundamentally a multidimensional dialogic phenomenon, with all the theoretical and methodological implications such a perspective brings along. A convincingly formulated argument in support of the explanatory potential of such a perspective is found especially in Dor (2015) but also in a number of other works that examine the relationship between the domain-general human capacity for developing language and its manifestations in communicative practice, as attested in authentic verbal interaction (Zlatev and Sinha 2008; Dor et al. 2014, among others). On the whole, the integration of the cognitive and social perspectives corresponds to what has been aptly labeled as the 'cultural model' (Mendívíl-Giró 2019) in the context of evolutionary linguistics as general theoretical framing for capturing and explaining adequately the adaptive processes observed in language. Such a model has been addressed and/or argued for in a number of proposals (e.g. Heine and Kuteva 2007; Steels 2007, 2012; Jackendoff 2010; Christiansen and Chater 2015; Sinha 2021) and the debate on its merits continues.

3 SYNCHRONIC AND DIACHRONIC PERSPECTIVES

Interest in the adaptive substance of language naturally evokes the domain of *language change*, i.e. research concerned with issues inherent in diachronic analyses. This association is based on the hypothesis that if we wish to understand and explain the nature of linguistic patterning as emerging from speakers' interactional experience, we have to also accept that the mental representations of linguistic organization are not static and immune to adjustments. The cognitive perspective then contributes several important conceptual tools that facilitate a systematic and cognitively coherent investigation of the inherently dynamic nature of language, including its multimodal properties. Among the crucial concepts are categorial gradience, structural fluidity, gradualness in the emergence of grammatical structure, and intersubjectivity; all of them — some more, some less directly and explicitly — point toward the adaptive nature of language as one of its definitional features and, in turn, highlight the need for paying attention to language use as the natural source of changes. Since language is non-linear in nature, processes that underlie its variability necessarily

involve multiple layers of adaptations, affecting all levels of linguistic organization: grammar, vocabulary, phonic patterning, information packaging, discourse navigation, socio-pragmatic properties, etc., as well as their potential alignment with gestures and more generally body language in its various forms.

The process of gradual and context-dependent formation of new grammatical categories as arising in the context of authentic usage has been illustrated in a number of diachronic studies that trace the development of linguistic categories or a reorganization of a particular subsystem (e.g. Heine 2002; Diewald and Bergs 2009; Bybee 2010; Traugott and Trousdale 2010; Fried 2015; Petré and Van de Velde 2018; among others). Studies of syntactic change, for example, document that the changes cannot be reduced to random processes in autonomous systems of linguistic signs but are primarily motivated by the co-occurrence of semantic and pragmatic pressures of specific linguistic expressions in a specific (type of) syntagmatic context and communicative setting. The same is expected to apply to changes at all levels and both in L1 and L2, as shown, e.g., in cases of phonetic convergence (Pardo 2013) or in various patterns of resonance structures in the flow of discourse (e.g. Du Bois 2014; Nir et al. 2014; Brône and Zima 2014). Only when we examine the way linguistic units are attested in authentic language use can we discover mechanisms that help explain language emergence as well as its development over time, and to properly situate its adaptive properties.

It is also apparent that changes, whether detected across stretches of time or identified as synchronic variation in any given time period, including present-day material, always follow roughly the same general path: usually starting as small-scale, feature-level, imperceptible adjustments which can, over time, manifest themselves in perceptible changes. This conceptualization of diachronic processes as rather gradual developments is at the very core of that strand of grammaticalization theory which seeks explanations for linguistic change in interactionally motivated reinterpretations of existing patterns (e.g. Traugott 1989, 2014, 2022; Hopper 1998; Bisang et al. 2004; Heine and Narrog 2009; Fried 2009, 2015; De Smet 2012). On a more general level, this approach extends also to a broader aim of advancing our understanding of the nature of language emergence, development, and variability, including the question of factors that may either facilitate, or inhibit a particular change. But regardless of specific focus, this theoretical framing of diachronic issues, as documented in a rich body of literature, is crucially based on the hypothesis that linguistic structure and organization is grounded in speakers' cognitive capacities and communicative practice, especially with regard to speakers' capacity for processing new or partially modified linguistic patterns. Consequently, this also presupposes the integration of perspectives taken from the study of human psychology and cognition (e.g. Sinha 2012; Zlatev 2012; Janoušek 2015; Zlatev et al. 2016).

A more recently explored area in which the adaptive processes can be easily detected is the research focused on spoken material and particularly *spontaneously produced language*, in which online processing and immediate adjustments are crucial for engaging in successful communication and which can thus be traced while 'in the making'. The primary target in this research have been various discourse-relevant categories, which are somewhat harder to define systematically due to their

non-propositional meanings and less tangible functions within rich polysemies, but which play a crucial role in the way speakers can navigate a natural conversation, be attuned to the interlocutors' emotional involvement, express epistemic meanings, and signal their own subjective attitudes. Existing research shows that these categories are often recruited from erstwhile grammatical forms (e.g. Traugott and Trousdale 2010; Fried 2009, 2021; Gras and Sansiñena 2015; Shor and Inbar 2019; Cornillie and Gras 2020) and so this domain often intersects with the diachronic approach described above. It also provides additional evidence that linguistic categories are often part of more complex patterns and that both their shape and their function are crucially dependent on an intricate interplay of various contextual conditions, including syntagmatic structure, text type, phonic patterning, etc.

Needless to say, it is specifically the domain of spoken interaction that highlights the need to address the multimodal nature of communication. This concerns *prima facie* gestural patterns (as clearly non-verbal in nature) and the search for any recurring patterns that appear to constitute a systematic co-speech layer of meaningful and predictable contribution in aiding the interlocutors in their interpretive task. The gesture-related research, with both empirical and theoretical emphasis, has become a very active domain within cognitive linguistics, raising a number of new theoretical and methodological questions (e.g. Steen and Turner 2013; Mittelberg 2017; Zima 2017; Zlatev et al. 2017; Inbar and Shor 2019; Harrison et al. 2021; among others).

But focus on spoken language also draws attention to its phonic features (whether prosodic or segmental) as an indispensable source of interpretive clues in navigating spoken interaction. Sound patterns are strictly speaking part of the verbal resources that constitute speakers' knowledge of a language but until quite recently, partly due to practical impediments, very little systematic and empirically solid work has focused on the alignment between grammatical form, semantic and/or functional contribution, and the accompanying sound patterns. And yet, existing scholarship concerned precisely with these issues (more recently e.g. Barth-Weingarten 2010; Borràs-Comes et al. 2014; Nikiforidou et al. 2014; Ward 2019; Machač and Fried 2021; Fried and Machač 2022) shows that intonation, segmental reductions, tempo, intensity, etc. also participate in adaptive processes and may speak quite directly to the way interlocutors can assess the speech situation and mutual understanding of what is being communicated.

However, still awaiting systematic research is the possibility that there might be a detectable relationship between gestures and sound patterns, as is also pointed out in the one multimodality-focused contribution in this volume. It is clear that noticeable progress on this front will depend on further methodological, theoretical, as well as practical advances. A fundamental requirement for systematic investigation of these questions is the availability of sufficiently large and appropriately tagged corpora of spontaneously produced interactions (so far a distinctly limited resource). But it will be equally important to develop adequate usage-based criteria for assessing the status of multimodal features to begin with; without this theoretical and methodological foundation, the challenge of developing sufficiently comprehensive and empirically supported representations of speakers' interactional competence in its full complexity remains open.

4 PAPERS IN THIS VOLUME

The volume attests to the breadth of perspectives from which linguistic adaptation can be studied and documented. All of them examine the question of how language use affects the shape of linguistic structure, whether we focus on the formation of specific grammatical categories or explore the variable properties of existing linguistic patterns. Collectively, the studies illustrate the full range of linguistic domains, from morphology to syntax to lexical organization to conceptualization patterns to phonetic, prosodic, and gestural aspects of language use. The first set of contributions addresses topics that are situated in diverse monolingual settings (Czech, English, Italian), presenting both synchronic and diachronic perspectives in exploring linguistic variability as a general question and including the multimodal nature of linguistic interaction. In contrast, the second section gathers papers focused on adaptation arising in contact situations, some of which also introduce issues of L2 acquisition or language processing. All of them involve Czech as L1 or L2, but in different types of contact settings (involving Slovak, English, and French) and in the context of different linguistic phenomena, ranging from lexical to prosodic to segmental phonetic.

Regardless of this — admittedly somewhat arbitrary — division, some of the papers in either section are more or less explicitly concerned with the cognitive underpinnings of the phenomena in question, or at least touch on the issues of (re)conceptualizations reflected in a given process. This is a crucial aspect of any investigation concerned with what speakers do when they interact and what may motivate the observable adjustments in their linguistic/interactional knowledge, as it helps advance our understanding of the complex nature of the adaptive processes. Thus whether or not a particular study is framed by any of the broader theoretical concerns briefly outlined above, their empirical import and analytic findings certainly can serve as a basis for further theorizing.

In a corpus-based study of gesture-prosody alignment in spontaneously produced speech, **Eva Lehečková**, **Jakub Jehlička** and **Magdalena Králová Zíková** address an as yet little-studied aspect of multimodal patterning, namely, the relationship between manual gestures and prosody (pitch and intensity). They examine the patterning Czech speakers use for marking specific distinctions associated with information-packaging in the flow of personal narratives. In a quantitative and qualitative analysis, they demonstrate that contrastive construal in spoken Czech is consistently signaled by a specific pattern of misalignment between gesture and intonation. In explaining this observation, the authors explicitly appeal to the cognitive dimension of linguistic behavior (a general cognitive process based on recognizing contrasts). The analysis makes the point that the visual component should be treated as comparable to the auditory one in language processing, in both production and perception.

Issues involved in establishing a grammatical category over time are addressed by **Ondřej Tichý** in his reflections concerning the development of countability as part of the English grammatical system. Specifically, he traces the ways countability was conceptualized by grammarians and lexicographers across the span of six centuries

(1400s–early 1900s), from its emergence and early history to its prominent status in the grammar of the present-day language. Careful examination of the meta-linguistic commentaries uncovers a number of factors that appear instrumental in the overall categorial development and suggest various sources of motivation for treating the notion of countability as an important topic within grammatical descriptions and theorizing, including various pedagogical implications. The findings provide a solid conceptual groundwork for an anticipated quantitative corpus-based study of this important grammatical category.

In **Pavel Štichauer**'s paper, variation is addressed in the context of mixed auxiliation systems attested in Italian dialects. The material raises theoretical questions inherent in grammaticalization research concerning the intra-paradigmatic distribution of patterns belonging to distinct paradigms. The account proposed here is based on the hypothesis that such a system is the result of merging two competing patterns — one dominant, one receding/unstable — which gradually develop into a newly reorganized mixed paradigm. The process is, by hypothesis, facilitated through the existence of a specific abstract pattern, commonly available in other dialects, in which the original semantic motivation for divergent paradigms is clearly lost and which provides a basis for the gradual removal of free variation in a portion of the two input patterns. The proposal highlights the possibility that speakers may use different adaptation strategies within a particular morphological paradigm and, crucially, a particular new pattern may have multiple sources.

Michal Škrabal's contribution presents a corpus-based study of a currently unfolding process of (morpho-)lexical innovations that keep arising in response to a new and salient reality. The initial single lexical borrowing from English — the word *lockdown* — not only enters the inflectional paradigm of the target language (Czech) but quickly expands to a strikingly rich spectrum of neologisms through a number of word-formation processes afforded by the Czech derivational system. It is thus not a simple case of borrowing a word from another language; the material suggests at least three important conclusions that can be justifiably drawn from the analysis: such a borrowing can (i) be very naturally integrated into the receiving language and its grammatical organization (morphological, syntactic, phonetic, etc.), (ii) respect its socio-pragmatic constraints and, at the same time, (iii) exploit creatively new conceptualization possibilities inherent in the local cultural setting.

The study presented by **Adam Kříž** and **Jan Chromý** examines the question of interlanguage as a specific adaptive stage in contact situations as manifested through speech errors produced by bilingual speakers in L2 picture-naming task. The material is unusual in that it traces the observable adjustments in two genetically and geographically very closely related and mutually intelligible languages (Czech and Slovak), which sets the study apart from the focus of existing research. In a qualitative analysis based on their own experimental data, the authors work with the concept of interlanguage analogies and systematic L1/L2 blends. They hypothesize about the motivations for the speakers' internalization of patterns based on such analogies, while also allowing the possibility that lexical access in receptive bilinguals might be affected by other factors as well, such as L2 proficiency, word familiarity, or interlanguage correspondence frequency. The research is presented as a viable starting point

for formulating novel hypotheses for follow-up quantitative studies on lexical access in bilinguals.

In the contribution by **Tomáš Bořil**, **Pavel Šturm**, **Radek Skarnitzl**, **Marie Hévrová**, and **Barbara Köpke**, adaptation is examined in the context of L1 attrition due to intense contact with L2 majority language. The study focuses on the effects of French intonation patterning on the native language of Czech expatriates and specifically on measuring how the intonational character of L1 (Czech) is affected by salient intonational features of L2 (French). The material shows an observable adjustment toward greater use of non-continuation rise typical of French speech and absent in native Czech speech. The findings thus touch on the general issue of resonance as a particular kind of adaptive behavior and also highlight the fact that L1 attrition involves all layers of linguistic knowledge, including its phonic aspects. It would be interesting, in future research, to trace such developments also in terms of which L2 features tend to enter the L1 speakers' speech early and which later, or perhaps never.

A particular issue in phonetic adaptation in L2 acquisition is treated in the paper by **Pavel Šturm**, **Joanna Przedlacka**, and **Arkadiusz Rojczyk**. Their research aims at identifying the conditions under which native speakers of Czech may best imitate the glottal stop pronunciation of the English phoneme /t/. The results of a shadowing task experiment indicate that successful imitation appears more sensitive to the similarity in the phoneme's position in a pattern than to the frequency of use in the learner's English input. The experimental outcome also suggests additional factors that may be involved in the relative degree of adaptation and that warrant further examination. Not only is there the question of simply recognizing a position in a pattern as the relevant clue vs. forming a phonological category, but also the role of L2 proficiency and the concomitant potential L1 interference in imitating the L2 system. In this respect, the study clearly points toward differences between imitation and learning: the former does not necessarily result in the latter.

As hinted in these brief summaries, all the studies share a strong empirical basis and rely on various combinations of qualitative and quantitative analyses. Overall, we can see a breadth in both data sources and methods, ranging from data extraction from old texts to contemporary material from monolingual corpora to data obtained through experimental work.

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