The transmission of meaning by prosodic phrasing

A comparison of French with English and German
using no Ls and Hs

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This paper examines the relationship between phonetic exponents of syntagmatic prosodic structuring and functions in speech communication in English, German, and French. Two strands are distinguished in this substance – function relation: the transmission of semantic structures in propositional, appellative, and expressive meaning, and the facilitation of this transfer from sender to receiver by rhythmic organization. Bundles of several weighted feature values contribute to the signalling of hierarchies of prosodic phrasing to map semantic and rhythmic structures for communicative effect. French and the Germanic languages differ more specifically in the rhythmic strand.

Keywords: prosodic phrasing, communicative function, rhythm, intonation models

1. The theme of the Workshop in relation to The Kiel Intonation Model

The Workshop “Intonational Phrasing in Romance and in Germanic” was organized as a platform for the discussion of prosodic phrasing patterns in the syntagmatic structuring of utterances in Romance and Germanic languages. One objective was the examination of cues for the signalling of phrase boundaries, e.g., pitch phenomena, timing, pauses, acoustic energy, and their potential different weights to signal prosodic phrasing of utterances in different languages or language groups. The second objective concerned the relationship between prosodic and syntactic phrasing of utterances, as regards their convergence or divergence. It was also regarded timely for prosody research to concentrate more on the analysis of spontaneous speech. Autosegmental Metrical Phonology (AM) was suggested as the theoretical and methodological frame for the discussion.
This paper deals with both objectives in a comparison of French with English and German. But it does not fit into the AM framework since its author starts from different theoretical premisses. However, the inclusion of diverging views in the discussion is crucial for scientific progress and prevents the setting of a fashion in what may be called the sociology of science. Some preliminary comments seem therefore in order to explain the epistemological, theoretical, and methodological reservations that do not let the present author consider AM and its labelling tool ToBI appropriate for a research paradigm of *speech communication science* to answer its basic question: “How do humans transmit meaning by speech for communicative functions in the languages of the world?” The author’s own approach is represented by the *Kiel Intonation Model (KIM)*, which is almost as old as AM in the US and older than the European, especially German versions of AM. For recent summaries and further developments of KIM, the reader is referred to Kohler (2006, 2009b), Niebuhr (2007a, 2007b), Peters (2006), Kohler, Kleber, Peters (2006), with further references contained therein.

1.1 A critical view of AM as a research paradigm

1.1.1 AM as part of Generative Grammar

Generative Grammar is in the Cartesian tradition of the philosophy of the human mind, where in the mind – body dualism mental categories take precedence over their embodiment in production and perception, and what is more, they are postulated as being innate. In this theory, linguistics needs to aim at a representation of the abstract *form* that underlies human language, whose *substance* in social interaction is only relevant as long as it provides insights into the underlying linguistic structures of Universal Grammar. This led to the dichotomy of *competence* versus *performance*, to the allocation of the former to *linguistics* proper, and of the latter to *paralinguistics*. At the core of such a grammar is a syntactic component, containing a base that generates deep structures, which are in turn mapped by rules into surface
structures. There are, furthermore, two interpretative components, a semantic component, which provides a semantic interpretation for the base, and a phonological component, which gives a phonetic interpretation to the surface structures. These interpretative components link meaning to sound via the abstract formal device. Only propositional meaning enters such a grammar. As regards the phonetic interpretation, Chomsky & Halle (1968) say:

> These perceptual facts may be of interest only to the extent that they provide data for testing empirical hypotheses such as the principle of the transformational cycle. Accordingly, perceived stress contours are of very great linguistic interest since they offer evidence bearing upon this hypothesis, whereas degree of aspiration will be of no linguistic interest if, as one might suspect, it is determined by principles of little depth or generality. (p. 27)

… linguists … are primarily concerned with the structure of language rather than with the acoustics and physiology of speech. It is because of this question that many structural linguists have felt that phonetics has very little to offer and have therefore assigned it to a secondary, peripheral role. (p. 293)

This view epitomizes the phonetics – phonology dichotomy and denies phonetics a place in the linguistic Pantheon. So, it was only logical for Morris Halle, at first, to refuse Janet Pierrehumbert supervision of a thesis on intonation, because he did not consider the analysis of the sound – meaning relation of intonation a proper linguistic topic, relegating the semantic aspect to paralinguistics and the phonetic aspect to a phonologically uninteresting place in a grammar of language. But she persevered, and her PhD thesis (Pierrehumbert 1980) laid the foundation for intonational phonology as a recognised component in Generative Grammar. In Goldsmith’s (1976) autosegmental approach to phonology, Chomsky and Halle’s (1968) rule-based linear generative phonology had already been superseded by a framework that takes account of other elements besides distinctive features of segments (syllable structure, stress, tone), to optimize well-formedness on separate tiers. With the development of metrical phonology (Liberman 1975, Liberman & Prince 1977), Pierrehumbert’s framework of pitch accents, phrase accents and boundary tones amalgamated to the new phonological component *Autosegmental Metrical Phonology* in Generative Grammar.
The Cartesian mental approach to language has, of course, stayed as the central tenet of Universal Grammar. As long as phonological analysis was based on descriptive desk work with phonetic transcriptions, the investigator could rely on the native speaker’s intuition rather than observation to get through to the abstract categories that underly phonetic performance in production and perception. However, the paradigm of Laboratory Phonology introduced the measurement of acoustic, articulatory and physiological variables of actual speech activity as a central aspect of AM phonology. At this point, a serious epistemological problem arose in the Cartesian frame of Generative Grammar: How can abstract mental categories be obtained, and related to measurements of physical performance variables as underlying them? One simple, common answer is that the investigator postulates underlying phonological categories as given (e.g. the decomposition of global pitch contours into sequences of specific contrastive pitch accents, phrase accents and boundary tones, conceptualized as constraints on combinations of L, H, *, %), and maps them onto physical manifestations of utterances in the language under investigation, usually in the domains of spectrographic and f0 analyses. From inferential statistical tests of the measurement data the investigator then concludes that the postulated categories have certain sets of physical exponents, especially f0 points and their alignments with the segmental structure of the words contained in the data.

If this category – substance mapping is not considered adequate the underlying categories may be patched up post hoc, e.g. by relaxing the constraints on primitives, as was done by Grice (1995), who allowed more than two tones in a single pitch accent in order to account for distinctive pitch phenomena in English. This is an instance of circular argumentation because the empirical data trigger the expansion of the categorical repertoire, but, in reverse, the revised underlying representation is supposed to provide an explanatorily adequate account of the same empirical data. Moreover, in such an approach, underlying categories are no longer falsifiable since they
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are adjustable in an ad hoc way to meet empirical findings, instead of being set up, in true scientific procedure, by considerations that lie outside the data they are to provide a theoretical framework for. Theoretical adjustments of this kind have resulted in many offshoots of classical AM Phonology, which their proponents refer to as non-classical and cite to counter criticisms of the established AM framework. They forget, however, that the basic assumptions of AM Phonology have not changed in spite of these theoretical modifications.

By placing the form of mental language competence at the centre of linguistic investigation, and relating sound to propositional meaning, AM attributes a peripheral role to function of speech performance in communicative interaction and neglects attitudinal meaning, directed towards the receiver, and expressive meaning, embodying the sender. On the other hand, when a network of communicative functions, such as ‘finality in argumentation’, ‘openness in argumentation’, ‘unexpectedness in argumentation’, is taken as the starting point for a theoretical framework of speech communication and related to perceivable global peak and valley pitch patterns and their physical exponents of f0, intensity and phonation time courses, as well as to their synchronizations with the vocal tract dynamics (Kohler 2006, 2009b), then the prosodic representations of speech utterances will not only look quite different from the underlying forms of AM Phonology but will at the same time provide a more adequate account of speech as it unfolds in communicative interaction, e.g. in spontaneous speech corpora.

In addition, AM Phonology sees linguistic form as being organised discretely, which means that speakers produce linguistic units with clear, fixed category boundaries between them, and listeners perceive them categorically. This categoricalness is the essence of word phonology, in general and within Generative Grammar in particular, and has been extrapolated to the AM level. Since such discreteness cannot be found in the physical analysis of speech, a dichotomy is established between discrete phonology
and scalar phonetics, which in turn creates the need for an interface that converts phonological categories into continuous scales in production and vice versa in perception. This interface has become the paradigm of Laboratory Phonology, inferential statistics doing the work of bridging phonetic scales and phonological categories. Other forms of meaning than propositional meaning are relegated to paralinguistics where graded manifestations are taken for granted.

There is clearly a need for a framework in the analysis of prosody that is defined in speech communication science, rather than in the more narrow field of formal linguistics. It can take its point of departure from a long tradition in linguistics before the advent of Generative Grammar and AM (cf. 1.2). The objective of investigation is the transmission of meaning by speech between communicators in social interaction in different languages (MacNeilage 2008). Thus, meaning and communicative function must constitute the core level to which linguistic form and phonetic substance are linked, and meaning embraces all fields of semantics, propositional, appellative and expressive meaning, related to the outside world, to the receiver and to the sender, respectively, in a sociocultural communication setting (Bühler 1934). The central sense – sound relationship in this speech communication framework entails all types of meaning at all times and does not presuppose speech categories with discrete boundaries: the essential requirement in speech communication is the allocation of speech stimuli to categories, with substantial overlaps, not categorical production and perception in the Haskins sense of clear fixed parameter boundaries, with sharp differentiation across them and weak differentiation inside them.

Prosody is particularly far removed from discreteness. Thus, shifting a valley contour through the environment of an accented syllable in German is perceived as a clear change of functional category, but the discrimination of neighbouring stimuli along this continuum does not change, whereas in a corresponding peak contour shift it is not only the identification of the func-
tional category that changes but stimulus discrimination also reaches a maximum at a certain f0 synchronization point with the vocal tract dynamics (Niebuhr and Kohler 2004). This shows that discreteness is a very special case that requires further converging factors, whereas category allocation applies to speech generally. So, the postulate of an indirect relationship of phonetic substance to meaning via discrete phonological form bars prosodic analysis from essential insights.

1.1.2 AM as the dependent of syntax

In the more recent adaptations of Generative Grammar, syntax continues to be regarded as the core component. So, phonological analysis is required to capture the underlying categories that interpret syntactic structures to mediate the sound–sense link. It is thus consistent that early investigations looked at prosodic features as a means to disambiguate different syntactic structures (e.g., Price, Ostendorf, Shattuck-Hufnagel, and Fong 1991). Prosodic structure is mapped to syntax, which is thus primary. The prosodic manifestation is determined by this prime, and when other factors are recognised, e.g. in prosodic versus syntactic phrasing, the divergence is formalized as a warping of syntactic structure by prosodic optimality considerations, for example by the rhythmic avoidance of stress clash (Prieto 2005), rather than by two parallel strands, where performance factors shape speech output independently of syntactic structure with varying weights given to each depending on the communicative function. However, Féry (this volume) maintains a strict and general dependence of prosodic phrasing on syntax.

The syntactic component of Generative Grammar has also been enriched by aspects of information structure – focus, topic(alization), contrastive focus/topic, and even by considerations of discourse strategies (d’Imperio, this volume). But it still is, and in this mental framework has to be, centred on propositional meaning.
In a speech communication science approach, on the other hand, prosodic analysis needs to be independent of, but parallel to, a syntactic component. With reference to the topic of the Workshop, the central question is: How do speakers structure the temporal flow of sound for listeners? To achieve this, there are syntactic and lexical means, and a whole spectrum of prosodic features as well as non-verbal sound events (lip and tongue smacks, breathing in and out, hesitation particles etc.); and these means may work synergistically together, or independently of, or even against, one another. A successful answer to this communicative question requires that a network of communicative functions becomes the point of departure. We need to define its components and analyse their segmental, prosodic and formal exponents with techniques of descriptive auditory and measuring signal phonetics applied to data sets that have been collected in plausible communicative frames of spontaneous or simulated interaction.

1.1.3 “Colorless green ideas sleep furiously.”

Chomsky (1957) pointed out that a sentence such as

(1) Colorless green ideas sleep furiously.

although semantically odd, is perfectly grammatical in English, whereas

(2) Furiously sleep ideas green colorless.

is not. Therefore, the formal syntactic component of a Generative Grammar, needs to show why this is so by explicating the syntactic well-formedness and its independence of semantic plausibility, in line with its supposedly greater explanatory power in Universal Grammar.

Playing phonetic and semantic games has a long tradition in experimenting with language and speech. What is new in Generative Grammar is its metalinguistic use to prove a theoretical point. On the other hand, nursery rhymes, children’s verses, as well as poetry and prose for children, such as Lewis Carroll’s “Alice’s Adventures in Wonderland” and “Through the Looking Glass” and Joanna Rowling’s Harry Potter books play with sound and
meaning to stimulate the imagination in one kind of communicative function.

An example of phonetic play is Jabberwocky in “Through the Looking Glass”

(3) ‘Twas brillig, and the slithy toves
Did gyre and gimble in the wabe;
All mimsy were the borogroves,
And the mome raths outgrave.

Or counting-out verses

(4) English: Ee nie meenie mo
   German: Ene mene mu
   French: Ams tram gram

An example of semantic play is the following German children’s verse

revelling in rational contradictions:

(5) Dunkel war’s, der Mond schien helle,
    Schnee lag auf der grünen Flur,
    als ein Wagen blitzeschnelle
    langsam um die Ecke fuhr.

The same semantic play is picked up in “Tweedledum and Tweedlee” in

“Through the Looking Glass”:

(6) The sun was shining on the sea,
    Shining with all its might; …
    And this was odd, because it was
    The middle of the night.

or in The Lobster Quadrille in “Alice’s Adventures in Wonderland”:

(7) “Will you walk a little faster?” said the whiting to the snail.
    “There’s a porpoise close behind us, and he’s treading on my tail.
    See how eagerly the lobsters and the turtles all advance.
    They are waiting on the shingle – will you come and join the dance?”

Such communicative play in metre and rhyme contrasts with the

metalinguistic use of nonsense sentences in data acquisition procedures that

have been developed for prosodic analysis in the wake of Generative

Grammar, dissociating language form from function in communication. In

the 1980’s, Robert Bannert, at Lund at the time, collected production data of

phrase accents in German using the constructed sentence

(8) Der lullende Müller in Lingen will die längeren Männer in der Menge
    immer längernde Lümmel nennen.
    “The peeing miller from Lingen will always call the longer men in the
crowd lay-about rascals.” (Bannert 1983)
reminiscent of Bruce’s (1977)

(9) man vill lämna nåra långa nunnor
    “one wants to leave some long nuns”

This metalinguistic practice is still continued a quarter-century later:

(10) Die Nonne und der Lehrer wollen der Lola in Murnau eine Warnung geben, und die Hanne will im November ein Lama malen.
    “The nun and the teacher want to give a warning to Lola from Murnau, and Hanna wants to paint a lama in November” (Truckenbrodt 2002)
    or quite recently

(11) {The sheep wanted to introduce the buck to the lion. Why didn’t he do it?}
    Weil der Hammel den Rammler dem Hummer vorgestellt hat.
    “Because the sheep introduced the buck to the lobster” (Féry & Kügler 2008).

The reasons for this methodology are as clear as they are questionable. On the one hand, the fixation of Generative Grammar on cognitive linguistic form instead of communicative function provides the theoretical basis. On the other hand, the analysis method, which is to guarantee the tracing of continuous f0 contours through voiced sonorants (vowels, laterals, nasals), determines the speech material, rather than vice versa. The acoustic manifestation of speech prosody in general, and of prosodic phrasing in particular, depends significantly on performance factors. It is therefore impossible to capture an “underlying prosodic form” through the signal analysis of recorded data. And what is more, data acquisition methods that provide no situational contextualization in communicative function, but require subjects to read off sentences in a conveyor-belt fashion, introduce performance artefacts. They are most serious in prosodic phrasing and in the relative weighting of information elements, which hampers extrapolation to real functional settings and to the language as such. For example, in the situationally detached and therefore communicatively implausible phrasing “weil der Hammel den Rammler dem Hummer vorgestellt hat”, the reader has to concentrate on the articulation of highly similar syllable sequences to avoid slips of the tongue, thus affecting the weighting of its elements and consequently the expressed information structure. So,
the data acquisition methodology reduces the validity of such measurements for the goal of Generative Grammar, and for AM in particular, still further.

1.1.4 Do all native speakers of a language variety speak with one tongue?

The focussing on the formal cognitive units of a language, rather than on the communicative functions in speech interaction has yet another infelicitous methodological consequence. Any native speaker of a language variety under investigation is considered a potential source for analysis, e.g., of the type discussed in 1.1.3. They are all supposed to speak with one tongue. So, subjects do not need any screening as to their language proficiency and their aptitude for the task. They are recruited as they become available and are willing to do the task. But there is no denying the fact that there are good and bad native speakers as regards articulatory, rhythmical, prosodic and semantic structuring of speech, and their power of imagination in the sense – sound coding under laboratory conditions. Analysing a generally small sample of a population of speakers indiscriminately will result in fuzzy data sets of limited value, even as regards observational adequacy, let alone explanatory adequacy, the ultimate goal of Generative Grammar and AM.

1.1.5 AM has English as the point of reference

AM in Generative Grammar has become a school paradigm, which is nothing new in linguistics; it happened in historical linguistics of the Neogrammarians, in American Structuralism, and in the Prague School. But what is new is its development on the basis of English and the subsequent transfer of its categories to other languages, without always ascertaining whether the categories are appropriate outside English. The transfer is in part effected by Anglophone scientists who have no high-level proficiency in the oral use of the other languages (and may even maintain that it is irrelevant for making linguistic statements), or by non-native speakers of English, who take the transfer to their native languages for granted because it fits the paradigm,
and who use English as a lingua franca for the world-wide distribution of their work on their own languages.

The whole field of accentuation within AM, with the categories *stress, stress clash, pitch accent*, has English as its yardstick. It may be mapped onto the other West Germanic languages – High and Low German and Dutch, and probably also Frisian – in a straightforward way because this language group has very similar accentuation structures in lexical stress, sentence accent, and rhythm (Kohler 2008). But this transfer does not work for French, which has no lexical stress, and no pitch accents as markers of rhythmic feet, and uses pitch to signal phrasing units, rather than sentence accentuation (Vaissière 1992, 2002, Vaissière & Michaud 2006). Yet, Jun & Fougeron (2002) shape the description of French prosody in terms of the AM categories *stress* and *pitch accent* in accentual phrases. In a footnote (p. 151), they differentiate their use of the term *pitch accent* for French from the term’s use for English. So, they use the same term for something they consider different in the two languages but at the same time equivalent because the H* part of an LH* tone “is associated with the stressed syllable at the phrasal level”. Thus the definition of a French *pitch accent* (difference from English) qua AM *pitch accent* (category equivalence) rests on the *stress* category, also left undefined for French (it certainly is not English *lexical stress*, but rather perceptual *prominence*), and on the presence of an H. This is opaque scientific terminology, which cannot do justice to the prosodic structures of French compared with English (cf. 2.2.1). It is the result of trying to inculcate an English-based prosodic paradigm on a language that is structured quite differently.

1.2 *Prosodic phrasing in a framework of communicative phonetic science*

The following are essential axioms in a theoretical reorientation (cf 1.1.1) for an insightful comparison of prosodic phrasing in Romance and Germanic in a framework of *speech communication science*. 
1. Communicative function is at the centre, and the goal of the investigation is the sense – sound relationship in situations of communicative interchange between speakers and listeners. This includes all types of communicative functions – propositional, appellative and expressive – at all times, with varying degrees of each, depending on the situation. These functions form a network that on the one hand applies to communication in any language, and is, on the other hand, language-specific.

2. This functional perspective determines the data acquisition procedures as regards the contextualization of language material in semi-spontaneous or simulated speech situations as well as the selection and screening of subjects.

3. The flow of sound is syntagmatically organized, not just in linear chunking, but also in relational structuring.

4. In this syntagmatic organization, formal syntactic means and prosody work in parallel, the latter is thus given an independent status: it can highlight the former but it also operates in direct relation to the communicative functions evolving in speech interaction.

5. The prosodic categories applied to the data analysis need to be worked out separately for each language against a background of the functional network or the part thereof that is relevant for the discourse setting. And before any measurements are taken of data sets the categories need to be established auditorily by trained observers.

6. Syntagmatic organization of speech through prosody takes two forms, coding of meaning, and coding of rhythm, with interactions between them.

This theoretical stance is akin to scholars, such as Bolinger (1986), Bühler (1934), Coseriu (1973), Firth (1957), Fónagy (1983, 2001), Gardiner (1932), Malinowski (1946), Wegener (1885), and to the rich European linguistic tradition in the analysis of speech communication in general, and of intonation and rhythm in particular (Classe 1939, Lehiste 1979), before Generative Grammar, AM, and Laboratory Phonology.
This paper discusses the exponents of prosodic phrasing in the two coding functions as well as their interactions, with examples from the West Germanic languages English and German in comparison with French. Section 2 deals with the first function – substance relation. It is opened with a facetious interpretation of a record of military history, putting it in a functional sense – sound context to explain different syntagmatic structurings of the same sequence of words in French and English, with diametrically opposed meanings. The example also serves to illustrate that different syntagmatic prosodic organizations go beyond the mere linear chunking into units with discrete boundary markers, but involve relational structures between the units encompassed in long prosodic components. This is followed by a discussion of corresponding patterns of syntax-related phrasing in the three languages, which again illustrate relational structures beyond chunking. Finally, the graded weighting of prosodic feature bundles is related to the hierarchical structuring of information in spontaneous speech. Section 3 then deals with prosodic phrasing in the coding of rhythm, Section 4 with the interactions between the two phrasing functions. Whereas all three languages are very similar in their meaning-related prosodic phrasing, French diverges considerably from the Germanic languages in rhythmic organization.²

2. The coding of meaning through prosodic phrasing

2.1 Reconstructing an historical event with prosodic phrasing

On 11ᵗʰ May, 1745, a fierce battle took place near the small hamlet of Fontenoy, in what is now Belgium, between the Allied Anglo-Hanoverian, Dutch and Austrian army under the command of the Duke of Cumberland, and the French army under Maréchal Saxe. The French won. These are the facts. Now come the legends, which differ on the two sides of the Channel.
The French version says that the commanding officer of Les Gardes Françaises advanced towards the English line, took off his hat, and called:

(12) Messieurs les Anglais, tirez les premiers.  
Un bon exemple de la galanterie française.  
“Après vous, je vous en prie.”

The English version says that the English commanding officer advanced towards the French line, took off his hat, and issued the opposite invitation. Which language did he do it in? In French, the language of European diplomacy and culture at the time

(13) Messieurs les Français, tirez les premiers.
with a heavy English accent? Or in English

(14) The French gentlemen have the first shot.
In either case, it is reported as an example of English polite sociability “We must give the chaps a chance.”

Both versions are, of course, highly improbable because the English would most likely not have understood French, nor the French Franglais or English. But as pointed out by Daninos (1954: 74), there may be a straightforward explanation of the legend in the atmospheric conditions of a French locality so close to the English Channel: “dans le nord, où il y a de la pluie et du brouillard tout anglais”, the commanding French officer may suddenly have seen the English soldiers emerging from the fog and shouted to Les Gardes Françaises

(15) Messieurs! … Les Anglais! … Tirez les premiers!

So, in this reading, the legendary French utterance at the Battle of Fontenoy is not a listener address to the English, followed by an invitation to act (Function 1: address + invitation in social interaction), but a listener appeal to the French, followed by an admonition of the advancing enemy, which is in turn followed by a command, and the whole utterance expresses serious concern over a negative, life-threatening experience (Function 2: appeal + admonition + command in adverse situation). Functions 1 and 2 differ prosodically in the following respects.
1. In Function 1, the most likely realization is in two prosodic phrases, corresponding to address and invitation, the former on rising pitch, ending in a continuation rise on “Anglais”, the latter with rising-falling pitch and the turning point somewhere on “les pre-“. There is substantial lengthening of the final syllable in each prosodic phrase, with a possible pause at the end of the first one. The phonation in the vocalic sections throughout the utterance is of the modal type. In a more careful and deliberate enunciation, the first prosodic phrase may be subdivided into two continuation rises, “Messieurs” and “les Anglais”, with a minor division between them, signalled by a lower rise and less final lengthening.

2. In Function 2, on the other hand, the realization must be in three prosodic phrases, corresponding to appeal, admonition and command. In each, the pitch is falling on the last syllable, and there is substantial lengthening of the final syllable, which may be followed by a pause. In the third prosodic phrase, an accent d’insistance is to be expected on the first syllable of ‘tirez’, with lengthening of the voiceless initial consonant and a high pitch on the vowel, then falling continuously across the remaining prosodic phrase. Furthermore, there is pressed breathy phonation and a high energy level running through the whole utterance. All these features converge to create the impression of shouting and of negative intensification, i.e. an emphatic accentuation for the expression of negative experience (Kohler & Niebuhr 2007).

3. So, it is not just the number and strength of break indices and phonetic properties at the phrasal boundaries that differentiate the syntagmatic prosodic phrasings for Functions 1 and 2, but also the internal make-up of the phrases.

4. Without the pressed phonation and intensification features, the utterance would not be decodable as intended, even if it is broken up into three prosodic phrases; it would still convey the invitation to act, even with falling pitch.

The reinterpretation of the Legend of Fontenoy is an analysis in the framework of communicative phonetic science. It does not start from formal syntactic structures of vocative + (elliptic phrase +) imperative construction,
to which are linked formal AM phonological categories of pitch and phrase accents, boundary tones, and break indices, substantiated by phonetic measurement. Instead, it starts from communicative functions of listener address + invitation to act, or of listener appeal + admonition + command in the context of negative intensification, and it looks at the ways they are coded by bundles of sound properties, not just at phrase boundaries but throughout the phrases.

But the historical riddle of the Battle of Fontenoy remains because we can get the same type of function-triggered prosodic structuring in English, this time with the ordering admonition + listener appeal + command

(16) The French! ... Gentlemen! ... Have the first shot!

Here the difference between Functions 1 and 2 is effected by the former having one prosodic phrase with a foot structure The | French | gentlemen | have the | first | shot. (cf. section 3.) and rising-falling pitch peak contours in each foot, whereas Function 2 has three prosodic phrases with peak contours at the stressed syllables in each of them. Again the pressed breathy phonation and raised energy level are essential to get Function 2 across. Without it, a three-phrase utterance, in spite of the other prosodic features, becomes meaningless.

The foregoing prosodic discussion still has to leave the legend of the Battle of Fontenoy to the historians to solve, but it provided an entertaining frame to make four points about research into prosodic phrasing in different languages: (1) The analysis of syntagmatic prosodic structuring of the flow of sound and words into successive chunks can only give interesting and explanatory insights into the working of speech interaction between speakers and listeners, if it is seen in relation to communicative functions in contexts of situation. (2) Prosodic phrasing can be independent of syntactic structure, which is thus not an interlevel between function and prosody, but is related to function in parallel with the phonetic level. (3) Neither the number of such phrasing units nor the phonetic properties at their boundaries – f0, duration, energy, phonation types, vocal tract dynamics – give a comprehensive account of the sense – sound relationship in phrasing; the phonetic manifestations inside the
phrases, such as long-term voice quality, are equally important to get the proper communicative functions associated with the phrasal structuring across to a listener. (4) Structurally quite different languages, such as French versus the Germanic languages, show striking similarities in such function – prosody links, even if the details of feature bundlings may diverge.

2.2 Syntax-related prosodic phrasing

Although syntax is not to be taken as an interlevel between meaning and prosody that determines prosodic structuring, there is nevertheless a significant section of prosodic phrasing phenomena that show parallelism between prosody and syntax for the expression of functions, such that prosodic phrasing converges with syntactic structures to transmit the syntagmatic organization of elements of speech to a listener. This applies to the level of words, of phrases and of sentences.

2.2.1 Prosodic phrasing to differentiate words, compounds and constructions

In English and German, single and double, primary and secondary lexical stresses differentiate simplex and compound words, and syntagmas:

(17) **English** (Kingdon 1965: §70; §50)

'buttercup (flower), 'butter ,cup (butter dish), 'butter 'icing
'moving ,van (removal van), 'moving 'van (van in motion)
'stone'blind (_'cold, _'dead, _'deaf), 'dirt'cheap [double stress: the first word intensifies the meaning of the second]

**German** (Kohler 1995:114ff; 186ff)

'Rücksicht (“consideration”), 'Rück,sicht (“view to the back”)
'blut,arm (“anaemic”), 'blut'arm – 'stein'reich (“very poor/ rich”)

[double stress: the first word intensifies the meaning of the second, as in English]

Thus, in the West Germanic languages, lexical stresses mark low-level syntagmatic structures, binding syllables in words, words in compounds and in syntactic constructions. Lexical stress indexes a specific syllable of a word that receives physical manifestations of accentuation when the word is ac-
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cented in an utterance – lengthening, falling/rising f0 movement, increased energy, more peripheral vowel qualities. The lexical stress position is stable, although there may be differences between varieties of English or German, and stress patterns may be restructured for rhythmical reasons.3

The situation is different in French because it has no lexical stress. So, the propositional highlighting of words in utterances by docking features of accentuation at lexical stress positions, as in the Germanic languages, does not exist either. This, in turn, means that the AM category of pitch accent is not appropriate for the analysis of French prosody (cf. 1.1.5). There is an accent category in French for emphasizing the meaning of words, an accent d’insistance. It manifests itself on the first syllable of a word that begins with a consonant, including a glottal stop to initiate a word-initial vowel, by increased duration of this consonant and increased f0 and energy of the vowel (Grammont 1934: 139ff). A similar accent of emphasis occurs in the Germanic languages, related to positive and negative intensification, i.e. expressive meaning (Kohler & Niebuhr 2007), and has therefore played an ancillary role in AM. All other phenomena of perceptual salience of syllables in French have nothing to do with accentuation of the Germanic type and should consequently be named differently. The term that obviously captures the phenomenon is prominence (Kohler 2008).

The syntagmatic structuring of utterances in French is not based on accentual units that make up prosodic phrases, but on a hierarchy of phrasal units from small to large, from the mot phonétique to minor and major prosodic phrases and to the sentence (Vaissière 2002, Vaissière & Michaud 2006). It is the final, non-schwa syllable in such phrases that is made more prominent than the others in the same phrasal unit, by lengthening and by f0 continuation rises or f0 falls. The degree of lengthening and the extent of the rise and the终端ity of the fall depend on the strength of the syntagmatic division. This phrasal hierarchization by duration and pitch movements
starts at the level of the word (i.e. the *mot phonétique*), where in the Germanic languages lexical stress achieves the grouping. So, in

(18) **bor'dures** ("rims") – bords 'durs ("hard edges")

both have lengthening of the last syllable, but the noun-adjective construction may receive an additional phrasal division with lengthening of the first syllable, thus distinguishing it from the simplex noun. However, if the construction is pronounced with a short first syllable it is ambiguous. This reveals another characteristic feature of syntagmatic structuring in French: content and function words are integrated into *mots phonétiques*, in which their phonetic identity across their boundaries is lost, and the last non-schwa syllable receives increased prominence. Since the phrasal juncture is marked by lengthening, *l'E caduc* is not deleted on the approach to it. This means that in compounds such as ‘porte-clés’ ("keyring"), ‘porte-manteau’ ("coat-hanger"), [ə] is maintained in the former before the prominent syllable, but is dropped in the latter (Léon 1966). [ə] is, therefore, not a “phoneme” in French but an aspect of prosodic phrasing, which is in turn also a stylistic phenomenon (cf. 2.3).

2.2.2 **Prosodic phrasing to differentiate syntactic surface structures**

The most elementary use of prosodic phrasing is linear bracketing of the acoustic flow of syllables and words in alignment with surface syntactic structures, as illustrated in the following examples (*PG* = prosodic grouping).

(19) **English** (Price et al. 1991)
   (a) Wherever you are (,PG) in Romania or Bulgaria (,)PG remember me.
   (b) I read a review of nasality PG in German.
       I read a review PG of nasality in German.
   (c) Mary (,PG) Jane and Alice

(20) **German** (adapted translations of the English examples)
   (a) Wo du auch bist (,PG) in Rumänien oder Bulgarien (,)PG denk an mich.
   (b) Dies ist ein Bericht über neuere Publikationen PG auf Deutsch.
       Dies ist ein Bericht PG über neuere Publikationen auf Deutsch.
   (c) Hermann (, PG) Josef PG und Walter
(d) Der brave Mann denkt an sich (PG) selbst zuletzt.

(Schiller, Wilhelm Tell) “A good man thinks of himself last/even in the end.”

All these pairs are distinguished by integrating the words into one or two global pitch contours (rising-falling, falling, or rising), with non-obligatory additional final lengthening and an optional pause before the break. In (21) (d), the different pitch groupings are also accompanied by differences in sentence accentuation, ‘sich’ being accented at the prosodic phrasing boundary, but unaccented in the single pitch arch. In (20) (c), (21) (c), there is either a single rising pitch pattern for the double first name of one person, or two separate ones for the first names of two persons. This coincides with a single accent on the second name, or one accent on each name. (20) (b), (21) (b) have weaker PGs, their realization is less stable and subject to performance factors (cf. 2.3).

The general pattern is the same in

(21) **French** (Fónagy 2003: 4; Vaissière & Michaud 2006: 2.3f)

(a) un acteur PG du cinéma muté – un acteur du cinéma PG muté
une tasse PG de thé russe – une tasse de thé PG russe
(b) Jean-Pierre PG et Jacques – Jean, PG Pierre PG et Jaques
(c) Cet homme PGs est énormément bête. – Cet homme PGw est énorme
PGs et m’embête. (s = strong, w = weak PG)

However, the prosodic manifestations are different from the Germanic data. The pitch pattern on the prosodic phrases is typically rising, to mark continuation, except for a falling terminal one. The stronger a prosodic phrase marker, the higher the pitch end point and the greater the final lengthening. Lengthening is the prime cue to prosodic phrasing in French. Strong boundaries may again be highlighted by an optional pause. Example (c) illustrates French prosodic bracketing of syllables into *mots phonétiques*, with obliteration of individual word identity. They, in turn, enter into higher-order prosodic phrases, where stylistic performance factors determine their manifestation. In the Germanic languages, the grouping concerns words, which, outside the function word class, maintain a high degree of boundary stability. Thus, French lends itself to extensive ambiguous word play (*calembours*). If word boundaries are
marked in French (2.2.1), they are part of the total hierarchy of prosodic phrasing with lengthening as the main exponent, differing from juncture phenomena of lexical phonology in English, such as ‘night rate’ vs. ‘nitrate’ (Lehiste 1960).

2.2.3 Prosodic phrasing for semantic structuring

The main function of prosodic phrasing is the organization of meaning, which goes beyond the linear suprasegmental bracketing of formal surface structures. Although the different word orders in the following German examples distinguish different structural relations of negation, the English translations show that prosody can take over the grouping function.

(22) (a) Ich gehe wegen der 'Kinder nicht nach Amerika.
        “I’m 'not going to A'merica, PG because of the 'children.”
    (b) Ich gehe nicht wegen der 'Kinder nach Amerika.
        “I’m 'not going to A'merica because of the 'children.”

The negation particle ‘nicht’ either modifies the verbal phrase, and is then put before the prepositional phrase of direction, meaning “the children are the reason for not going to America.” Or it modifies the causal phrase, and then precedes it, meaning “the children are not the reason for going to America.” In either case, a possible realization (among several others) has only one sentence accent on ‘Kinder’ and a rising-falling pitch contour centred on the stressed syllable of the accented word, which puts the causal phrase with its positive or negative truth value in focus. The two meanings are carried by different syntactic structures, which are put under an identical prosodic umbrella. In English, the same distinction can be achieved by cleft sentence constructions in a 4-fold frame of truth values for cause and action: “It’s (not) because of the children that I am (not) going to America.” This also applies to French: “C’est à cause des enfants que je ne vais pas en Amérique. / Ce n’est pas à cause des enfants que je vais en Amérique.” In all these cases, syntactic means are used to give propositional weight to the truth value of the cause and the action.

However, in English the negation particle may also stay in the same place, and its different references be conveyed by prosodic patterns: (a) 2 pro-
sodic phrases with rising-falling pitch patterns, for the negated action and for its reason, and with additional optional marking of the boundary by final lengthening and by a pause, (b) 1 prosodic phrase with a falling-rising pitch pattern: a gradual downstep on the accented words and a nuclear fall-rise on ‘children’. (Schubiger 1958: 92ff). This syntax-prosody bracketing is also possible in German and in French:

(23)  (a) Ich gehe nicht nach A’merika, PG wegen der ’Kinder.
       Je ne vais pas en Amérique, PG à cause des enfants.
       (b) Ich gehe nicht nach A’merika wegen der ’Kinder.
       Je ne vais pas en Amérique à cause des enfants.

But in German, the nuclear accent in (b) is a late rising-falling peak contour. In French, (a) has continuously rising pitch to a high level before PG, strong lengthening of ‘-rique’ and an optional pause, then followed by a (rising-) falling pitch pattern; in (b), on the other hand, the initial part rises less high and has less lengthening, and is followed by a rising(-falling) pattern that reaches its higher peak on the first or second syllable of ‘enfant’. In all three languages, examples (a) highlight the propositional validity of the cause, signalled by PG, whereas in (b), intonational phrasing also introduces an attitudinal meaning, such as contrast to what the listener has suggested or might assume.

If in (22) (a) ‘Amerika’ is also accented with a nuclear fall, the negated action receives informational weight as well, and the prosodic grouping and highlighting coincide with the syntactic grouping of the sentence negation and the action complement of direction. The semantic interpretation of the negation remains the same as in the single-accent case. However, if the same accent and pitch patterns are introduced into (22) (b) the syntactic and prosodic structures diverge: the syntactic structure groups the negation with the causal phrase, but the prosodic structure focuses the action complement. This clash results in negativity spilling over into the section that is highlighted prosodically: “for me to go to America needs stronger reasons than the children wanting it, or profiting from it linguistically etc., so, it is open whether I will go”.4
These examples show that prosodic phrasing is independent of syntax, that they both contribute separately to the transmission of meaning, converging or diverging in this process, and that if they clash, prosody shapes the final semantic outcome. So, the goal of speech communication is the (de)coding of semantic structures at parallel levels of syntactic form and prosodic substance.

The semantic organization of negation and cause either in two prosodic phrases or integrated into one is a common pattern in English and German. (Schubiger 1958). Fónagy (2003: 5) quotes the following examples for French:

(24) Je ne suis pas venu (PG) parce que j’étais malade.
    “I did not come (PG) because I was ill.”
Il n’est pas venu (PG) par ambition.
    “He did not come (PG) out of ambition.

(Pitch patterns as in (23).)

A more subtle German example is the following from a political election advertisement for the Social Democratic Party at the Schleswig-Holstein parliamentary election of 1983, published in the local newspaper “Kieler Nachrichten” on 12 March, 1983. This election followed an election for the Federal Parliament one week earlier, where the Green Party gained a considerable increase of votes. So, the Social Democrats, to prevent the same happening again at their expense, addressed the electorate as follows.

(25) … und ich bitte alle Wähler, die am letzten Sonntag grün gewählt haben, ihre Stimme morgen nicht zu verschenken PG und SPD zu wählen.
    “… and I ask all voters who voted green last Sunday not to waste their votes, PG and vote SPD.”

The PG is essential here to create two pitch envelopes for two requests: (1) “don’t waste votes”, (2) “vote SPD”. However, the absence of a PG and the integration into one pitch envelope signals one request and a justification for it: “don’t waste votes by voting SPD”. The same patterns and meanings come out in the English translations.

There are other relations of informational units that are also carried by prosodic phrasing. Restrictive and non-restrictive relative clauses provide a further case of one pitch envelope versus two, to mark one sub-specified information unit as against two added information units.
(26) That’s from my brother (PG) who lives in Paris. (Schubiger: 103)
Das ist von meinem Bruder, (PG) der in Paris lebt.
Ça vient de mon frère, (PG) qui vit à Paris.

Then, there is the syntagmatic structure where one or two pitch envelopes change a temporal reference point and the syntactic categorization from subordinate to principal clause (cum inversum of Latin grammar).

(27a) We had 'hardly left the 'house \ when it began to 'rain /
The temporal clause with the low-rising pitch marks the point in time which the action in the main clause with its falling pitch is referred to. The falling + low rising pitch envelope groups the words into one prosodic phrase. In

(27b) We had 'hardly left the 'house \ (or \/,PG when it began to 'rain \ the main clause marks the reference point in time for the event in the subsidiary clause: “at this point it began to rain“ (Schubiger 1958: 94) Cf. also the German translations and French equivalents as well as further examples:

(27c) Wir hatten 'kaum das 'Haus verlassen, als es zu 'regnen \ anfing.
Wir hatten 'kaum das 'Haus \ verlassen, PG ...
Nous étions au jardin (PG) lorsque l’orage éclata. (Bally: 87)
I was thirteen (PG) when my mother died. (Schubiger: 94)
Ich war dreizehn (PG) als meine Mutter starb.
J’avais treize ans (PG) quand ma mère mourut.

Again the French examples differ from the English and German ones by PG being marked with a high-rising pitch contour and substantial lengthening, whereas in the absence of PG, there is a rising-falling pattern reaching its peak at the beginning of the second clause, with much less final lengthening. In the examples discussed so far, prosodic phrasing serves to mark syntagmatic meaning relations between units of information, the sender, and the receiver by pitch envelopes chunking the sound flow, supported by other features, especially final lengthening and pauses, but also voice quality and energy. In the Germanic languages, (rising-)falling pitch contours are the predominant envelope shape, whereas in French it is the rising ones. In the Germanic languages, pitch constitutes the primary phrasing feature, not just as regards its weight among the physical exponents, but also because rhythmical and focal sentence accents are integrated into the global pitch envelope. In French, on the other
hand, lengthening plays a far more important role, in marking phrase edges, as well as initial-syllable edges in the emphatic accent d’insistance, in both cases increasing their prominence. There are thus general patterns of prosodic phrasing for semantic structuring, which differ in their specific phonetic manifestations for the same goals in French as against English and German.

2.3 Prosodic phrasing in argumentation structure

The function – substance discussion in 2.2 has revealed generalizable links between syntagmatic prosodic phrasing patterns and particular semantic structures in three individual languages from the Germanic and Romance groups. Information structure has turned out to be signalled by prosodic phrasing either in congruence with syntactic structure, thereby heightening it, or quite independently in a direct function – substance link. These phrasing – meaning relations provide the language frame for the performance of speakers and listeners in speech communication. In actual communicative interaction, the phonetic manifestations of semantic structures in prosodic phrasing, as set by the language, are subject to large-scale variability, ranging from absence to very finely grained and hierarchically organized bundlings of graded properties. Through them, speakers impose their own argumentation structure on a network of outside-world information, incorporating expressive and appellative components.

A good illustration of this shaping of pieces of information by superimposing the speaker’s argumentation structure on them, including expressive and appellative functions, is CNN's station ID ‘This [pause] is CNN.’, pronounced in the deep voice of James Earl Jones, the African American actor, with pitch accents on ‘this’ (late low valley contour), on ‘is’ (late peak contour), and on the last syllable of CNN (medial peak contour with raised peak for reinforced accent). (For the pitch accent categorizations see Kohler 2006, 2009b; Niebuhr and Kohler 2004.) The deictic theme ‘this’ points to
the rheme, and the inserted pause attracts the listeners’ and viewers’ attention for the specification that is to come. This highlights the importance of ‘Cable Network News’, and the bass voice adds authoritativeness to it (Ohala 1983, 1984). The oral tagline is a wonderful example of phrasing through prosody in speech performance for communicative effect, much more subtle and far more effective than CNN’s other slogans ‘The World’s News Leader’, ‘The Best Political Team on Television’, or ‘The Most Trusted Name in News’, as it gets the same message across “between the lines” at every news update. The function of this pausing is not to impose a prosodic phrase structure on the syntactic parsing of a subject NP and a VP, but to give the informative message the announcer’s argumentative twist by pausing before an accented element, a well-known and wide-spread performance device in languages for drawing a listener’s attention to what is coming and thus highlighting its importance and its semantics.5

This argumentative shaping of information transfer by prosodic phrasing also operates across dialogue turns, where the speaker may signal ‘finality’ (“the discussion is coming to an end”) or ‘openness’ (“the discussion takes a new start”). For the prosodic expression of these communicative categories, the speaker may use ‘early’ and ‘medial peaks’, respectively (see Kohler 2006, 2009b). These categories are set by dialogue partners engaging in communication and are not identical with an external information structure of ‘given’ and ‘new’. Argumentation structure needs to be clearly differentiated conceptually from information structure to avoid serious misunderstanding. External givenness and the speaker’s argumentation may even go against each other. The following examples may illustrate this.

(28a) After a long discussion at the beginning of term about finding a suitable alternative time and day for a series of seminars to accommodate all who want to attend, the tutor says “We are going to move the seminars to Thursday.” He says it with an early peak on the last word to indicate to the audience that this is final and the discussion is now closed, although this is ‘new’ information.
The session then continues to discuss other course matters, and at the end, before departing, the tutor reminds the audience "Please remember. We have moved the seminars to Thursday." He says it with a medial peak to insist, although the information is now ‘given’.

Over and above superimposing an argumentative structure on an external-world information structure, speakers also exhibit varying degrees of delicacy in turn-internal prosodic phrasing according to their proficiency in expressing these structures orally in communicative interaction. The examples discussed below illustrate these speaker-dependent variables of argumentation structure and oral performance. They are taken from the Kiel Corpus of Spontaneous Speech (IPDS 1995-1997), which provided the basis for an extensive study of prosodic phrasing in German (Kohler, Kleber & Peters 2006, Peters 2006).

The phonetic properties of prosodic phrasing examined in these dialogue interchanges include (1) final syllabic lengthening, which disrupts speech fluency if it is above a threshold set by the speech rate, (2) low-falling, high-rising or falling-rising pitch leading up to the boundary, (3) pitch reset after it, (4) a pause or breathing, scaled in duration (5) interactional non-verbal sounds, (6) glottal stop and glottalization in sonorants. It is clear that with such multivalued feature bundles, phrase boundaries cannot be discretely present or absent but have gradient variability according to the semantic weight of phrase separation. This weight reflects the argumentation structure the speaker wants to convey in speech communication within the flexible frame of a particular language, and at the same time its phonetic exponents are an index of the speaker's rhetorical proficiency.

Phrase boundaries are first determined auditorily and then related to acoustic properties as follows:

- **PG1** the weakest break, signalled by segmental lengthening (±L) or by pitch features (±F), or by both, but no pause/breath (-P)
• PG2 signalled by segmental lengthening (±L) and/or pitch features (±F) 
  + perceptually short pause/breath (+P -l), whose evaluation depends on 
  its acoustic duration in relation to over-all speech rate and position in 
  syntactic structures
• PG3 signalled by segmental lengthening (±L) and/or pitch features (±F) 
  + perceptually long pause/breath (+P +l)
• PG4 signalled by segmental lengthening (+L) and pitch features (+F),
  either at the end of a dialogue turn (+T) or followed by a perceptually 
  long pause/breath (+P +l)
• PG1 and PG2 may need further subclassification according to the per-
  ceptual strengths of different combinations of ±L and ±F; this is an open 
  research question.

The following passage provides highly skilled prosodic phrasing for 
weighted information grouping in an appointment-making task (g212a007, 
male speaker ANL).

(29) ja, PG2 gerne. PG2 ich habe also Zeit vom Donnerstag, den zweiten 
Juni PG2 bis Mittwoch, den achten, PG3 und von Samstag, dem acht-
zehnten, PG2 bis Donnerstag, PG1 den dreund-zwanzigsten, PG3 und 
dann wieder vom siebenundzwanzigsten bis zum dreißigsten. PG4

“yes, PG2 OK. PG2 I’ve got time from Thursday, the second of June 
PG2 till Wednesday, the eighth, PG3 and from Saturday, the eighteenth, 
PG2 till Thursday, the twenty-third, PG3 and then again from the 
twenty-seventh to the thirtieth. PG4”

The dialogue turn contains 3 blocks of dates, which are separated by 
PG3; within the first 2 blocks, the speaker structures the periods of time by 
PG2 from ... to. The first block is introduced by 2 affirmative links to the pre-
ceding turn, marked by PG2. At the end of block2, the day of the week and the 
date are separated by a weaker PG1. In block3, the 2 dates of the period are 
integrated into a hat pattern with a low-falling early f0 peak contour and laryn-
gealization to signal the end of the turn.

This perfect hierarchical structuring of syntagmatic grouping, to high-
light the speaker's argumentation structure, contrasts with poor chunking in the 
following example from the same data scenario (g072a015, male speaker TIS).
(30) wo ich im Juni Zeit hätte, PG1 ich kann Ihnen das ja mal sagen, PG2 wäre PG3 Samstag den 18. bis Donnerstag den 23., PG1 und dann wie der ab PG2 Montag den 27. bis Ende des Monats. PG2 Vielleicht haben Sie da irgendwann Zeit. PG4

“when I would have time in June, PG1 I may tell you this, PG2 would be PG3 from Saturday, the eighteenth to Thursday, the twenty-third, PG1 and then again from PG2 Monday, the twenty-seventh till the end of the month. PG2 Perhaps you have got time on any one of these dates. PG4”

There is less grading of boundary strength for the mapping of the structural hierarchy in the information the speaker wants to transmit. Moreover, instances of PG2 and PG3 are located inside syntagmas, and signal dysfluencies as a result of wording problems.

The English translations with PG markings suggest the same prosody – argumentation mapping for English. Comparable large-scale analysis of spontaneous speech can provide the answer. There are, principally, the same prosodic parameters and the same types of hierarchical argumentation structuring in French. But the bundling of signal properties for the same argumentative weighting is most likely different. In particular, rising pitch patterns need the addition of lengthening in French to signal prosodic phrasing; in German, rising pitch can be sufficient. This is an empirical question which needs to be investigated with a similar database of spontaneous speech.

The foregoing discussion shows that data must not be analyzed blindly and indiscriminately but need to be screened as to the speakers’ speech proficiency before generalizing to cognitive structures in the language. Such a preliminary screening takes the form of competent native observers of a language ranking speakers or corpora collected from them on such scales as, e.g., ‘acoustic clarity/intelligibility’ and ‘content organization’, in each case from ‘bad’ to good’. The speakers are then allocated to groups according to their screening indices, and these groups are analysed separately. Such a procedure allows us to give theoretically motivated accounts of phonetic variability across speaker proficiency within the same analytical frame of reference,
without having to resort to abstractions from empirical variance to form underlying ‘the’ language.

This caveat against indiscriminate data analysis is not only valid in the prosodic coding of meaning but is even more relevant in the coding of rhythm, which is the subject of Section 3.

3. The coding of rhythm through prosodic phrasing

Although there is a good deal of similarity in the signalling of prosodic boundaries between Germanic languages and French, they diverge more strongly in the internal structuring of prosodic phrases. In English and German, the internal structure of prosodic phrases is made up of sentence accents, which manifest themselves at positions of lexical stresses by a combination of f0, duration, intensity, and spectral characteristics. Accented and following unaccented syllables are grouped into rhythmical bars (feet), which may cut across syntagmas inside phrases, and in which unaccented syllables are compressed, adding to the prominence of accented ones. There is thus a tendency towards temporal regularity of rhythmical beats linked to the phrase-internal sequence of sentence accents. In French, on the other hand, prosodic phrases are made up of groupings of syllables into mots phonétiques, in which the last non-schwa syllable is made more prominent and the non-prominent syllables, outside function words, are not compressed. So, in French, prominence is not attached to accent units which can form rhythmical feet, but to phrasing units of syllable sequences. Therefore, the intra-phrasal prominence organization follows the same principle as the inter-phrasal chunking.

French speakers speaking English or German replace the accentual structure by their own phrasal prominence patterns without syllable compression. Contrariwise, English or German speakers transfer Germanic accentuation, with compression in between prominent syllables, into French. This is
also characteristic of ‘l’accent alsacien’. On the one hand, this disturbs the intra-phrasal prosodic structure, and on the other hand, it introduces emphasis, for the native French listener, who perceives the prominence structure as either inter-phrasal or full of accents d’insistance, thus sounding chopped and continually emphatic. Thus, when French speakers imitate a Germanic way of speaking French they transform accent bars into prosodic phrases with strong final lengthening and emphatic intensification.

The Germanic languages have an accentual interlevel between the syllable and phrasal, meaning-triggered structuring. Phrase-internally, they group syllables into feet of a prominent syllable followed by non-prominent ones; French lacks this interlevel; it uses the same type of structuring phrase-internally, i.e. it marks the right edges of meaning-triggered syntagmas by prominence and, above all, by final lengthening. There is thus a gradient scale from inter-phrasal to intra-phrasal structures. In view of the different prominence organization in French, the pitch accent concept of AM, modelled on a Germanic accent structure, cannot be considered adequate for the prosodic analysis of French (cf. 1.1.5, 2.2.1).

The different organization principles of prosodic phrasing are at the root of classifying Germanic languages as stress-timed and French as syllable-timed. These categories have been discussed extensively. For an overview see Kohler (2009a).

Since French lacks the accentual interlevel, the phrasal prominence units, binding uncompressed syllables by final lengthening, will not create regular rhythmical patterns if utterances are controlled by semantic function. Temporal regularity is initially at the lower level of the syllable, as there is a preponderance of open CV syllables in mots phonétiques. But this does not trigger, for a listener, a recurrence of a rhythmical prominence profile, which is the essence of any rhythm concept. At this point the performance factor intervenes. Depending on their rhetorical proficiency, speakers can regularize their phrasal organization in two ways, (1) with regard to the number of syllables per
prominence unit due to the choice of words and syntactic structures, (2) by compensating unequal numbers of syllables in a unit through the adjustment of their speech rate, especially via degrees of final lengthening. These techniques are established in versification. In French verse, as in all other Romance languages, syllables are counted per line; in Germanic verse it is the number of accented syllables. For example, the *Alexandrin Classique* has 12 syllables per line divided into 2 *hémistiches* of 6 syllables, and each of these has 2 parts that may again be equal in number of syllables, as in

(31) Un destin | plus heureux | vous conduit | en Épire
(Racine, Andromaque; Grammont1958: 50)

It is a perfect anapaest rhythm, not with compression of non-prominent syllables as in Germanic languages, but with lengthening of the prominent ones. Here are two examples of uneven numbers (Grammont 1958: 50)

(32) Et le char | vaporeux | de la reine | des ombres (perfectly regular)
Monte, | et blanchit déjà | les bords | de l’horizon (slow–fast)
Lamartine, L’Isolément)

(33) Il ouvre | un large bec | laisse tomber | sa proie (slow–fast –slow)
(La Fontaine, Fables)

This leads on to the next Section and the discussion of the interaction between the coding of meaning and of rhythm in prosodic phrasing.

### 4 Meaning and rhythm interaction in prosodic phrasing

In spontaneous speech, and even in prose text reading, the accentual interlevel in Germanic languages cannot maintain a perfectly regular rhythmical foot pattern over long stretches of time because the organization into meaningful units interferes and takes precedence of the rhythmic principle. But in verse, greater regularity is achieved, and it becomes essential in nursery rhymes, where it wins over meaning.

The interference between meaning and rhythm is well illustrated by the nursery rhyme from Mother Goose
Every lady in this land
has twenty nails upon each hand
five and twenty on hands and feet
and this is true without deceit

The marking of bars and the line organization represent a regular flow of trochaic feet that are congruent with the syntactic structures and are supported by rhyme on the rhythmic beat at the end of lines. To create this rhythm the function word “in” gets the strong beat prominence whilst in a prose reading it would be as weak in prominence as “this”. Furthermore, this rhythm can only be achieved when the word form “upon” is used, “on” would disturb the rhythmic flow. But this perfectly regular rendition of waning prominences produces non-sensical meaning.

The proper meaning can, however, be conveyed with the following rhythmical structure:

Every lady in this land
has twenty nails on each hand
five and twenty on hands and feet
and this is true without deceit

The rhythm is also trochaic, but there is **enjambement**, with syntactic and prosodic phrasing boundaries inside bars and lines, and rhymes not supporting the syntactic organization. The rhythmic flow can still become quite regular if the prosodic boundaries “nails.” and “five.” are created by phrase-final pitch movement rather than lengthening and, of course, without pauses. However, in this case “upon” has to be replaced by “on”, otherwise the rhythmic flow would again be disturbed.

In each of these two versions, clapping the rhythm of the accentual units produces a remarkable coincidence of clap and accent onset and perfect perceptual rhythmic regularity. The example shows that there are two organizational principles in speech: (a) meaning-driven through lexical, morphological, and syntactic structuring, and (b) rhythm-driven through waxing or waning prominence profiles over syllables. The two principles may work against each other, as in prose text reading, but either the one or the other may win in different speaking styles, the semantic principle in spontaneous speech, where
constant dysfluencies prevent the establishment of recurring rhythmic patterns over long stretches of time, and the rhythmic principle in nursery rhymes, as the most elementary speech stylization to engender regularity of bodily movement in children, where meaning takes second place. The experienced orator is able to make the two principles converge for optimal rhetorical effect on an audience. So, rhythm in speech is not only controlled by speech style but also by individual speakers' proficiency which may be arranged along a scale from bad to good rhythmicity.

Even if speech structuring by meaning is primary in spontaneous interaction, and in reading, rhythmic structuring must not be absent altogether. It aids intelligibility: rhythmic beats guide the listener, allowing the projection of events to come. So, rhythm has an essential communicative function in the transmission of meaning from speaker to listener. This is where rhetorical proficiency comes in. Good rhetoricians, such as Martin Luther King, Barack Obama, Helmut Schmidt, Charles de Gaulle have captured listeners by commanding all the verbal and rhythmical registers of meaning transmission.

Everyday reality looks a bit different, especially as regards the pool of informants linguists and phoneticians usually dip into, predominantly today's student population. For example, text readings from the English IViE corpus or from the German Kiel Corpus of Read Speech provide examples of mediocre rhythmicity, without clear regular rhythmical beats and salient grouping. Such poor speech performance becomes a public concern when announcements at airports or stations, in trains or on planes are difficult to follow because speakers typically ‘rattle off’ information in routine fashion at high and increasing speed, without rhythmical structuring. Their intention is no longer the transmission of important information, but to get the repetitive task during a day’s work over and done with as quickly as possible. The result is low intelligibility, particularly in the disturbed acoustic environment, for example, in an airport departure hall. Airlines, and other companies that depend on efficient oral
communication with their customers, should take note of prosodic research and train their staff to improve performance in public speaking.

5 Conclusion

Linguistic, phonetic, and particularly prosodic research need to reflect on what their goals are. If they want to find out how humans communicate meaning in social interchange in cultural settings in the languages of the world, as I think they should, then meaning and function in speech interaction need to be put at the centre of research. Linguistic form and phonetic measurement only become insightful if related to them. Research paradigms that put communicative meaning and function second, or do not consider them at all, cannot get speech science very far, and their results will provide little of interest to the social sciences. This also means that the outdated dichotomies of phonetics versus phonology and of linguistics versus paralinguistics need to be overcome. The central message of this paper is to demonstrate that prosodic phrasing unites two functions in speech communication, the coding of meaning as well as the facilitation of meaning transmission by rhythm, and that prosodic research therefore needs to consider both the semantic and the rhythmic principle of structuring speech in communication, as well as their interactions.

In 1882, Wilhelm Viëtor published a little pamphlet on the need to change language teaching and language learning under a pseudonym in the form of the provocative question *Quousque tandem?* and he provided the answer in the title *Der Sprachunterricht muss umkehren!* (“Language teaching must take a new direction!”). He advocated that the instruction in modern foreign languages should be based on speaking and listening, thus going beyond the written skills exclusively practised for the classical languages. This initiative, taken up by the Phonetic Teachers’ Association (later L’Association Phonétique Internationale / The International Phonetic Association) and its
Journal Le Maître Phonétique caused a revolution in foreign language teaching methodology, and in the century that has passed since this publication, the acquisition of foreign languages has been greatly improved. But the whole field of prosody still remains a stepchild in pronunciation teaching because learners are, for example, not normally familiarized with the rhythmic differences between Germanic languages and French, or other Romance languages, nor with the expression of meaning relations by paradigmatic and syntagmatic prosodic patterns in speech communication.

This is all the more surprising since the London School of Phonetics produced excellent descriptions of English and French accentuation and intonation. They may not have been systematic enough in the eyes of AM and other phonologists, and may have been considered ad hoc and anecdotal in their semantic interpretations, but they are very thorough and useful descriptive accounts, whose impact has been dwarfed by the AM recycling of some of the same data, aimed at increasing phonological systematicity without raising the informational value of, and insight into, communicative functions. To be really applicable to important fields of human pursuits, such as the acquisition of foreign languages or the effective use of the native language in speaking professions and in public speaking, prosody research also has to turn about. It could no doubt benefit greatly from focussing on function in speech communication. The applications of such redirected research in the social sciences, and in language teaching and learning for that matter, will bear rewarding fruit.
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The transmission of meaning through prosodic phrasing


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2 Audio illustrations of examples can be found at the following address: http://www.ipds.uni-kiel.de/kjk/pub_exx/kk2009_1/hamburg.ppt

3 It is found in words with double stress, e.g. numerals in ‘–teen or words like ‘prin’cess, ’Piccadilly. In the context of another lexical stress in an immediately preceding or following word, forming a close syntagma with the double-stress word, stress is reorganised into a new double-stress pattern at the initial and the final stress position of the syntagma, creating a regular 2-beat rhythmical prominence profile: ‘just eighteen, eighteen ’years, or a ‘young prin’cess, ’Princess ’Anne. The stressed syllables need not be contiguous for this to apply: a ’royal prin’cess, ’Princess Victoria,’close to Piccadilly,’Piccadilly’Circus.

4 If in (22a), ‘Amerika’ gets a late rise-fall accent, the negated action is contrasted with what others might expect, and this reasoning is rejected; so the meaning approaches the 2-accent case of (22b), but the action is definitely not true, whilst in (23b) it may not be true.

5 Pauses in such an appellative function may also occur at low syntactic nodes, e.g. between article and nominal in “You’re a [pause] fool.”, or even inside a word in “Abso[pause]lutely.”, “Don’t for[pause]get.” In these cases, the pause may be filled by expletives (in English even word-internally and often of the four-letter type), whose only function is to highlight the following accent and its appellative and expressive meaning: “You’re a [bloody] fool.”, “Abso[blinking]lutely.”, or the sergeant-major to the private who wants to leave the barracks “You’ll be back by 10, and don’t for[****]get.” The heightened accents are often force accents for negative emphasis (Kohler and Niebuhr 2007).

6 Taken from the opening words of Cicero’s In Catalinam: “Quousque tandem abutere, Catalina, patientia nostra?” [“How much longer, pray, Catalina, are you going to abuse our patience.”]