The Meaning of Language

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Edited by

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PREFACE

This book is a collection of a number of conference presentations from the *26th Scandinavian Conference of Linguistics* that took place in Aalborg, Denmark, in August 2015 under the auspices of the *Nordic Association of Linguists* (NAL).

I would like to thank Farshad Badie for assisting me in the editing of the book, and I would also like to thank Gerald Delahunty, Charles Prescott and Martin Prior for helping me with the English language.

—Hans Götzsche
Editor

CHAPTER ONE

THE MEANINGS OF LIFE

HANS GÖTZSCHE

Introduction

The main purpose of this chapter is twofold: on the one hand, I shall present the content of this book and its diversity and, on the other hand, I shall take up some of issues concerning the theme of the book: linguistic meaning. The theme has its background in the label of the 26th Scandinavian Conference of Linguistics that took place in Aalborg, Denmark, in August 2015: 'the meaning of language: the semantics, logic and psychological reality of words and sentences'. The following sections make up an essay on this theme, whereas the chapters, based on some of the papers at the conference, approach the theme by pursuing a number of different paths.

Hans Basbøll's contribution on Danish linguistics after the Renaissance has its focus on the development of Danish phonology and prosodic morphology, an account that illustrates Denmark's acknowledged tradition in the language sciences and forms the only consistent account in English. The narrative starts with Jacob Madsen Aarhus (1538–1586) but the 'linguistics giant' of the 18th century is Jens Pedersen Høysgaard (1698–1773) who wrote not only in Latin but also in Danish. His main legacy can be said to be his description of the Danish 'stød' and his schematic overview of Danish vowels, but his grammatical insights are also significant. Høysgaard's oeuvre has been an inspiration for later generations of Danish linguists, and the chapter mentions Rasmus Rask and Karl Verner. The portrayal of this period of Danish advances in linguistics will also be of interest for scholars outside Scandinavia.

Stig Eliasson asks the question of what obstacles there can be to morphological borrowing between languages, a topic that has attracted recent attention. This kind of copying does not happen often, in opposition to lexical borrowing, and which factors have an influence on the

phenomenon, whether societal, cognitive or structural, are of special interest from a descriptive and theoretical view. The account is very detailed and adduces data from a number of languages, among them Turkish (Turkic), Basque and Samoan, and it offers the reader a host of details and analyses.

The next chapter by Kambiz Badie looks at linguistic meaning from a perspective quite different from the prevailing viewpoint of the western tradition. The chapter offers ideas about how background knowledge works in order to extract meanings from texts and how such meanings can be transformed. Lars Behnke's contribution is an empirical and experimental study of how Danish learners of German handle similar phonetic segments, and Christina Schoux Casey takes up another topic in speech analysis, viz. New Orleans English Phonology, something that is 'nearly unstudied'. Because of the history of New Orleans the dialectal situation is quite special, i.e. that 'New Orleans remains marginal to the South in terms of phonological features', and the study can be seen as a model for linguistic field work. The chapter by Gerald Delahunty is about language use, what words are used in the genre of 'appeal letters'? Such letters 'deal with extremely exigent situations, e.g. impending executions, they show us how this exigence is represented in the context of other factors, … '. It is a matter of how words are used in society as rhetorical means, often with scary outcomes or, hopefully, the opposite. Thorsteinn G. Indridason brings us back to some other small-scale details in a specific language, Icelandic, and takes up the behaviour of 'intensifiers', bound and free respectively. The paper by Vilma Symanczyk Joppe on the orthography of German compounds, and her and Robert Külpmann's paper on null objects, are also on grammar issues, whereas another way of doing things is presented by Zhanna Maslova and Denis Minakhin in their contemplations on metaphor and its historical background and cognitive functions. A third contribution on speech sounds is presented by Mitsuhiro Nakamura who brings into focus the 'word-final alveolar stop[s], /t/ or /d/' in British English, i.e. a study with acoustic data. The findings of such kinds of study are essential when trying to understand the variation in language usage and changes over time. And Charles Prescott has yet another perspective on almost the same thing when he examines 'dorsal stop series in Indo-European', viz. a search for reasonable reconstructions of pre-historic language structures, whereas Martin Prior explores the potentials of the interface between language and logic, also touching upon the language and logic of time. In Miguel Vázquez-Larruscaín's chapter we are back at grammatical studies again: now using Optimality Theory, he analyses Norwegian dialects as compared with the other V2 languages

of the Germanic group**.** And Johanna L. Wood & Sten Vikner close the grammatical theme with a chapter on indefinite determiner doubling, a topic not usually taken up in grammar books, and data has been found in English, Danish, Swedish and varieties of German and Norwegian. The volume concludes with Farshad Badie's formal analyses of possible linkages between Predicate Logic and so-called Occurrence Logic.

In sum, the topics of this book do not cover everything in current linguistics but the volume brings up a number of issues that illustrate the essentials of linguistics. Thereby pointing to the fundamental question: what is meaning?

Meaning?

Assume the following scenario: Alfred tells Brian that 'Peter hasn't fed the dog today' by uttering the corresponding chain of speech sounds in his dialect. It takes place in a specific physical context in which Caroline and the dog are also present, for instance in Alfred's kitchen, and the dog's food is available. If the people present speak Alfred's dialect then they will understand what he says by attaching the intended meaning to his speech sounds; also considering that the sentence is negated, which makes the event referred to ('feeding the dog') non-verifiable. This fact, that words have meanings, has puzzled 'language scholars'[1] and philosophers for millennia and poses a yet unsolved problem since nobody, so far, has been able to explain how and why it is possible. Even more complicated to explain is the scenario in which Alfred meets Brian in the street and Alfred tells Brian the same little story. Then we have a case of displacement, i.e., they talk about things not perceptually (visually or audibly) available in the local environment; not even potentially. This is a major theoretical problem concerning natural languages; being even more intriguing because, as is well known, children start looking for things they cannot see in the local environment before they are 1 year old, which means that toddlers seem to have established the cognitive basis for later using[2] words about objects only represented in their memory. As for technical languages

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[1] Since the term *linguist* is fairly new, and the term *linguistics* even newer, both coming into use after the Middle Ages when modern science emerged then it would not be appropriate to label earlier intellectuals studying language 'linguists', see Koerner and Asher (1995).

[2] When later *speaking*; they *hear* words referring to unseen things all the time.

(e.g. programming languages) and formal languages (e.g. mathematics) the problem about what meaning is becomes almost insurmountable.

In his review 28/09-15 at Notre Dame Philosophical Reviews[3] of Alexis Burgess and Brett Sherman: *Metasemantics: New Essays on the Foundations of Meaning*, Oxford University Press, 2014, Derek Ball, University of St Andrews, makes the following remark: 'In fact, one of the remarkable features of the collection is the level of reflective disagreement about the right foundational questions to ask: in addition to the editors' introduction, several of the essays are devoted to distinguishing and defending the significance of different metasemantic questions.'

Accordingly, today there is a fairly high number of approaches to the topic, and endeavours in a search for answers encounter the additional problem that different fields of knowledge use different nomenclatures (or sometimes the same nomenclature but with different meanings), for instance in linguistics and philosophy, thus

> This discussion exemplifies a general problem: We use many terms that have very unclear reference, and as a result we don't understand each other. (Martin Haspelmath, the Lingtyp mailing list, 7 April 2017@08:57 CET)

Semantics

In the short version—and commonly acknowledged by linguists and philosophers—one can say that the label 'semantics' denotes 'the study of the meaning of words, phrases and the larger units of language', and the current state is that we, as linguists, know that it works but not how and why it works. The state of the art is that, at one extreme, we have formal (and mathematical) and technical (and computational) models (not to mention artificial intelligence and robotics), and, at the other extreme, we have contextual interpretations (in words) of what people say and write; and maybe between the extremes we have cognitive and neuroscience approaches that try to uncover the mental and physiological processes that seem to be the roots of language use and usage, including language meaning.

One may illustrate the problem with an analogy: 'the blind carpenter's jigsaw puzzle'. Imagine a blind carpenter who has developed an ability to make jigsaw puzzles by letting his fingers follow the pre-cut grooves

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[3] http://ndpr.nd.edu/news/60166-metasemantics-new-essays-on-the-foundations-of-meaning/

separating the pieces when using the jigsaw (hopefully not cutting off his fingers). In advance, the picture on the jigsaw puzzle has been glued by someone else to the plywood and the carpenter successfully separates the pieces. Now, by accident he drops a number of the pieces on the floor, and he can't find them, so he won't be able to put together the pieces in order to rebuild the picture—which he knows is there but has never seen.

In my view the current state of affairs in linguistics, and especially semantics, is like this. We hope there is a full picture, but we have never seen it, and we have been busy cutting the pieces apart—and we are able to put some of them together—but we don't know how many we have lost, and in the meantime we keep struggling to fit together the pieces we have, at the same time searching for pieces we think we have lost.

Furthermore, a special problem concerns the relationship between different kinds of symbolised languages, namely what may be conceived of under the labels 'formal' and 'technical' languages mentioned above. The question is twofold:

   i.   What is the semantics of symbolised languages that must be seen as developed on the basis of natural languages?
   ii.   Are symbolised languages more suitable for sketching the semantics of natural languages?

One may notice the following statement by Hinzen:

> … designing an artificial language allows no empirical conclusions on human language design. Its design will depend on the designer's purposes … . The design of human natural language is simply what it is. The artificial language may be specifically designed to enable communication, but this would not necessarily tell us anything about natural language design.
> (Hinzen 2006: 25)

Hinzen's statement prompts the following additional questions:

  (i) To what extent is it plausible to assume that the semantics of natural language expressions can be formalised in different logics like Description Logic and Predicate Logic? Special attention should be given to the notion—and yet unsolved problem of—self-reference and the ensuing paradoxical and intriguing puzzles, for instance testing the 'connective of content implication: $p{:}q$', presented by Piotr Łukowski (Łukowski 1997, 2006).

(ii) To what extent is it plausible to assume that these logics can represent linguistic meaning in pragmatic settings/situations?

(iii) To what extent is it plausible to assume that these logics can be used as frameworks for models of where linguistic meaning is situated: in cognitive science and neuroscience approaches?

Whether basic scientific concepts should be defined by philosophers or scientists has been the source of much controversy, but in current linguistics there is a general divide between so-called 'formalists' and 'functionalists' (cf. Newmeyer, 1998). Even though both terms are rather vague the overall picture is that the prevalent formalist approach is the Chomskyan, whereas functionalism is represented by a broad and, in fact, disparate number of approaches that are basically descriptive.

The latest demonstration of the Chomskyan way of doing things is Berwick & Chomsky (2016), and, as usual, Chomsky asks the right questions: 'What is the nature of language? How does it function? How has it evolved?' (p. 1). But, as mentioned in Götzsche (2013: 48-64), his answers are, in general, not satisfactory; or, using his own words when criticising others in Berwick & Chomsky (2016): 'incorrect' (p. 9), or 'plain wrong' (p. 10).

This is so because his basic claims are: (i) ' … the Basic Property of language: that a language is a finite *computational* system yielding an infinity of expressions, each of which has a definite interpretation in semantic-pragmatic and sensorimotor *systems* (informally, thought and sound)' (p. 1). (ii) 'Human language syntactic structure has at least three key properties, all captured by minimalist system *assumptions*: (1) human language syntax is *hierarchical*, and is blind to considerations of linear order, with linear order constraints reserved for *externalization*; (2) the particular hierarchical structures associated with sentences affect their interpretation; and (3) there is no upper bound on the *depth* of relevant hierarchical structure.' (p. 8). And, furthermore: '(2) implies that structure (in part) *fixes* interpretation at the level of "meaning." (ibid.). And, finally: 'the … syntactic object is also assigned a label by some *algorithm* that satisfies the conditions of minimal *computation*.' (p. 10). [my italics, Hans Götzsche]

The puzzles presented by these claims are: (i) What is the justification for saying that 'language' is a 'computational system'? Firstly, the wording seems to be metaphoric (like the notions of 'hierarchy', 'depth' and 'fix'), because, so far, we do not know the details of how the brain is able to process what we call mental phenomena or cognitive systems, including linguistic items. The brain may not work like a computer using

software algorithms. Second, why should syntax be perceived as a separate (cognitive) system, working only by interfaces (whatever that is) with a sound system and a semantic system respectively? (ii) What is the justification for claiming that syntax is hierarchical? As is well known, all the way back to Chomsky (1957) sentences have been seen as hierarchical structures of word classes (so-called 'phrase structures') but apart from the intuitive idea of word classes as the foundational building elements of linguistic expressions and empirical tests in the vein of Jakobson's paradigmatic replacements there seems to be no theoretical underpinning of the assumption.

Even though the Chomskyan *modus operandi* has provoked much debate and, with all due respect, must be acknowledged to have inspired much clarification of basic ideas in linguistics and philosophy, its shortcomings may be due to the fact that its conceptual framework is not new. The interesting issue is not that it explicitly refers to Cartesian understandings (see Chomsky 1966) but that its principles are analogous to the compartmental thoughts presented in, for instance, Steinthal (1855) in which it is argued that grammar and logic are separate entities, because the question: ' … ob Sprechen und Denken identisch sei … ; ob Grammatik und Logik ein und dasselbe seien, … ' (p.144) is answered clearly by: no! (see Steinthal 1855: 154-155); i.e. human thinking (logic) is considered a separate (mental) entity. This is in line with a current approach, viz. the one proposed by Jerry Fodor (2008) as 'LOT' ('Language of Thought'), which assumes that thoughts are, somehow, autonomous entities in the mind:

> Just as the semantics of sentences are constructs out of the semantics of words, so the semantics of thoughts are constructions out of the semantics of the concepts that are their constituents.
> (Fodor 2008: 19)

One may ask what concepts are if disconnected from words, and the answer seems to be the usual one from a philosopher: '… paradigmatic thinking is directed to ascertaining truths.' (ibid. 8). So we need concepts to have truth functions, and therefore we think by means of concepts. Some linguists also talk about concepts as entities: 'I have to make it clear, though, that not all concepts and thoughts are meanings of words or sentences.' And: 'These sorts of concepts and thoughts can exist on their own in the head … ' (Jackendoff 2012: 70). Jackendoff's book is a 'linguistics for the layman' so one might expect this to be the state-of-the-art basic knowledge in linguistics. But what are concepts then? Not visual

images, as is stated on p. 51 seqq. taking up the old friend: the notion of a triangle.

But, one of the insights proposed by Darwin:

> A long and complex train of thought can no more be carried on without the aid of words, whether spoken or silent, than a long calculation without the use of figures or algebra.
> (Darwin 1871 (*The Descent of Man, and Selection in relation to Sex*. London: John Murray), quoted from Berwick & Chomsky 2016: 4)

is at odds with this idea of compartmental theorising. Even though the history of philosophy after the Renaissance struggled with the separation of mind and matter, from Descartes to Locke, Berkeley and Hume to name a few, what we call (human) thinking can hardly be separated from the mental representations of aspects of the outer world picked up by our perceptual faculties, nor can it be separated from linguistic expressions; i.e. there seems to be no separate (more or less autonomous, 'on its own') conceptual system taking care of 'thinking'.

Grammar, then?

Traditional grammars are, basically, descriptive; even when they claim they are formal descriptions. The first grammars were partly descriptive generalisations, partly school grammars, and as pedagogical tools they were excellent. But the Chomskyan idea that a grammar is a mental, or cognitive, entity presented the theoretical models of grammars with certain criteria: they should be able to process all the sentences of natural languages, and also avoid producing ungrammatical sentences. These criteria are somewhat difficult to meet and Chomsky's Generative Grammar has been elaborated on since the middle of the 20th century without having achieved that. There are two reasons for this imperfection.

(A) One is that the syntactical models made very complicated assumptions about how a sentence is built, typically:[4]

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[4] The diagram is a tree structure analysis of a phrase, but since sentences are, by Chomsky, seen as only versions of phrases it does not affect the line of reasoning.
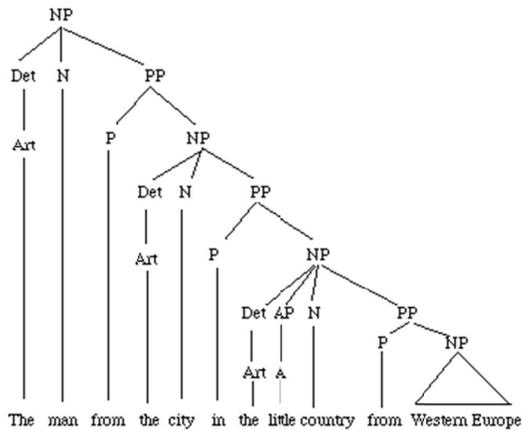
One basic principle is that the structure is made of bifurcations (even though here we have also trifurcations). Another basic principle is that the end product is the outcome of a number of transformations of so-called 'deep structures', meaning that the words start out from other, more fundamental, positions and are moved around until they end up like here. That means that the 'tree structure' is (i) hierarchical, and (ii) a road map that the words must follow in order to find their 'right' places.

Some attempts to formalise later versions of Chomskyan grammar like Collins and Stabler: 'A formalization of Minimalist Syntax', in *Syntax*, 19:1, March 2015, offer a number of clear-cut definitions and some symbolisms, but there is no basis for setting up a calculus (or different calculi) that is able to process the formalisations (and should somebody undertake such a mission the algorithms will be fairly complex). So this is just another reasonably precise (semi-formal) descriptive approach.

(B) In the example above words are simple entities because the language is English; and the linguistic items are text entities. We might not take up complex languages like Latin, Icelandic or Finnish, but perhaps German, for example:

Der Mann von der Stadt in dem kleinen Land Westeuropas.

The underlined parts are, as is well known, expressions of case inflection, the dative and the genitive, and, furthermore, the adjective *klein* has been inflected because of the dative case of the noun phrase: *kleinen*. Imagine,

then, the complex system of verb conjugation of the Romance languages, or just take a look at a simple expression in Finnish:

Ymmärrät(te)kö suomea? 'do you understand Finnish?'

The first of these words has an elaborated morphology: ymmärrä-tte-kö 'understand' + 'you (plural)' + (interrogative particle), which means that word forms are supposed to be merged by adding a number of inflectional endings and particles to a stem. But Finnish may have much longer words, and Finnish is, from a systematic point of view, fairly easy to learn; just follow the rules. Whereas a language like Icelandic, in which specific endings have more than one meaning, is more complicated and often you do not know if you have found the right inflectional paradigm of the word you want to use. There seems to be a shortage of disambiguating rules.

Traditional grammars are excellent descriptive tools when one wants to learn a language or check one's own writings. But assume that the brain must set up a cognitive system that is expected to handle these things in accordance with the descriptions just offered.

First one has to put together words from stems + (potentially) some derivative forms + a number of endings + (potentially) some particles. Then one has to put together the words in a non-sequential fashion, and, finally, one must carry out a number of movements in the tree-structure for the words to end up in the right places so that mother tongue speakers don't get upset. This must take some time; and not many speech sounds may come out of one's mouth at the end of the day. And it is even more intriguing when considering that brains work rather slowly, in the sense that it is a well-known fact that electronic devices work at a very high speed:

Compared to the speed of electrical information traffic along the wires in a computer (close to the speed of light), conduction velocities of impulses in the brain are slow, about 120 metres per second in the fastest conducting axons.
(O'Shea 2008 p. 28)[5]

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[5] O'Shea, M. (2008): *The Brain. A Very Short Introduction*. New York: Oxford University Press. Quoted in Götzsche, Hans & Ksenya Filatova (2012): 'On the Ontology and Cognitive Processing of Languages ', in Cognitive Dynamics in Linguistic Interactions, Cambridge: Cambridge Scholars Publishing, pp. 81-106.

Compared to electrons brain impulses are, actually, very slow, but the curious thing is that humans are, at least so far, much better at linguistic processing than electronic systems.

Imagine then, that a software system is set up in order to mirror this way of describing linguistic phenomena; maybe the purpose is to make acceptable electronic versions of one's grammar and lexicon, and this may work well. But if the purpose is to make software systems that should facilitate solutions to ordinary and practical linguistic tasks, for instance text translation, use of interactive devices or creating summaries of large amounts of texts, then traditional grammars and lexicons may have a fairly low process efficiency ratio. An alternative is to use stochastic methods but their success rate may vary.

Minds and Machines

We will, below, come back to the claim that we know little about how the brain is able to process our mental life—a claim that is, albeit, disputed—but for now we may just accept it. Then one imperative question is how to handle the issues of human minds as mental universes, cognitive systems as instruments of learning and knowledge, the nature of language, and the issue of human vs. machine intelligence. The question is relevant because it seems empirically sound to say that humans and their brains are able to create meanings in human minds in the form of semantics of words and sentences; whereas we do not know if there is anything like it in machines.

It should be observed that much of the jargon of current terminology in the field of using software systems to carry out tasks otherwise assigned to humans is characterised by tropes, for instance the notion of 'deep learning algorithms', whose meaning has not much to do with 'deepness' or with 'learning'. It should also be observed that there are crucial differences between the way humans solve tasks and the way it is done by so-called Artificial Intelligence (AI) systems; a fact that is in general accepted by scholars in the field, though also this claim may be disputed. An issue is, for instance, how AI software was able to beat the world champion in chess, and, some time ago, how an AI system was able to beat the world champion in the board game Go. And only by the use of sufficient computational power.

One answer is that, as mentioned above, the signals of electronic machines travel at a very high speed, which may give the machine an advantage, but another answer is that the essence of such board games is that the number of different combinations of configurations of the pieces is, at best, very large, but that modern computers are able to calculate a

very large amount of potential configurations in a very short time, by carrying out a large[6] number of calculations in a combinatorial system. However, even though the number of configurations is very high it must be finite and each single configuration must be discrete. So, although modern computers are very powerful—and will be even more powerful in the future—it may be a characteristic feature of computational machines that they can only provide one with

   a finite set of discrete solutions[7]

when carrying out a specific task, whereas humans are apparently able to ask questions to which an answer may not be 'a finite set of discrete solutions'. It may, therefore, be convenient to redefine the notion of 'intelligence'. As demonstrated by Ken Richardson (1999), the traditional psychological idea of 'intelligence' has an almost bizarre origin, including a number of meanings not all of them consistent with the modern idea of 'abstract thought' or 'understanding', or with the dictionary definition: 'an ability to acquire and apply knowledge and skills'. Machines work by CPUs, other chips, circuits and memory devices, and a number of software algorithms, whereas brains work like brains—though, for the moment, we do not know how brains work. The idea of taking brains to be a kind of machine and a machine as some kind of brains may be better abandoned. So far it looks as if brains are a little better at specific kinds of combinatorics than machines because a language may, at any given time, be described by a combinatorial system with, not a few hundreds of pieces like in a board game, but with, at least, tens of thousands of words of which the number of configurational combinations is fairly high, even though there are obvious constraints to the combinations yielding certain constructions in language usage. Furthermore, and this is crucial, natural language 'combinatorics' can have its principles changed all the time: words may mean different things in different contexts. Accordingly it may be suggested that the notion of 'intelligence' as such, even when applied to humans, may better be defined by the relevant feature of machines: the ability to yield 'a finite set of discrete solutions', and, if not, it is nothing more than a 'brand' and should be substituted by some more appropriate notion.

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[6] I take no stance on the question of exactly how large the respective amounts are.

[7] I am inclined to call this 'Gõtzsche's first theorem'; but, of course, it needs proof.

Life

What to do with meaning, then? My colleague Farshad Badie has compiled a minor number of contexts in which the expression *semantics* is currently used by the scientific community. Of the 72 contexts only a small number (the nomenclature is not always transparent) seem to be consistent with each other, and a number of fairly opaque formulations appear, e.g.

> *Semantic Bug*: Bugs are the root of all problems in software development. Semantic bugs include some of these bugs plus major planned features for Semantic Forms.
> *Semantic Hashing*
> *Semantic Alignment* "the ability to efficiently exchange data between the technical/operational layer and the business/social layer and to correctly interpret the meaning of the data that has been exchanged in the right context and within a reasonable time".

Maybe it doesn't matter; we may just say: 'cobbler, stick to your last', whatever you call things in your workshop, and don't think too much about other workers calling their lasts by the same word while actually doing something very different (cf. the quote from Haspelmath above). But is such semantic broadening not obscuring things? What is, for instance, meant by the expression 'semantic web'? Are the electronic circuits actually able to attach *meaning* to software versions of words, thereby also being able to *understand* issues? And is the brain just some version of this mechanism? Some people seem to think so, as can be seen in the recent publication by Stanislas Dehaene (2014) in which, among other things, he puts forward the idea that human consciousness[8] can be explained directly by certain brain processes. This is based on the evidence that brain scans carried out by the British neuroscientist Adrian Owen demonstrate that otherwise paralysed persons are able to imagine certain things when asked to, and that this is correlated with activity at located brain coordinates. Accordingly it is concluded that such voluntary mental actions represent consciousness. But maybe the question is asked in the wrong way. Suggesting a few fundamental notions may indicate why.

Assuming that humans are what we call organisms in the biosphere apparently they differ from other organisms in two ways: (i) humans are

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[8] Assuming that meanings of words have to do with one being conscious of those meanings.

not plants, on the contrary the kind of organisms we belong to are moving organisms. We seem to have developed neural cells and systems (from primitive nerve net organisms) because we move. So, *animals* (like us) have *brains* because they *move* and *do things*; that is, they have *reactive systems*. (ii) We as humans seem to have *big brains* because we *move* (mainly on land), do things (seek and hunt) and, crucially, *make things* (that improve survival); so we have *active* systems. Whereas (maybe not all) animals may have what we call *awareness* of the environment (nerve net creatures may justifiably be assumed not to have awareness) and may be able to *control* what we call *attention*, *humans* may be said to have awareness of the environment and be able to *control attention*, but humans *also* seem to have *self-awareness*, which may be seen as awareness of oneself in a specific environment, and self-awareness may be said to constitute *consciousness*. And it may be rather difficult (seemingly impossible) to imagine consciousness without language, i.e. using linguistic expressions to develop (for humans essential) referring notions and imagining notions like 'present, past and future'. [9] So Dehaene's approach has two shortcomings: (a) it seems to confuse 'consciousness' with 'attention' (we may not know to what extent paralysed persons have self-awareness), and (b) correspondence between linguistic phenomena and located brain activity does not tell us what the brain is actually doing; because we did not know in 1999, cf.:

> ' … she worries that brain imaging is still a relatively crude tool. On its own, she says, it 'cannot inspire a theory of how the brain works. All it tells you is that if you do this or that, different bits of the brain light up on a scan—it doesn't tell you why or how or what that means.'

'She' is Susan Greenfield, former Director, The Royal Institution, London, and the quote is rendered by the interviewer Alison Goddard in *Predictions* (1999: 151).[10] And to this day we do not know.[11]

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[9] See publications by Kant, Arthur N. Prior, Soave and Øhrstrøm & Hasle.

[10] Susan Greenfield, in Griffith, S. (ed.) 1999: *Predictions*. Oxford: Oxford University Press (The Times Higher Education Supplement), pp. 149-154. Also quoted in Götzsche (2013) p. 52.

[11] The Nobel Laureate Maybritt Moser, NTNU, has indicated (personal communication) that this is true, and Alessandro Treves, Scuola Internazionale Superiore di Studi Avanzati, Trieste, has confirmed (personal communication) the claim.

Conclusion

One can say that all this is important for our understanding of what humans are and what human life is, and it is also important for our understanding of what place humanity has in the universe as conceived of by science and ordinary people. Human life, as we know it, seems to need language with meanings of words in order for us to know that we are humans. My wife's dog, in all likelihood, does not know it's a dog; whereas we know we're humans; who are, moreover, capable of owning dogs.

Therefore one may reasonably infer that my wife and I (apart from the special bodily feature of our articulatory apparatus and some other features) are distinguished from dogs because we are equipped with a fairly advanced neuronal system, whereas her dog's neuronal system is a little less advanced.[12] The dog's system works well, by all means. When the dog takes a high-speed tour in our living room, running around the room several times, it is able to avoid engagements with the furniture, so the processing efficiency of its neuronal system must be impressive. However, concerning the upcoming era of self-driving cars one may wonder what the most complicated task is: to take the car from my work to my home, in a number of steps which, though high, is nevertheless finite; or the living room tour of the dog? The exact tracks of which are never the same. And since both tasks are solved by pattern matching one may wonder who is the most intelligent: the car or my wife's dog? And, is pattern matching the answer to scientific questions?

So, the title of this book should actually be turned on its head: (only) Language has Meaning, in the narrow sense. And the essence of the issues taken up in the book is that human life forms have the ability to create what we call meaning, conveniently assigned to speech sounds in communicative contexts. Therefore one should not ask for 'the meaning of life' but instead ask 'how does life create meanings'?

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[12] Should one be in need of an almost indubitable criterion for being a human being the human potential for delusion easily comes up. Animals can, of course, have (e.g. perceptual) illusions but one may need the ability of imagination in order to become deluded.

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CHAPTER TWO

THE DISCOVERY OF DANISH PHONOLOGY
AND PROSODIC MORPHOLOGY:
FROM THE THIRD UNIVERSITY CARETAKER
JENS P. HØYSGAARD (1743)
TO THE 19TH CENTURY

HANS BASBØLL

1. Danish phonology and phonetics before Høysgaard (1743)

This chapter offers an outline of important linguistic analyses of the phonology and prosodic morphology of Danish, mostly treating the standard language (understood rather broadly). The focus is on word prosody, not least the Danish stød, but also the phonology of segments (vowels and consonants) is included. Studies within the philosophy of language are not treated here (whereby an important mediaeval tradition is excluded, see Hovdhaugen et al. 2000: 16-20), nor are works which are only concerned with general phonetics and phonology (although the boundary is, of course, not sharp). Jens Høysgaard is the central figure of the paper (section 2), with rather short sections on the time before (section 1) and after (section 3, emphasing the relation to Høysgaard). The chronological endpoint chosen is the end of the 19th century. The paper is to a large extent based upon Basbøll 2016 (which is in Danish).

1.1 Jacob Madsen Aarhus (1586): the first Danish phonetician

The first noticeable Danish phonetician was Jacob Madsen Aarhus (1538–1586). He spent his first years (until 1559) in Aarhus (East Jutland), and then he studied at Copenhagen University (baccalaureus 1563). After that

he was a headmaster and canon in Aarhus until in 1566 he travelled to
Wittenberg, Leipzig and Heidelberg. From 1574 Madsen Aarhus was a
professor at Copenhagen University. His work *De literis libri duo* (1586)
is a learned piece of work with extensive discussions of classical authors
(in particular influenced by Petrus Ramus), but it also has original
observations of his mother tongue, e.g., that a stressed short vowel in
(utterance) final position is followed by a breath ("Om H paa Dansk"
[About H in Danish] [all translations from the Danish are my own/HB]):

> Paa mit Sprog, d. v. s. paa Dansk, synes Aspirationen at lyde og at maatte
> skrives ikke blot foran Vokal, men ogsaa efter Vokal i Slutningen af korte
> Enstavelsesord, ligesom paa Hebraisk; f. Eks. ah (jeg), dah (da), duh (du),
> dih (de) [p. 156, Latin p. 66]
> [In my language, i.e., in Danish, the aspiration seems to sound and should
> be written not just before vowel, but also after vowel finally in short
> monosyllables, just like in Hebrew; e.g., ah (I), dah (then), duh (you), dih
> (they)]

This is an important observation which plays a role in the phonological
interpretations of Uldall (1936) and Hjelmslev (1948/1951). Madsen
Aarhus discusses in detail why the letters *j* and *v* should be introduced, and
he argues specifically about Danish ("Om J paa Dansk" [About J in
Danish]):

> I vort danske Sprog, navnlig paa Jysk, forekommer denne Konsonant saare
> ofte. Derfor er Brugen af dette Tegn ogsaa for vort Sprogs Vedkommende
> særdeles nyttig og nødvendig for den rette og nøjagtige Skrive- og
> Læsemaade. Foran Vokal: Jact (Jagt), Jeg (Eg), Jæg (jeg), Jord (Jord). Og
> med forudgaaende Konsonant: Sjeb (Sæbe), ljer (Ler), njes (Næse), tjær
> (Tjære), djærro (djærv) ... Efter Vokal: maj (Festløv, Maj), māj (Made) ...
> [p. 167, Latin p. 84f]
> [In our Danish language, in particular in Jutlandish, this consonant very
> often occurs. Therefore the use of this sign (letter) is, also in our language,
> very useful and necessary for the correct and exact manner of writing.
> Before vowel: Jact (hunt), Jeg (oak), Jæg (I), Jord (earth). And with
> preceding consonant: Sjeb (soap), ljer (clay), njes (nose), tjær (tar), djærro
> (bold), māj ([sort of] meadow) ... After vowel: maj (May) ...]

Here are indicated some Jutlandish pronunciations (e.g. with palatalization
in *njes* and *ljer*), and everything shows that he is a keen observer, noticing,
e.g., the Jutlandish apocope in *njes*, *tjær* and (with a macron over the
vowel) *māj*. He also says ("Om V paa Dansk" [On V in Danish]) (*Vav* is
an earlier letter name):

> Vort danske Sprog, og navnlig det jyske, gør megen Brug af denne Konsonant. Derfor trænger det ogsaa i høj Grad til det nye Tegn. Vav staar foran Vokal i flg. Tilfælde: vact (Vagt), væt (Vægt), ved (Vid), vid (vid), vod (vaad). – Og med foregaaende Konsonant: svort (sort). Quinde (Kvinde), quol (Kul), hvas (hvas), hvid (hvid). Vav staar efter Vokal i følgende Tilfælde: ... rov (Ro), raav (Rug, Rov). Sav (Saft), sāv (Sav), sōv (sove) ... [p. 177f, Latin p. 103f]
> [Our Danish language, and in particular Jutlandish, uses this consonant very often. Therefore this new sign (letter) is highly needed. Vav is found before a vowel in the following cases: vact (guard), væt (weight), ved (wit), vid (wide), vod (wet). – And with preceding consonant: svort (black). Quinde (woman), quol (coal), hvas (keen), hvid (white). Vav stands after vowel in the following cases: ... rov (rest), raav (rye, rapine). Sav (juice), sāv (saw), sōv (sleep) ...]

Finally in the first book (p. 191, Latin p. 127) he offers a scheme of the phonetic classification of the 'letters', e.g., with a distinction between 'lingual' [tongue] and 'labial' [lip] vowels [i.e. unrounded vs. rounded]: "A, E, I" vs. "O, U, Y".

1.2 An important ms on phonetics from 1727 (GkS 789)

In 1727 a large anonymous manuscript on grammar, phonetics and orthography (GkS [= Gammel kongelig Samling, i.e., Old Royal Collection] 789) was given as a present to King Frederik IV, first published by Carol Henriksen in 1976. This important manuscript has only had little scientific impact, and even after its publication it has not been explored by researchers to the extent it deserves. There are both arguments *pro* and *con* concerning the authorship of H. O. Nysted (1664–1740), see Henriksen (1976: 91-117) and Fischer-Jørgensen (2001: 165-169). The importance of the manuscript is so much greater because it is written in the personal orthography of the author which is meant to reflect the actual pronunciation (in Copenhagen); the orthography is in two versions of which the 'radical' is the more interesting.

The first part is a grammar of which the first sections concern writing and speech sounds (1727/1976: 140-243). The second part (1727/1976: 370-411) answers the question whether one should 'speak as you write, or write as you speak' by declaring that writing should follow pronunciation. According to Fischer-Jørgensen (2001: 169) the author's long descriptions of vowels ('selvtoner' [lit. auto-tones]) and consonants ('medtoner' [lit. syn-tones]) do not constitute a phonetic description (he just has some short comments to the effect that *b d g* are 'blødere' [softer] than *p t k*); it is much more a phonological description since he does not want to

distinguish more letters in writing than are needed. The manuscript anticipates (1727/1976: 164) some of Høysgaard's observations (see 2.1) to the effect that e.g. *lykke* 'happiness' has the same vowel (quality) as *øre* (he proposes to write the former word *løkke*). He is aware of some aspects of quantity and stress, but not (always) in a clear way (see Fischer-Jørgensen 2001: 165-182), and he has absolutely no idea that there is anything like stød in Danish (see 2.2). In general the reader can be referred to Henriksen's informative and detailed introduction (1976: 1-124).

2. Giant of the 18th century: Jens P. Høysgaard

Jens Pedersen Høysgaard (1698–1773) was born in Aarhus and from 1737 a caretaker (the third out of three) at the University (in Copenhagen). In 1759 he was appointed Bell-Ringer at Trinity (University) Church. In 1743 he presented the first linguistic analysis ever of the Danish stød (a laryngeal syllable rhyme prosody with a complex grammatical distribution, see 2.2), and he further developed this analysis, which is applicable even today (see Basbøll 2014a, 2014b), in (1747) and (1769). The two latter works constitute, together with his work on syntax (1752), a comprehensive integrated analysis (of almost 800 pages) of the Danish language—far superior to anything before—organised in 2,022 consecutively numbered paragraphs (see Bertelsen 1926). His most important works are:

> 1743b: *Concordia res parvæ crescunt*
> 1747: *Accentuered og Raisonnered Grammatica*
> 1752: *Methodisk Forsög til en Fuldstændig Dansk Syntax*
> 1769: *Første Anhang til den Accentuerede Grammatika*

2.1 The Patriot's entry (1743) and the vowel system

Tres faciunt collegium eller ... Første Prøve [af Dansk *Orthographie*] [First Attempt/Specimen of Danish orthography] is Høysgaard's first publication (1743a, anonymous). Høysgaard here participates in an ongoing debate on orthography, between Thomas Clitau (1694–1754) and Niels von Hauen (1709–1777), but he pretends that the debate is one between two great orthographists and grammarians of the 17th century: Henrik Gerner (1629–1700) and Peder Syv (1631-1702). Høysgaard treats the following points:

1) On the Use of *Vocalen i* and *Consonanten j*. Høysgaard follows Syv: *Bjerg, Høj* etc., not Gerner's *Bierg, Høi*.

2) About the doubling of *Vocaler* and *Consonanter*. Høysgaard disagrees with both Syv's *Brøød* and Gerner's *Smørr*, because neither the vowel nor the consonant is double in pronunciation. His solution is presented in 1743b: written accents (Aandelav).

3) To differentiate between Numerus Singularis and Pluralis in *Verbis*. Høysgaard follows Gerner: always singularis [as in the spoken language], not Syv.

Høysgaard concludes by saying: "*Syv* vandt da i den første Post og *Gerner* i den sidste: men i den anden blev hverken vunden eller tabt" [Syv thus won in 1), and Gerner in 3), but in 2), there was a draw].

Concordia res parvæ crescunt, eller Anden Prøve af Dansk *Orthographie*, Som viser skrevne *Accenters* Nytte, og *Vocalernes* rætte Brug [Second Attempt/Specimen of Danish orthography, demonstrating the use of written Accents and the proper use of the Vowels] (1743b, anonymous) is much more important than his First Attempt, in fact a scientific sensation. There are two main topics: on "tones" or "written accents" (see 2.2), and on the vowels which will be treated first here:

1) In 1743b Høysgaard introduces a new vowel symbol, an "open ø", as in *för* (tilforn 'before') vs. *før* (frisk 'stout'). This is a just discovered phoneme—Henrik Gerner (1629–1700) alludes to two pronunciations of *ø*, but does not do it clearly (1678–9/1919: 121).

2) Høysgaard prefers *å* (for the low back rounded vowel phoneme in modern terms), or a more IPA-like symbol, in order not to write *aa*—as was the orthography of his time (in fact until 1948). His (compelling) argument was that the vowel is not double (in pronunciation).

3) Høysgaard sees as the very first (in print, anyhow, cf. 1.2) that, e.g., the vowel in *list* is the same as in *et*—both pronounced with [e]— and similarly for *bukke* and *knopper*—both pronounced with [o]— etc. This is a new and correct phoneme analysis (cf. Bjerrum 1958), and it represents an important step away from the mixing up of pronunciation and orthography which was the rule of the day. And in 1747 (1747/1920 § 14, p. 264) he is the first to propose a complete Danish vowel system, presented here in Fig. 1, which shows "Vocâlernes nærmeste Slægtskab" [the closest relation between the vowels].

However, it is, in Bertelsen's words (1926: 119)

"hans Øre mere end Iagttagelse af Lydenes Fremstillingsmaade, som leder ham
til Opstillingen"
[his ear more than observation of the articulation of the sounds which leads
him to the system].
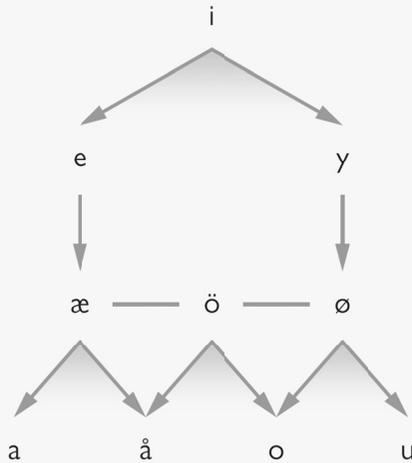
Fig. 1. Høysgaard's vowel scheme (based on 1747/1920: 264).
(Reproduced from *Dansk Sproghistorie* 1: 283, with permission granted by *Det
Danske Sprog- og Litteraturselskab* and *Aarhus Universitetsforlag*)

Fischer-Jørgensen (2001: 188) remarks that

"Den lodrette dimension har en slående lighed med den dominerende
auditive dimension jeg nåede til ved auditive forsøg med danske vokaler
(EFJ 1967)"
[The vertical dimension has a striking similarity to the dominant auditory
dimension I found with my auditory experiments with Danish vowels
(Fischer-Jørgensen 1967)].