# NEW PATHWAYS IN LINGUISTICS

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# I.

# Towards an interdisciplinary paradigm in linguistics

**Stanisław Puppel**

# COMMUNICOLOGY: REMARKS ON THE REEMERGENCE OF A PARADIGM IN COMMUNICATION STUDIES

## 1. Introduction

Communication studies have long been present in scientific research and teaching curricula in the academic centres all over the world. In fact, at present no university can afford to ignore the presence and social relevance of communication studies. This fact has been additionally prompted by the growing practical needs concentrated around the notion of 'communication' and shaped up by the rapidly changing sets of priorities emerging in the global human community in general, and particularly tailored by the growing diversity of practical professions which require the presence of various more or less advanced communicative skills. That is why a look at any randomly selected university catalogue of academic courses offered each year leaves no doubt as to the prevailing nature of communication studies which simply permeate the entire academic *parcours* and continue to accompany other more technical subjects in a variety of disciplines.

As has been stated above, such a general tendency which has been demonstrated on a massive scale, coupled with a really vigorous and multifarious research work on practically every single aspect of communication, may thus be regarded as sufficient in developing the need to postulate the formation of a separate and autonomous area of communication studies, referred to as 'communicology'. The latter may be naturally opposed to the more traditional and much narrower area of

linguistics (i.e. 'language studies'). Having this in mind, let me organize the paper in such a way that it will be set to reflect the present global shape of communication studies. Thus, the paper will be structured into two parts: part one is entitled 'The scope and tasks of communicology' and is focused on delineating the basic premises of a communicological model of human communicative interactions, while part two which is entitled 'The applied nature of communicology' will briefly concentrate on the specific and more practical areas and problems addressed within the paradigm of communicology outlined in part one.

## 2. The scope and tasks of communicology

The very name 'communicology' is not new, for it has been around at least as early as 1978, when Joseph A. DeVito wrote the first academic textbook on communicology. The term was further reestablished in Richard L. Lanigan's important publication in 1992. In these major publications the term was applied to a multi-faceted study of human discourse and communicative interactions and practices in diverse (both external and internal) environments. Thus, although the term was not in a very broad use in communication studies abounding in the burgeoning research of the following years, its very existence had not been disreputed in any way. Today, it seems appropriate to propose that its truly comprehensive domain makes the term a very convenient cover term for research work which clearly exceeds studies conducted within the narrower domain of linguistics proper, irrespective of the extension tag attached to it (e.g. pragma-, socio-, ethnolinguistics, etc.).

This brings us immediately to the need of presenting a reasonable justification for the relatively young discipline of communicology *vis-à-vis* the firmly established and celebrated science of linguistics. Thus, a proper way of doing justice to the term would be by introducing the notion of 'semiosphere', first coined and proposed by Yuri Lotman who did so under the influence of Vladimir Vernadsky's (Russian prominent mineralogist and geochemist) popularization of the notion of 'biosphere', first coined by Franz Eduard Suess (1875). Suess' definition of the term was the following: 'the place on earth's surface where life dwells'. The term, which in the original author's rendition of it combined the concept of the earth's surface with the metaphor of the dwelling, was elegantly utilized in Lotman's definition of 'semiosphere' who defined the latter in the following way (1990:123):

> *A schema consisting of addresser, addressee and the channel linking them together is not yet a working system. For it to work it has to be 'immersed' in semiotic space. All participants in the communicative act must have some experience of communication, be familiar with semiosis. So, paradoxically, semiotic experience precedes the semiotic act. By analogy with the biosphere (Vernadsky's concept) we could talk of a semiosphere* (emphasis mine, SP), *which we shall define as the semiotic space necessary for the existence and functioning of languages, not the sum total of different languages; in a sense the semiosphere has a prior existence and is in constant interaction with these languages.*

Moreover, Lotman's approach to the semiosphere as an ever-embracing and ever-present 'canvas'(or the Batesonian 'matrix'), as it were, for the entire interactive semiotic potentialities present in Nature, and particularly strongly present in man's linguistic capacities, is supplemented in the present paper by the inclusion of the great Peircean tradition of interpreting all the signs as falling into the triadic pattern, which is also referred to here as 'the signifying grid', comprising the index, the icon, and the symbol. In this way, both linguistics and communicology are properly framed by the entirety of the signs. However, it should also be added as a caveat that the only and essential difference between the two disciplines lies in the ranges which both disciplines propose to consider as relevant for their research practices with regard to the signifying grid. Namely, linguistics, with its obvious emphasis on the conventional, arbitrary, and thus fully symbolic code and its uses, is vitally concerned with the symbol as the major point of reference, while the icon and the index are most naturally considered as becoming decreasingly less essential. Thus, one may venture to say that linguistics generally approaches the signs present in the signifying grid in a rather restricted manner, at the same time attributing major relevance to the symbol as such. Communicology, on the other hand, does not show any such restrictions in its approach to the signs and its interest in the universal 'signing canvas/matrix', that is, the semiosphere, appears unperturbed and unconditionally unlimited.

One may thus at this point summarize the situation by stating that the semiosphere may from the perspective of the human observer be understood as having two extensions, the language-centred extension, with its emphasis on the symbol, and the communication-centred extension where all the signs appear to be of equal importance. In the latter sense, it should be admitted that Lotman's semiosphere resembles Ralph Waldo Emerson's understanding of Nature as a system

of signs regarded as open to an infinite number of interpretations entirely dependent on the individual human observer acting as a semiotic interpreter. The entire system of linguistic-communicological interfaces, referred to as the linguistics-communicology system of interdependencies (LCSI), is shown in the diagram below.

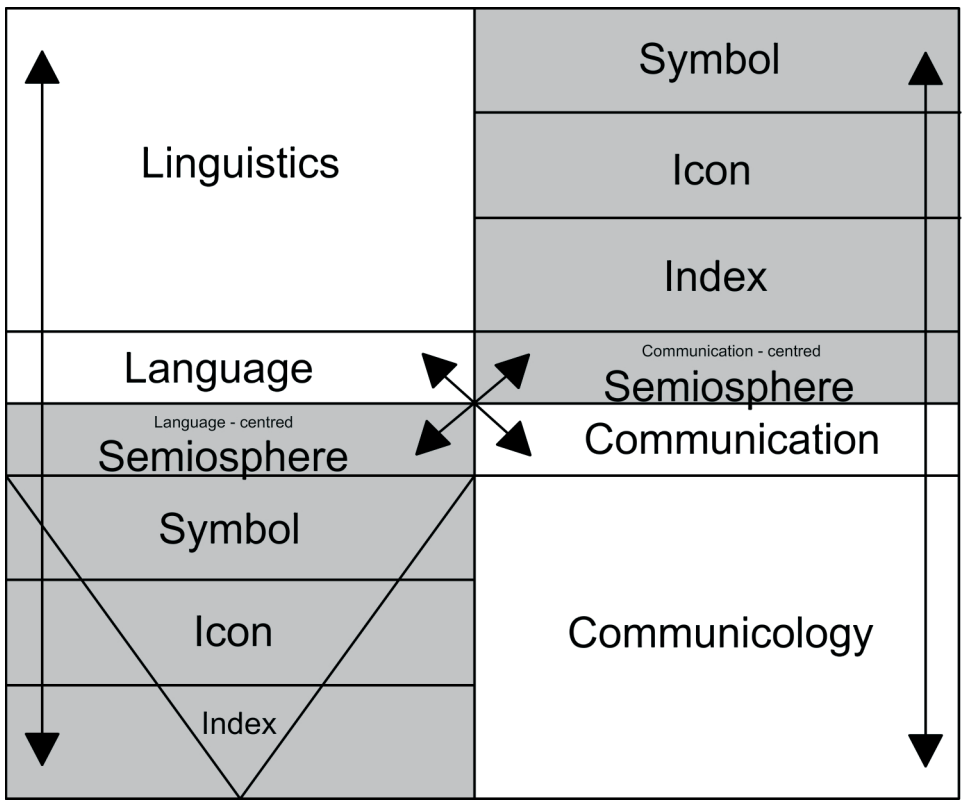



Fig. 1
The Linguistics-Communicology System of Interdependencies (LCSI)

The above diagram expresses the LCSI in the form of the structure and dynamism of interactions between the disciplines of linguistics and communicology on the one hand, and across the vertical layerings of the respective domains of linguistics and communicology, on the other. The said dynamism is expressed by means of a system of bi-directional arrows, referred to here as the Interdependency Generator (IG), which may be extracted to a schema represented by the following diagram:

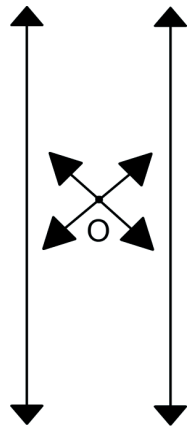



Fig. 2
The Interdependency Generator (IG)

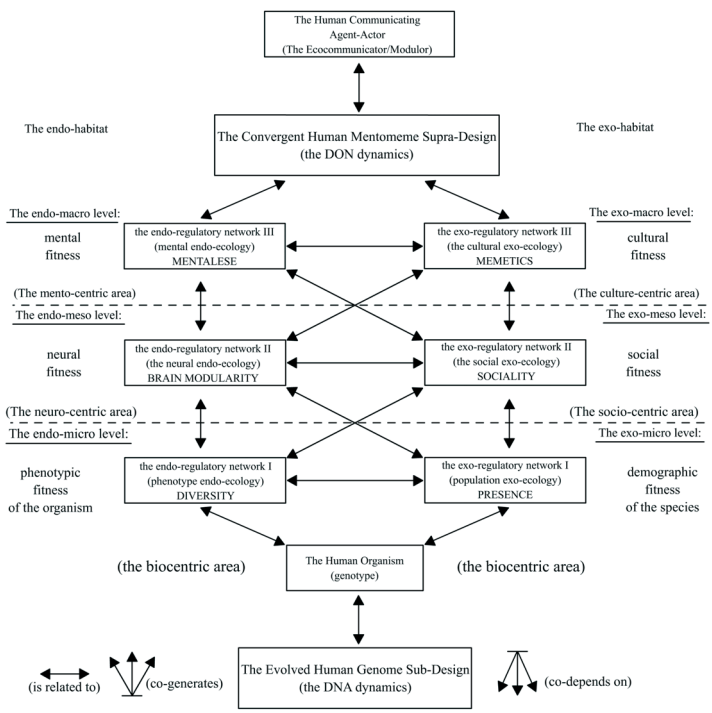
Where 'O' represents the human observer whose ontological status is holistically co-determined such that it comprises both the dual status of an autonomous subject (i.e. the human observer *qua* communicologist) and an object of research (i.e. the human observer *qua* communicator) (see the Basis, Fig. 3 below). Moreover, the arrows represent the possibilities of making various trajectories within the LCSI, while the gray areas indicate the structure and range of the signifying grid. The above schema is thus regarded here as representing an algorithmic device capable of generating particular dependencies within the entire LCSI, owing to the particular moves that can be made by the human observer *qua* communicologist in the overall navigability network of the IG.

Thus it is assumed that within this model, the human observer *qua* communicologist is most naturally and most appropriately involved in research work on the general subject matter of the human observer *qua* communicator. The latter, who is more precisely referred to here as 'the human communicating agent-actor' (or ever more generically as 'the ecocommunicator' or an optimal 'modulor'), is regarded as being determined by interdependencies operating across the natural (and thus inevitable) coalition of biocentric, socio-centric, and culture-centric levels together with the entirety of their interrelated variables and necessary feedback mechanisms. The outcome of the model, which is based on the equally necessary architectural and dynamic design of biological, social, and cultural co-determining factors, appears to be the integrated human

communicating agent-actor (hence HCA). Subsequently, the HCA, who is also co-determined by the environment referred to as 'the endo-habitat' (i.e. the internal environment) and 'the exo-habitat' (i.e. the external environment) in which the HCA is immersed, is capable of generating patterns of socio-cultural and highly adaptive behaviour by self-organization and via self-reinforcing interactions both across the levels (i.e. intra-HCA interactions) and between/among the HCAs (i.e. inter-HCA interactions). The structure and dynamism of the HCA is shown in the diagram below.

The Basis

The species-determined general architectural design of human communication:
The columnar interactive network design




endo-ecology (endo-adaptability):
states and processes within the organism ⟶ endo-fitness

exo-ecology (exo-adaptability):
states and processes outside the organism and relating to the organism ⟶ exo-fitness

Fig. 3

Where the blocks and the arrows represent a highly complex, highly interactive and highly adaptive reality and efficacy of the various self-organizing transactions unfolding into a dynamic and endless web of interrelated biological-social-cultural variables which characterize every single HCA as a cognitive and interactive-communicative entity immersed in the semiosphere understood as the ultimate environment.

In light of the above remarks, one may at this point venture to define the discipline of communicology in the following way:

*Communicology is the study of signification across all levels of the signifying grid of the semiosphere and with reference to the entire bios. Moreover, in its narrower human confines, communicology concentrates on the richness of the interactive/communicative potential of the embodied human communicative agents-actors (i.e. the ecocommunicators) determined by the biological-social-cultural levels and involved in the processes and diversified acts of communication carried out by means of bodily expressive (i.e. production) modes which are most relevant for human communicative behaviours. Furthermore, within this expressive potential, communicology focuses in particular on the following levels of communication: the intrapersonal level of communication, the interpersonal level of communication, the group (i.e. social) level of communication, and the intergroup (i.e. transcultural) level of communication.*

## 3. The applied nature of communicology

It should be admitted that the genuine breadth of a given discipline is always recognized and best estimated while based on the volume of its applicational domains on the one hand and on the power of its interdisciplinary character, on the other. Communicology is no exception to this principle and one may easily notice that in its more practical guises it presents itself as a highly blended discipline. Its transdisciplinary nature has so far been demonstrated through the discipline's energetic and successful attempts towards completing the task of constructing a broad launching pad for understanding human communication in as full a way as is only possible. Obviously, this important assignment could only be accomplished under the condition of maintaining a truly transdisciplinary research and practices. Thus, the scope of communicology has so far included in a complementary fashion a host of other disciplines. Among them, one can distinguish the following theoretical and applied areas of interest within the said discipline: linguistics (including the following sub-branches: general, comparative, historical and descriptive linguistics, as well as anthropological linguistics, pragmalinguistics, psycholinguistics,

sociolinguistics, ecolinguistics, ethnolinguistics, language geography, language planning and language policy), anthropology, biology (especially ecology), architecture, economics, geography (including population geography), psychology, sociology, cybernetics, philosophy (especially epistemology and ontology), political science, systems theory and statistics.

Such a rich and diversified mosaic of collaborating disciplines as the one outlined above has been designed to make research work within the area of communicology as multi-faceted and as exhaustive as possible. At the same time, it seems that its very practical outcome, as mentioned in the introductory part above, has been in providing performative assistance to the human communicators, both acting individually and acting within larger social clusterings, in becoming the ecocommunicators, that is, very much in the style of Le Corbusier's 'modulors' in architecture, the communicative 'modulors', representing efficient, successful, and comfortable agents-actors (i.e. performers) capable of optimal communicative performances in a plethora of communicative acts and contexts, both spontaneous and socially commissioned.

A cursory look at what communicology has been offering in its practical guise may serve to illustrate its breadth and insistence on providing massive assistance to the domestic and international communicators alike in different communicative contexts and modes. Below is a selected list of topics:

1. adaptation of linguistic resources to communication situations and audiences
2. advertising
3. advanced public speaking
4. advanced technical writing
5. audience analysis
6. autism and communication
7. bargaining and negotiations
8. basic speech communication
9. business and professional speaking
10. communicating religion
11. communication disorders
12. communication and conflict
13. communication and economy

14. communication and ethics
15. communication and ethnic groups
16. communication and gender
17. communication and health
18. communication and organizations
19. communication and technology
20. communication in virtual reality
21. computer-mediated communication
22. consultancy skills
23. control of the use of language resources at different levels of discursive interaction
24. crisis communication
25. family communication
26. global, international and intercultural communication in organizations
27. group interactions
28. information management
29. infrastructure of the information age
30. instructional communication
31. interpersonal communication
32. journalism
33. legal aspects of communication
34. marketing communications
35. management of communication activities in the public sphere
36. mass communication
37. media technology
38. medical interaction
39. multi-national communication
40. nonverbal communication
41. political and social communication
42. principles of public relations
43. propaganda and public opinion
44. psychology of media communication
45. small group and team communication
46. socio-cultural bases of communication
47. telecommunication policy
48. theories of persuasion
49. virtual communication
50. visual communication.

## 4. Conclusions

The present paper has focused on an introductory presentation of the discipline of communicology. Its definiton has been proposed. Moreover, a view has been expressed that its interdisciplinary character may serve as a strong warranty of its ever-encompassing scope and may thus serve sufficiently well the purpose of multi-faceted investigation into the nature of communication in general and of human communication, in particular. Thus, the true character of communicology *vis-à-vis* linguistics appears not as a preemptive one but as the one which is capable of providing a much broader perspective on the interactive/communicative potential of the human communicator.

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**Aleksander Kiklewicz**

# Language functions in the ecolinguistic perspective

## 1. Introduction

The methodology of contemporary linguistics has at its basis the idea of the functional syncretism of language: a multitude of interconnections between language and its context — physical, social, psychological, cultural-historical etc. — conditions the emergence of language functions with reference to the material reality, the society, communicative situations or to interlocutors (cf. Pazuchin, 1963: 94). Functional properties of language are so diverse, falling into so many categories, that it seems impossible to encompass them into one coherent theoretical model; at least the task seems to be beyond the capabilities of contemporary language studies. Consequently, it is reasonable, or even essential, to differentiate between two categories of language functions:

1. general functions, which find their reflection at the systemic level;
2. specific functions, which are reflected in linguistic units, i.e. phonemes, morphemes, lexemes, sentences and texts.

According to another primary postulate in contemporary functionalism, language functions cannot be featured or classified on the basis of the speech acts structure alone, which was proposed in classical theories of Bühler or Jakobson; the traditional classifications were neglecting such vital functions as the cultural, cognitive, constitutional or ethological ones, which are discussed in the subsequent sections, and which are highlighted by Leont'jev (1969: 29).

In the theory of language, it is the endocentric or compilational approach to language functions which is predominating. In this approach, general functions are founded on specific functions of language

deriving from them. However, it has to be noted that, on the one hand, there are functions in the systemic approach which cannot be reduced to functions of language units, the constitutional function being an example here (which is investigated in the following part of the present analysis). On the other hand, there are specific functions which are not reflected in the language system perspective, i.e. the signifying or distinctive function of phonemes, or the junctional function of the sentence; what may be recursive are singular rules governing both the units and the system. As a consequence, in the complementary exocentric approach, we can identify two types of language functions:

1. additive — based on the functions of language units; with reference to this type, one can cite Grzegorczykowa who maintains that 'to talk about the functions of language is to agree to a certain analytical shortcut: that the function of language resolves itself to the construction of texts of a certain function' (1991: 7);
2. emergent — characteristic of language as a system.

While considering the emergent function in the exocentric approach, language is perceived to be an ecological phenomenon. The term 'ecology' was introduced into the language studies by Haugen in 1970. In the present-day linguistics the term ecolinguistics is more and more frequently and eagerly used to refer to the orientation in linguistics which investigates ethnic languages in both the synchronic and diachronic perspectives, language contacts and language conflicts, language policy, involving language planning in particular, etc. (cf. Fill, 1993).

## 2. Language functions in the ecological perspective

In the earlier study (Kiklewicz, 1999), I singled out three parameters to classify the functions of language: the world, referring to the influence scope of the signs of language; the sender, denoting the active agent in language operations; and the addressee, who is the carrier of language. However, a verification of the model has to be undertaken in order to optimize the proposed classification of language functions. Consequently, the register of the criteria is to be extended to include six parameters, in relation to which language realizes itself as a functional system:

1. world as the material, social or psychological reality;
2. man as the individual or collective agent;
3. interaction being the cooperation of the subjects;

4. discourse as the interaction event including such aspects as the interaction scene, setting, time, attributes used and assisting codes;
5. convention being the value system which, to a greater or lesser extent, is shared by the interlocutors;
6. language situation as the totality of language systems used, together with their social variation and functional styles cultivated in the social communication, within a given geographical-administrative community.

The functional relevance of language is realized in two aspects: explicational and procedural (similarly, Makarov distinguishes between two modes of discourse realization; cf. 2003: 157). Explication refers to the ways in which physical, social, psychological or institutional aspects of the reality are represented both in language signs and in language use. The procedural aspect, in turn, otherwise referred to as 'instrumental', concerns the use of language as a tool in all types of activities.

A set of language functions, which is graphically represented below (see Diagram 1), can be axiomatically synthesized into twelve primary language functions. The set includes the following:

1. nominative
2. magical
3. deictic
4. expressive / interpretative
5. sociative / symbolic
6. pragmatic
7. stylistic
8. ethological / heuristic
9. cognitive /cumulative
10. creative
11. constitutional / distributional
12. deterministic / initiating.

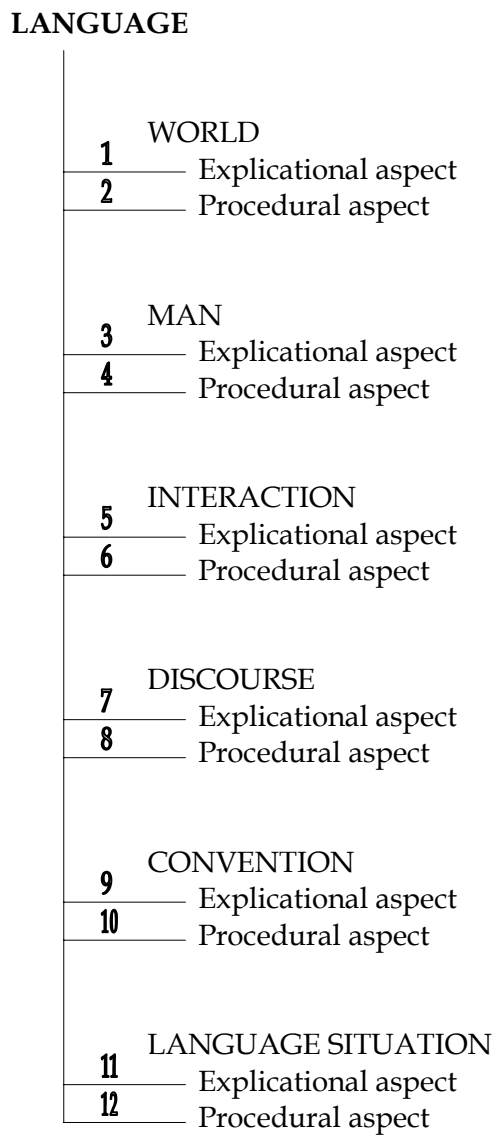


Diagram 1. The parameter-oriented model of the language functions

## 3. Language functions: general characteristics

### 3.1. Nominative function

The nominative function, alternatively named representational, semantic, ideational or extensional, is specific to the Homo sapiens species and allows for the assignment of linguistic signs to elements of the reality. So, by means of sentences we reflect the nature of objects and events, including both concrete / referential or generic utterances:

*W tej chwili Jan jest w pokoju. / At this moment John is in the room.*
*Medalion to okrągła, owalna, ujęta w ramy płaskorzeźba lub malowidło. / A medallion is a round, oval, framed bas-relief or painting.*

As the concept of 'the reality' encompasses a collection of possible realizations, apart from the physical reality there being the social, mental (cognitive or categorizing), emotional, physiological or verbal reality, we can identify a number of subfunctions within the nominative function. Namely, there is the nomination of physiological states (sentence a), the nomination of emotional states (sentence b), the nomination of mental states (sentence c), or nomination of linguistic states (sentence d):

(a) *Jest mi zimno. / I'm cold.*
(b) *Magda boi się siostry jak ognia. / Magda is scared stiff of her sister.*
(c) *Jan uważa, że partie narodowo-socjalistyczne nie wygrają wyborów. / John thinks that social-nationalist parties will not win the elections.*
(d) *Podobną do dopełniacza funkcję pełnią przymiotniki relacyjne. / Relational adjectives have a similar function as genitive.*

### 3.2. Magical function

A belief in the natural relation between linguistic labels and objects labeled, that carriers of language hold, lies at the basis of the magical function of language. The magical function is realized in the belief that names of objects constitute integral parts of these objects. This aspect was analyzed by Vygotsky. In his excellent book *Thought and Language* Vygotsky quotes (after Humboldt) an anecdote about an ordinary man who, while listening to two students of astronomy talking, turned to one with a question: 'I understand that with the help of scientific equipment man measured the distance between the Earth and most distant stars,

learned about their location and movement. But I'd like to know how man learned about the names of these stars?' (Vygotsky, 1982: 311).

The magical attitude to language is the result of physical determinism, that is, the belief in the metaphysical powers of names and the resulting potential of these names to serve as tools of mediating the reality around. This language function finds its reflection in such linguistic activities as spells, wishes, curse, fortune-telling and other. The magical function is also realized in taboo language, i.e. in 'avoiding linguistic labels which are uncomfortable for some reasons' in propaganda texts (Majkowska, 1988: 116).

### 3.3. Deictic function

The deictic function, otherwise referred to as symbolic, or as Kurkowska has it — presentative, resolves itself into the identification of the language user, his/her assimilation with a given social group, or an indication of membership in this group. This language function can be referred to as s o c i o l e c t a l, as it reflects a variety of sociolects within a given language. Sociolectal variation depicts the way a national language is adjusted to different social groups, institutions and individual language users. A situation-driven preference for a particular form of language constitutes a manifestation of the language user's membership within a chosen cultural community. The deictic function is correlated with the societal function as the manifestation of the socio-cultural category usually has a bearing on the distribution of roles among participants in the interaction.

### 3.4. Expressive function

The expressive function allows the language sender to express his/her intentional states, hence this function is alternatively labeled the intentional function. What is vital, this function can be related to the sender's both emotional and rational attitudes towards the semantic content included. The following sentence illustrates the expressive function of language:

*Ciekawsze, że 'GW' poinformowała, iż jeden z zabójców w parę godzin po morderstwie służył jako ministrant do mszy* (K. Czabański). / *What is even more interesting, Gazeta Wyborcza daily wrote that several hours after the murder one of the killers was serving at the altar during a mass.*

In the above sentence there is an emotive operator, that is, an adjective, or a predicative *ciekawsze*, which describes the emotional state of the message sender as determined by the social event which is described.

What is noteworthy, there is a discrepancy between the nomination of mental states of man or animal, which constitute a realization of the nominative function, and the intensional quality of the utterance or text. In his theory, Bühler formulated a rather non-specific definition of the expressive function: 'The sign (..) is a symptom (a marker, idicium) founded on the relation with the sender whose inner state it expresses' (2004, 29). The above definition does not indicate the character of the relation between the inner state of the sender and the sign, consequently, we should regard the status of utterances with intensional predicates as non-specific.

*Wiem, że rząd poda się do dymisji. / I know that the cabinet will resign.*
*Wierzę, że rząd poda się do dymisji. / I believe that the cabinet will resign.*
*Cieszę się, że rząd poda się do dymisji. / I'm pleased that the cabinet will resign.*

These intensional predicates may be treated as the realization of the nominative function, i.e. specifying a person's mental states; or the realization of the expressive function, the intensional modality in particular, which is discussed in my earlier studies (Kiklewicz, 2004).

The differentiation between the nominative and the expressive functions rests upon the ability to employ in an utterance the true-false analysis. Nominative language signs are open for such an analysis, while expressive signs usually block such processes, which is shown in the below illustrations in the Polish language:

*Jan przyjechał – Nieprawda, że Jan przyjechał. / John has come. It's not true that John has come.*
*Ciekawsze, że Jan przyjechał – *Nieprawda, że ciekawsze, że Jan przyjechał. / It's even more interesting that John has come. * It's not true that it's even more interesting that John has come.*
*Być może Jan już przyjechał – *Nieprawda, że być może Jan już przyjechał. / Maybe John has come. *It's not true that maybe John has come.*
*Nie do wiary, żeby Jan przyjechał – *Nieprawda, że nie do wiary, żeby Jan przyjechał. / It's unbelievable that John has come. *It's not true that it's unbelievable that John has come.*
*Niewątpliwie, Jan już przyjechał – *Nieprawda, że niewątpliwie, Jan już przyjechał. / Undoubtedly, John has already come. *It's not true that undoubtedly John has already come.*

Similarly, Karolak distinguishes between modal and non-modal (extensional) use of certain predicates. In modal expressions, which realise the intentional function, 'no other person than the sender of the message can function as the personal argument constituting the thought, and the op-

erator representing this thought' (2002: 225). Conversely, in extensional sentences, 'when connected with second or third person the same predicate becomes the predicate of subordinate proposition (dictum), which demands supplementation with modality' (ibid.). However, in the following sentence the adjective 'przekonany' (convinced) functions as a fully autonomous predicate of the higher order:

*Jestem przekonany, że prawdą jest to, że ten człowiek jest niewinny. / I'm convinced that it is true that this man is innocent.*
*Obrońca jest przekonany, że prawdą jest to, że ten człowiek jest niewinny. / The barrister is convinced that it is true that this man is innocent.*

In another sentence, following Karolak's line of argumentation, the formal predicate 'jest przekonany' (is convinced) gives the possibility of supplementing the sentence with the modal verb in first person:

*Jestem przekonany, że prawdą jest to, że obrońca jest przekonany, że prawdą jest to, że ten człowiek jest niewinny. / I'm convinced that it is true that the barrister is convinced that it is true that this man is innocent.*

### 3.5. Sociative function

The sociative function displays social relations within an interaction. According to the theory of the Palo Alto school, it is nonverbal signs that dominate this aspect of interpersonal relations, informal communication in particular (cf. Watzławick/Beavin/Jackson, 1972).

The sociative function has two variants, namely, it is realised as an integrating function or as a disintegrating one. In the first case, the sender manifests his/her social solidarity with the receiver, and the linguistic message serves as the linking factor, as it 'creates the social group' and 'builds a bond between individuals and the community' (Grabias, 1997: 135). The information of this type follows on the process of recoding, when the sender consciously or subconsciously chooses a proper register and modifies his/her coding of the message in order to reflect optimally the social relation between the interlocutors. For example, in Austrian Kärnten it can be observed that users of the literary language automatically and naturally switch the code to a dialect or the regional language in personal, family communication. Correspondingly, in Pomerania (the Polish seacoast region — Pomorze) the Polish language is replaced by Kashubian in family communication. In similar situations, a dialect understood as Bachtin's 'my word', is interpreted as the language of

the childhood, the regional language, or the family language; such linguistic choice creates an intimate, cozy atmosphere of conversation.

Using the McLuhan's terminology (2004: 57), the literary language may be treated as a 'cool' or low-definition medium, while a dialect as a 'hot' medium, enhancing the sense with 'high-definition' factor. This approach does not exclude the integrating function of literary language, which realizes itself in a higher-level interaction being a symbol of a nation's identity.

The disintegrating function of language, in contrast, otherwise referred to as dissociative, consists in manifesting the membership in a different social group and in expressing the cultural distance towards the addressee or the surrounding. The act of breaking a taboo or any conflict with the language custom are the examples of the disintegrating function manifestation. Accordingly, obscene language which collides with the language convention may be regarded as a gesture of disrespect or disapproval. A frequent cultivation of obscene expressions in Pushkin's writings was reflecting a corresponding tendency in the Russian language at the beginning of the 19th century. This linguistic process was regarded as the manifestation of anti-Russian, pro-European cultural orientation of the progressively-minded part of the Russian society.

The deictic information, ideological in particular, which is communicated in either overt or covert linguistic forms i.e. in the organizational aspect of the discourse, was studied by the English school of critical linguistics in the 70's and 80's of the 20th century, represented by such names as Fowler, Hodge, Kress, Mey and other. The analyses of the category of subject, the category of person or the category of voice are particularly interesting.

### 3.6. Pragmatic function

The pragmatic function, otherwise specified as impressive, performative, or illocutionary, is expressed in the sender's endeavor to shape social relations, particularly his/her own behaviour towards the receiver or the receiver's actions as such. What is to be affected through the pragmatic function is the physical / motor or mental behaviour, including behaviour related to the speech act realisation i.e. in such rejoinders as: *Zamilcz!* (*Be quiet!*). The pragmatic function as proposed in the current analysis encompasses two functions of the utterance which, following Grzegorczykowa's proposals, are the causative function and the persuasive function (1991: 23).

Language as a means of exercising social impact remains within the scope of interest of pragmalinguistics. The linguistic tradition which crystallized on the basis of the speech acts theory proposed by Austin and Searle in the 60's and 70's of the 20th century, is of intention-centric character, so it is founded on the criterion of preference of intentional linguistic actions. An alternative direction in the research involves non-intentional pragmatics, i.e. investigating reactive, conventional and ritual use of language, which is studied by Nuyts (1997) and which is to be analysed by dispositional pragmatics (Kiklewicz, 2007: 111).

Another important aspect in the analysis of the pragmatic function involves the acceptance of a wide spectrum of communicative situations. In traditional pragmalinguistic theory it is interpersonal contacts which are of primary importance. While interpersonal relations allow the feedback reaction, in the communication 'across species' i.e. in the communication dyad man — animal, or in mass communication, the possibility of receiving feedback is limited if not unattainable. Furthermore, a communicative relation of the reader and the text constitutes a separate case: here, the interpretation of the pragmatic function is conditioned by, first, pragmatic indexes coded in the text, second, by the perceptual basis of the receiver, with the knowledge about the author of the text and the context behind the process of writing the original (cf. Fleischer, 1990). In the contemporary literary studies this phenomenon is analyzed in methodology based on biographical analysis (cf. Cysewski, 1994: 273-274; Rzepczyński, 2004).

The pragmatic function encapsulates certain specific functions, for example the artistic / poetic function based on the idea of the influence on the receiver in order to evoke the esthetic sensations i.e. through the application of phonetic measures such as alliteration or dissonance.

In indirect speech acts we can notice another specific function, namely the eliminating function. Basically, it is founded on the process of hiding the information, in order to make it unavailable to the unwanted observer of the speech act. Sociolinguistics in such instances introduces the category of secrecy, which is analyzed among others by Grabias. The scholar defines secrecy as 'the process of coding the information and making it accessible only for the chosen receiver' (1997: 155). The theft sociolect is characterized by the highest level of secrecy, while i.e. student, hunting, or raftsman's sociolects, together with the play_code of children are described as half-secret. In such instances, the isolation of

the third party is a deliberate strategy to create and cultivate a language variety.

The eliminating function is sometimes realized in foreign language use. As an illustration, at the beginning of the 18th century the Russian emperor Peter the Great was encouraging his compatriots to speak foreign languages, as this strategy enables a conversational blackout eliminating a third party from the conversational relation.

### 3.7. Stylistic function

Linguistic communication can be both sociosyncratic and idiosyncratic. In changing conditions of linguistic activity, a process of 'explosion' (following Barthes' terminology) of the language system takes place, which equates splitting the language form and meaning. This separation is conditioned by the type of the discourse.

The stylistic function has it that we can find the reflection of types of discourse — interpersonal contexts — in the form, structure and meaning of linguistic units. Types of discourse, in turn, parameterize the interlocutors, types of communication procedures, the scene and surrounding of the communication situation, the relation between the partners, the atmosphere of the cooperation between the partners, etc. (cf. Nęcki, 2000: 94). The utterance is described by the stylistic function if it has the features of the external conditions of communication, and if it passes the information about the speech act. Below we have different forms of farewell in Polish, which either express the familiar, polite or neutral attitude of the speaker towards the addressee:

*Do widzenia! / Good bye!*
*Do zobaczenia! / See you!*
*Na razie! / Hi!*
*Cześć! / Bye!*
*Trzymaj się! / Take care!*
*Muszę już pana pożegnać! / I have to say good bye!*

The idea of standard language, being an object of investigation for a large group of linguists, in fact remains a scientific abstraction, as what we actually observe are styles, sociolects and more or less regular 'techniques of speaking' (Roben, 1999:191). It has to be taken into consideration, though, that the degree of stylistic markedness of linguistic units is divergent.

Communicating and decoding of the stylistic information constitutes the norm of the linguistic behavior (Konjuškevič, 1998: 29). According to the theory of Neurolinguistic Programming, there are forms of cognitive pathology i.e. schizophrenia, which involve the person's inability to determine properly the frame of conversation and to identify the interaction type in the form of the linguistic message (Walker, 2001: 76).

The obligatory character of the stylistic function of a sentence places the function among the language education objectives, foreign language education in particular. A widely used rule in contemporary glottodidactics involves the idea of 'immersing in the language environment' (Murzin/Smetjuk, 1994). Siatkowski (2001: 55) says that stylistic features of linguistic utterances constitute an essential factor in the confrontational and typological analysis of languages.

Neščimenko (1999; 2003) in her theory proposes three levels in the division of the communicative environment: a) areas, b) spheres, c) communicative situations. Depending on such parameters, as social contact, functions of the message, the interaction aim etc. Neščimenko identifies two primary communication areas: a) the area of high communicative functions, b) the area of natural, everyday communication.

The communication of the first type, as proposed in Neščimenko's model, involves a characteristic rationing, as well as extrinsic control and the linguistic self-discipline of speakers. In everyday communication, conversely, language self-control on the part of the speaker is low or none; additionally, low linguistic control is characterized by a high level of expressiveness.

The reality of linguistic communication today not only involves the idea of language carriers having several language styles and types at their disposal, which according to Neščimenko can be regarded as a type of diglossia; but it also involves the idea of multi-directional spread and absorption of elements of divergent social forms of language. The scholar describes this phenomenon as 'the continuative character of the system of ethnic language' (Neščimenko, 1999). Generally, the stylistic differentiation of language communication undergoes obliteration (Vinokur, 1993: 65), which finds its reflection in the literary collage (Nycz, 1993: 195), or in the syncretic realization of journalist genres being a consequence of the process of genre mutation. The process of referring to different genre forms eventually brings hybrid texts (Wojtak, 2004: 18; Wolańska, 2004: 104).

### 3.8. Ethological function

The ethological function of language also referred to as ergonomic or heuristic, concerns the organization of a discourse, the language text in particular. Accordingly, Halliday writes about the textual function in the context of the optimization of communicative behaviors (cf. 2002b: 23). Furthermore, Nuyts (1997: 53) assigns the organic category ('die organische Funktion') to the ethological function. The scholar is interested in the way language realizes the pragmatic function or the 'role function'. Leont'jev introduces the term diacritic function (1969: 38).

On the level of hyper discourse, i.e. within such categories as 'society' or 'state', the ethological function is realized as a primary tool in institutional functioning, so literary languages — their written forms — are assigned the institutional or state function. In this context, it is essential to notice the constructivist theory of communication, particularly Fleischer's proposals, who regards communication as 'the organizational modus of the society'; 'the social system is not composed of individuals (..) nor of the population, but it is built out of communication events created through the communication mechanism' (Fleischer, 2007: 50) .

In the interpersonal discourse, it is recreational or, as Norman names them, 'hesitational' operators which are perceived as a special realization of the ethological function (cf. Norman, 1994: 192). These are linguistic pause fillers, by means of which the communication subject creates an illusion of the continuation of the communicative action. Parenthetic expressions are considered here; in the Polish language we can have: *wiesz* (*you know*), *widzi pan* (*you see*), *powiedzmy* (*let's assume*) *hm..* (*hm..*), *że tak powiem* (*so to say*) itp. (cf. Kiklewicz, 2004: 224).

Awdiejew and Habrajska, while interpreting the textual function in the light of Halliday's theory, write that operators which organize the information transmission 'facilitate the process of linguistic content reception' (2004: 39). Moreover, they are equally important in facilitating the translation of linguistic content. Such is the function of names which, on the one hand, are a means of nomination and, on the other hand, optimize a person's mental and practical activity. To illustrate, Aureliano - the hero in Marquez's One Hundred Years of Solitude- is striving against the loopholes in his memory by placing self-stick notes with written names of the objects onto these objects. In this way, a word becomes a label, in a sense replacing the assigned object. Later, the labels

are developed and each name is supplied with a concise instruction how to operate its referent.

Another example, this time taken from the industrial reality, may be a trademark — a symbol in the form of a drawing or letter etc. which is placed on a product by the producer to inform about its use. Trademarks just like products themselves are subject to commercial law (Sobolewa and Supernaskaja, 1986: 68).

Echolalia, defined as a continual repetition of what has just been said, as observed in children's communication, serves as another realization of the ethological function of language. Echolalia is an example of egocentric behaviour which, in the context of a child, enables to develop language habit and facilitates language acquisition. Piaget maintained that egocentric behaviours, along with an active use of language, characterize a person's early years of age. In contrast, the socially adaptational use of language in a child's communication amounts to no more than 13 — 14 % of all communicative behaviours.

### 3.9. Cognitive function

The cognitive function of language — also named cumulative, imaginative or cultural — resolves itself into the process of storing the results of one's conceptualized experiences, both of the perceptual and the reflective /emotional nature. Cognitivism in the language studies is based on the idea of linguistic relativism, according to which a person's perception of the reality around is conditioned by the language system. The very approach dates back to the period of German Romanticism of the 18th — 19th c. A classical thesis of Herder can serve here as a commentary: 'Language determines limits and essence of human cognition' (cf. Heinz, 1978: 108). The idea of language relativism is encapsulated in the below diagram:

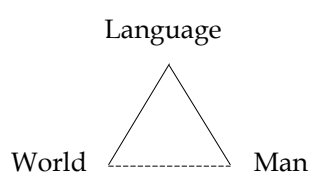


Diagram 2. Language relativism

The cognitive information is partly incoded in the language system itself, particularly in the lexical meanings of autosemantic words, i.e. nouns, verbs, adjectives and adverbs. Most frequently, though, language serves as a means of coding information in texts. Consequently, the German noun Überfremdung, which refers to a surplus of foreign visitors to a country, and which was formed of the German adjective 'fremd' meaning 'foreign', indicates a given social phenomenon in German-speaking countries.

In Polish, the so-called 'mowa kolejkowa' (queue talk) can be pointed to as an indicative example in the context of the Polish economic crisis in the 70's and 80's of the 20th century (cf. Głowiński, 1993: 134). The below list contains several Polish culturally-marked linguistic expressions typical of the queue talk:

*Rzucili szynkę. / Ham came.*
*Co tu dają? / What are they giving here?*
*Wystała mięso. / She queued meat.*
*Wychodziła ser żółty. / She ran after hard cheese.*

As Maćkiewicz aptly notices, 'to a certain extent, knowledge can be included in language' (1999: 21). As a result, the role of the system of language cannot be exaggerated when it comes to the linguistic representation of the world, at least it seems far-fetched to make definite decisions on the basis of so-called lexical loopholes. To illustrate, the Polish noun 'używka' has no symmetrical lexical equivalents in some European language systems (in English we have stimulants, depressants or junk food which in proper contexts can realize this meaning). It is doubtful whether on the basis of this lexical asymmetry we can speculate about a characteristic for Poles categorization of the reality, in this case synthesizing into one category 'food products without nutritional value, sometimes harmful to one's health and bringing stimulating effect, such as coffee, tea, alcohol, certain spices or tobacco'. Similarly, Grzegorczykowa (1999: 34) and Maćkiewicz (1999: 21) warn against a speculative, routine interpretation of historical data from the perspective of cognitive linguistics. As early as in the 1970's, the psychological radicalism in the interpretation of linguistic facts was criticized by Roman Jakobson.

### 3.10. Creative function

The creative function realizes itself in the linguistic activity through the linguistic determinism, i.e. through the language impact, particularly its semantic categories classified by Sapir as conceptual. These categories are subdivided into lexical and grammatical ones and they are to influence non-verbal behaviours of the language user, the specificity of his/her cognitive system, and, generally speaking, culture (one can consider the thesis of the influence of language on morality; cf. Liebermann, 1993; Banich, 2003).

Primarily, one associates the research into the creative function of language with American anthropological school of the first half of the 20th c., and with the names of its two representatives Edward Sapir and Benjamin L. Whorf. Sapir was writing about the heuristic function of language the result of which is that conceptual categories determine the ways of perceiving and categorizing the reality (1993: 270). Correspondingly, Whorf was maintaining that the metaphysics included in a language brings a predetermined perception of the external world and specifies behavioural patterns of the language carriers (2002: 77).

What is worth noticing, as perceived by contemporary science, Sapir's proposals are often reduced to radical psychologism. Although, generally speaking, the assumption of interrelationship between language and mental activity together with the thesis of the cultural content cumulated in language do exist in the scholar's theory, in fact, Sapir was reluctant towards the idea of anthropological absolutism in the language studies. He expressed these views in the critical analysis Language and environment (cf. 1993: 270). Sapir was distinguishing between two separate concepts: 'linguistic activity' and 'thinking'. In his studies, thought categories are included in hidden or potential language content; they can be exposed in the translation process of every element of the lexical stream treated as lexically relevant. Hyperconceptualisation of this type is rather rare in natural communication, as usually it contains a collection of strictly 'technical' or organizational elements, to refer to Jachnow's terminology (1975), which are controlled by the textual mechanism of redundancy. In this way Sapir concluded: language and thought are autonomously demarcated.

The primary role of the creative function of language was highlighted by advocates of neohumboldtism in German linguistics of the first half of the 20th century. So, e.g. Mańczyk writes that in Weisgerber's theory the central

place is occupied by the category of the energetic impact of language in relation to language users who have to 'refer to words and sentence structures of their native languages, which contain already established and determined world order and evaluation' (Mańczyk, 1982: 44).

The creative function of language finds its reflection in the phenomenon of the semantization of grammatical categories. In this context, one can look at the grammatical category of gender in nouns, namely at the secondary personification of inanimate nouns in mythology or in literature. For example, on Russian New Year cards there is a picture of a young man symbolizing the upcoming year; while on Bulgarian cards we can find a picture of a young woman. The explanation is that while the Russian noun 'god' (year) is masculine, the corresponding Bulgarian noun 'godina' is female. Another example of this mechanism in the Slavic mythology includes the semantisation of the grammatical category of number, which is studied by Tolstaja (2001). Moreover, Slavonic languages are characterized by the same folk representation of the concept of death, which in these languages is a female, being described linguistically by the feminine noun. In the German mythology, conversely, death is a man, 'der Tod' being a masculine noun.

The creative function remains pivotal in the text, directly influencing the cognitive system of the receiver. Mass communication involving media, advertising or public relations is discussed as the tool of the educational / modeling function. As Filipiak puts is (2003: 129):

> Mass-media (..) shape certain world views, attitudes and behaviour of receivers through the language of film, television or radio broadcasting, the Internet and the press (..) promote behavioural patterns, lifestyles (..) they satisfy the need for beauty, model the esthetic sensitivity (..) partake in the socialization process (see also Zimny, 2008; Nowak/Tokarski, 2007; Jabłoński, 2007).

Steiner puts it even more radically:

> Communicating the information seen as ostensive, verifiable facts is but one aspect - perhaps secondary- of the discourse. The genesis and nature of speech is marked by the capability to create fiction, counterfactuality, insoluble future (2000: 631).

Carruthers (2002) commented the issue aphoristically: '(..) Language is the conduit of belief'.

### 3.11. Constitutional function

The constitutional function of language finds its realization in language situations. Sociolinguistics defines language situation as a set of languages, social variability in language, and functional styles, which are cultivated within a given administrative-geographical community. Depending on the radius of influence and the spheres of influence, languages are characterized by different constitutional features (cf. Mečkovskaja, 2001); while taking these features into account one can obtain several functional oppositions among languages:

1. codified or written vs. non-codified or spoken;
2. interdialectal vs. dialectal;
3. literary vs. non-literary; the constitutional function in national languages with regard to African literature is discussed by Obi (1996);
4. multiethnic, being spoken by a number of nations vs. monoethnic;
5. state, i.e. formal, official vs. non-state, including local, regional languages, minority or ethnic languages;
6. documentary vs. semidocumentary; the first category containing the languages used in documentation by the Security Council of the United Nations: English, Russian, Arabic, Spanish, French and Chinese; the second category includes German;
7. prophetic or apostolic vs. non-prophetic; the first group containing languages of cult religious texts: Vedic Sanskrit, Aramaic, Old Avestan, Sanskrit, Old Church Slavonic, Classic Arabic, Old Greek, Wenyan (Classic Chinese); the complementary category includes local community languages — vernaculae.

### 3.12. Deterministic function

The deterministic function of language, also labeled initiating, involves the idea of one language influencing the other. There are several types of the influence induction:

1. contact vs. non-contact;
2. one-directional vs. mutual;
3. convergent vs. divergent.

Interference is the result of language contact within a given geographical-cultural territory. This process involves the idea of elements from one language system penetrating another language system, and violations of the system of native language or the language norm which can

happen under the influence of the second language; the reverse scenario of the second language being affected by the native language system is possible as well. However, in the non-contact type of interference, the initiating function is fulfilled by i.e. classic languages which, regardless of their contacts with other languages, have the extra-ethnic status and as a result, leave the traces in other language systems. Latin may be an example here, having influenced languages of Central and Western Europe, or Old Church Slavonic, having left the traces in East Slavonic and South Slavonic languages.

One-directional type of language influence is most frequent, which is illustrated by the initiating function of classic languages, by the influence of French on other European languages in 17th — 19th c., or by the international expansion of English in the 20th as well as in the first decade of the 21st century (cf. Zimmer, 2005: 105; Sick, 2005). As a consequence of mutual influence between languages, one can observe an emergence of language areas or literary languages, which was the case with reference to the Serbo-Croatian language at the end of the 19th century and at the beginning of the 20th century.

Usually it happens that the initiating function of language finds its reflection in convergence processes, i.e. the processes of mutual approximation and imitation between two or more languages. Such was the character of the Russification process affecting the languages of national minorities in the former Soviet Union, which is discussed by Lyč in the context of the analysis of Belarusian spelling system reform (1993, 180). Convergence can lead to the emergence of mixed languages, just as in the case of the so-called 'trasianka' in Belarus, or 'surżyk' in Ukraine; in extreme situations language degeneration takes place.

Divergence usually accompanies decentralizing processes in the national-political history. In the 90's of the 20th century, the phenomenon intensified in the post-Soviet countries, and former Yugoslavia. So, for example, in Belarus we can observe an emergence of an alternative norm of the literary language (Bušljakou/Vjačorka/San'ko, 2005), based on the rules of de-Russification. The intensification of borrowing processes from Polish was the resulting linguistic mechanism (cf. Kiklewicz/Pociechina, 2000; Kiklewicz, 2002). In the countries of former Yugoslavia, even more radical processes took place, involving phonetics, morphology and lexicon, which has been analysed by Hofman-Pianka (2000: 72-73).

The initiating function is based on the process of projecting some forms of one language onto another language. In this relation, two subfunctions are realized:

1. the function of a language-donor: the relation of French to European languages in the 18th — 19th c. may be an illustration here;
2. the function of a language-receptor: the relation of Czech to German in the 17th — 18th c. may serve as an example.

## 4. Conclusions

To summarize, it is worth highlighting that the objective of a scientific analysis, the systematization of the language functions in particular, is to build theoretical, categorical tools to interpret the activity of man regarded as both: an individual language user, and a collective agent i.e. in the sense of social groups of various formats. This task is done by means of language and with reference to language. Strict schematization is not recommended here, as typical axiomatic / logical classifications hardly ever meet the requirements of representativeness as well as appropriateness. An approach founded on induction has not proved optimal either, as functions specified in this way have no clear-cut boundaries, being incoherent on the level of categorization. All in all, this study proposes a relativist perspective: on the one hand, the presented classification of language functions is based on six basic parameters, relevant in the context of language use: world, man, interaction, discourse, convention and language situation. On the other hand, however, the proposed functions of language are specified in a taxonomic way, that is, in the form of an open list. There remains a possibility to extend the list and introduce new functions.

Translation: Marta Bogusławska-Tafelska

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**Marta Bogusławska-Tafelska**

# COGNITIVISM IN LINGUISTICS. WHY SCIENCES ARE TO FALL INTO ONE INTERDISCIPLINARY PARADIGM

## 1. Introduction

In the linguistic literature today one can find almost as many proposals 'to practice' cognitivism as there are scientists willing to contribute to the research; different aspects of human language are dealt with under the banner of cognitive linguistics, which in practice equates studies being more or less proportionally located along the spectrum with structuralism- or rather some form of neostructuralism - on the one extreme and cognitive science in its futuristic, as some say 'metaphysical', mode on the other. As a happy commentary to the situation puts it, language itself is a cognitive phenomenon so all activities with language in the focus are cognitive as such. In other words, even genuinely systemic analyses in the linguistic research, based on the methodological reductionism which is to be recompensed by the mentalist-oriented declarations of the authors, are today granted the obligatory yet promising label 'cognitive'. Much as one values the scientific outcome in question, one has to face the problem of the applicability of neostructuralist approaches in the scholarly pursuit towards the functionally optimal model of 'the human being in the world'. However, the controlling assumption in this analysis has it that a genuine insight into human language, seen as one of the areas of human endeavor and a reflection of human mental potential, is possible only when the science of language moves beyond the present systemic point of view and opens for the interdisciplinary scientific material to

supply and verify its findings. The cross-disciplinary perspective, with the local alliances and 'hybrid' interdisciplinary models, will give linguistics a new momentum; the natural unification tendencies in the language studies, recognizing such paradigms as the quantum theory, or cognitivism comprehended as the multidimensional, complex study of the human condition, aim at interdisciplinary, however not reductionist, solutions to old scientific problems.

In addition, this outline presentation will promote the cognitive paradigm in the linguistic research as the interdisciplinary hence scientifically potent paradigm, which has methodological and philosophical holism as its pivotal qualification; consequently, as it is proposed in this paper, modern linguistics with the interdisciplinary ambitions makes its way towards the higher-level scientific awareness which, as I dare to predict, will one day be realized in one interdisciplinary scientific paradigm, universal for natural sciences; such a unifying paradigm, the metamodel, could function as the key to understand man as a mental-physiological organism being and acting in the world. One may wonder how far we are now from the very scientific and conceptual turnover (Cat, 2007; Penrose, 1995).

There is one precaution that the researcher browsing across disciplines and their scholarly bases has to recognize. Namely, that in this study of man a singular mind will not be able to thoroughly permeate and master himself/herself the totality of aspects involved. The researcher has to admit after one of the first interdisciplinarily-oriented scholars of modern science - Ervin Schrödinger- that

> '(..) we are only now beginning to acquire reliable material for welding together the sum total of all that is known into a whole; but, on the other hand, it has become next to impossible for a single mind fully to command more than a small specialized portion of it' (Schrödinger, 2007: 1).

In consequence, the methodology of the interdisciplinary research in general, and of the current concise study in particular, allow in the author's research results together with the intellectual and scientific outcome of other contributors. The misconception or simplification error probability is, thus, quite considerable, but cannot be escaped. Ultimately, further research will verify all the scientific proposals.

## 2. Unification vs. scientific pluralism

The philosophical issue concerning the best and unitary scientific methodology is traced back to pre-Socratic Greece (Cat, 2007). The first philosophers of science were Parmenides, Heraclitus, Pythagoras, Plato, Aristotle, to mention but these well-recognized names. Their reflections centered on the issue of the nature of the world and the essence of the world matter; the philosophy of science, since the first philosophical treaties put forth, has been investigating whether the world around is a unitary system that needs one explanatory theory; or, conversely, whether a divergent vertical and horizontal structure of the world requires the plurality of scientific endeavor (ibid.).

As both methodologies are appealing and reasonable, it may be useful to accept both; after all, the stratification of the world systems and the hierarchical intra-structured organization of the human organism require the multi-model scholarly method. Hence, the future studies will probably be relying on these promising 'local alliances' that sciences are to enter. At the same time, however, the macroperspective in the research is essential and prevailing; it equates the specification of the scientific method as such. In other words, multi-model local studies fall all under the unification banner of the scientific method being a particular metamodel, which is to offer a macroview on the essence of the world. The present analysis formulates an assumption that, in the microperspective, it is the interdisciplinary effort that constitutes a promising pathway in linguistic and other natural sciences research; while, in the macroperspective, the unification without reduction will eventually result in a unitary scientific paradigm, synchronizing the 'local' research outcome into one coherent vision of the world and man in it. The forthcoming section will be devoted to the locality in modern linguistics resulting in hybrid models, while the section 5 will discuss the reshuffle in the scientific method itself, which is to result in an interdisciplinary unification paradigm.

## 3. Cognitive linguistics as reaching for the anthropological, sociological, neurobiological, psychotherapeutic and AI models

In this section the intention is to present the supraposition of the interdisciplinary research policy in linguistics with all its consequent conveniences; occasionally, this promoted perspective will be

juxtaposed with the contemporary neostructuralist approach, which has the system of language at its focal point without much effort to extend the context. In order to defend the thesis put forth above and show the tendency in natural sciences to form alliances among each other and work over a common denominator to decipher the codes of the living matter and 'non-matter', cognitive linguistics and psycholinguistics will be discussed as the meeting grounds for linguistic, anthropological, sociological, neurobiological, psychotherapeutic and AI models to approximate and exchange data. It has to be noted that the list of contributing paradigms does not end here; the following sections will introduce the newest proposals in linguistics, introducing the quantum theory into the linguistic research being but one of the interesting voices in the scientific debate.

### 3.1 The anthropological culturalism of the mind

Cognitive linguistics recognizes the cultural context as one of the primary contexts to study, while analyzing human linguistic activity. We owe it to anthropological and sociological research that linguistics has agreed to the view on language as a cultural process. When a psycholinguist analyses human language as a cognitive process in which the starting, momentary in nature, parameters of the cognitive system-the message sender – co-work with the intrapersonal and extrapersonal contexts to finally come up with and send the message to some receiving cognitive system parametrised otherwise, one may ask a question about the ontogenetic scenario behind this omnipotent dynamic mechanism; in other words, the straightforward question is how the cognitive system reaches this level of proficiency and what the principles are like which steer the process of the cognitive system registering and reshuffling the data it ultimately does. In order to answer these questions, the cross-disciplinary research has pointed to such anthropological assumptions as the cultural character of the notions of person, value, belief, motive etc. (Wilson and Keil, 1999: cxxviii). An assumption in cognitive linguistics, inspired by anthropology, is that it is culture that constitutes a driving force here. Culture can be defined as an idealized, 'collective' cognitive system of knowledge, values and patterns of behaviour that each community or nation cultivates and passes down to next generations, by means of the shared language to a large extent. Culture is defined as a mental equipment that members of the society have at

their disposal while behaving, making decisions or, simply, sorting out the continuum of the external reality (Wilson and Keil, 1999: 120). Further, *The MIT encyclopedia of the cognitive sciences* notes that the traditional anthropological understanding of culture as relatively bounded and coherent has been revised and, consequently, today cultural unity and influence are discussed in terms of zones of greater or lesser intensities not in terms of chosen nations, communities or tribes (Wilson and Keil, 1999: cxxvii). This dynamic understanding of culturalism is vital especially in the contemporary era of globalism and shrinking distances between nations, people and cultures.

Nevertheless, anthropological models alone will not do the job in the linguistic study of human cognition and language. After all, the cognitive system developing under the decisive influence of the linguistic/cultural community still realizes the potential for the independent self-sustaining and self-organizing construction. Being embedded in the societal framework, people do exercise their individualism. The apparent paradox visible in the conception of man as a cultural/social subject and a cognitive self-system, has to be faced and admitted when an insight into the cognitive nature of human action is to be undertaken. It is well-visible that both points of view, which are the mind as a cognitive process and the mind as a cultural process, have to control the intellectual effort of a modern linguist whose aim is to study the cognitive nature of language.

### 3.2 Neurobiological and psychological models incorporated in psycholinguistics

Modern theoretical linguistics finds its vital applications in language education, the first language acquisition research and the second language education included. Linguistics with the traditionally systemic orientation would not offer much as regards complexities in the first language acquisition process (FLA) or the second language learning/teaching process (SLL). The critical evaluation of the functional potency of the neostructuralist orientation in contemporary linguistics comes from the premise already signaled: methodological determinism searching for the explanations in the systemic analyses of language as a product of vaguely defined cognition will not provide insight into the dynamics of the language processes. Below it will be argued that the current challenges within higher language education in Poland can only

be dealt with by the interdisciplinary approach of psycholinguists and methodologists. It is vital to note that in this brief analysis the higher education context is but an example of any host educational environment in the contemporary Poland which, one will risk a generalisation, face similar difficulties.

In order to discuss the applicability value of the interdisciplinary effort in linguistics, one starts by the insight into the triad relation: the minimal student — the academic teacher —the educational institution. In the last ten years the higher education system in Poland underwent a facelift. The changes were triggered by both: new demands on the job market, and internal systemic reforms forcing evolutionary changes. Consequently, it is not only the psycholinguistic profile of the typical/average student that has changed, but also a number of other elements of the educational ecosystem in the context of the Polish university. For the time being, in numerous respectable colleges across Poland the typical candidate for a student is no longer optimally equipped psycholinguistically and intellectually to start his/her university language education. The Polish higher education system has stopped to be elitist and has started to be public. Moreover, the Polish university has recognized the necessity to accept the rules of a free market, where one's education has become a product to purchase. In the meantime, academics and the educational institution itself seem not to have been prepared for such dynamic and specific changes, as a result, defects within the triad relation in question have induced a crisis in these educational ecosystems. Much as I recommend the local rather than the global approach to these issues, it may be generalized that the Polish educational system today is marked by the growing presence of the minimal learner profile. However, to counteract the situation educators need the methodological support of the interdisciplinary psycholinguistic research; specifically, the ecolinguistic, psychological and neurobiological hybrid models have been built to diagnose the situation and propose solutions. The more detailed study of the minimal learner education can be found elsewhere (Bogusławska-Tafelska, 2006; Bogusławska-Tafelska, 2007). In this section I intend but to signal these issues.

However, when the higher education in Poland started to experience internal tensions caused by the minimal learner dominance, first methodological suggestions came from neostructuralists; they relied on the proposals coming from traditional methodology of foreign language

education. According to this methodology, drawing from the findings of the structuralist research in linguistics, to diagnose or simply describe the language learner one needs the repertoire of psychological and linguistic features that can characterize him or her. Thus, the minimal learner has been studied from the perspective of his/her learner personality features; so, in a sense, the structure of the language personality has been put into the focus of attention. Among the traditionally recognized notions in the methodology of language teaching and learning are such concepts as: extrovert or introvert mode, shyness or self-confidence, openness to risks or reserved behaviour and other. As regards the linguistic features, educators have look at memory predispositions, learning styles or language skills mastered and not mastered etc. In these analyses the presence or absence of each psychological or linguistic variable has been determined and on this basis the methodological help has been suggested. A psycholinguistic model, conversely,willperceive a language ego as a dynamic mental construction. Any analysis of the features rather than mechanisms seems to be an effort to grasp and put to a standstill something that remains in constant motion.

A typical example of this systemic orientation in methodology includes the proposed design of the first-year course of academic writing for English Philology students. When academic teachers, in one of the Polish university departments of English Philology, noticed progressive, occurring from year to year, complex difficulties of students with practicing English paragraph and essay writing, the teachers suggested organizing the first-year course around the English compound sentence writing. In simpler terms, practicing compound sentences in the two-semester course was suggested to help the minimal learner to overcome complex problems with writing in English. One can hardly predict any optimistic results of such a methodological approach. Generally speaking, the philosophy behind such a diagnosis needs a word of commentary, because the very approach seems not to be accidental. Contemporary linguistics no longer defines the process of text writing as parametrised only by the language system involved and its next components, i.e. syntax, semantics or lexicon. In other words, difficulties with writing in English that English Philology students often display involve a number of higher-level cognitive mechanisms which go far beyond the language system itself and even the language production process. The inability to do the writing task does not only

reflect the inability to mediate the grammar, or lexicon of the English language. Problems with creativity, connected with defectively functioning emotional representation and defective self-communication not to mention possible biological malfunctions (such as defective interhemispheric communication involving corpus callosum), problems with mediating the cognitive codes, the epistemic closure domination, and a lack of a helping motivational mechanism, last of all, negative group radiation and the 'minimal' feedback from the disoriented academic teacher will not be worked over through the intensified compound sentence writing (Bogusławska-Tafelska, 2006; Bogusławska-Tafelska, 2007). A psycholinguistic and ecolinguistic study has to, first, analyse this cognitive-emotional-motivational noise in the educational ecosystem, second, propose functionally potent methodology. Only a broad psycholinguistic perspective on the intrapersonal and ecological conditions enables such a diagnosis. One of the assumptions in the psycholinguistic perspective on higher education problems is that the classroom functions as an ecosystem which, with its students' and teacher's contexts, is a dynamically self-organizing and self-refocusing microcosm embedded in the macrocosm of the extraeducational reality. The dynamics, locality and context-relatedness of the educational process, as experienced by the minimal student, needs such a complex multiperspective treatment. The ultimate aim of the proposed here allied, cross-disciplinary effort is to show the specificity and dangers which block the minimal student's educational process, and which deform his/her relation with the academic teacher and the educational institution; and later to prepare the methodology and teaching methods for academic teachers and students themselves.

## 4. In search for the knowledge about human language

Some linguists in the contemporary cognitive mainstream research, while accepting the mentalistic character of linguistic phenomena, base their research on the cognitive grammar model of language, thus, remaining faithful to the traditional static view on human language being defined as a system of constituting elements. The informativeness and scientific faithfulness of the produced analyses would rise if cognitive grammarians formed local alliances with other sciences, psychology or neurobiology, for example. In order to investigate the nature, construction and peculiarity of, say, metaphorical language it

seems essential to extend the starting systemic analyses by the cultural and cognitive considerations which will encapsulate both the intrapersonal and the interpersonal contexts. As Maruszewski happily observes, 'semantic models (proposed today in cognitive linguistics — addition mine — M. B-T) cannot account for actions which are internally motivated and in which the doer has the choice based on the free will' (Maruszewski, 2005: 16-17; translation mine —M.B-T). Cognitive grammar continues the structural tradition in the language studies in a number of aspects, one of which is aptly noticed by Kiklewicz who says that in cognitive models the traditional, structuralist construct of langue is replaced by the cognitive construct of the linguistic representation of the world, being an idealized, abstract system of the conceptualization of the reality. The scientific methodology behind seems to be the same (Kiklewicz, 2006: 50).

Cognitive grammarians study semantic nets which, when activated, construct the link between human cognition and language; they look at language events and derive generalizations on the basis of databases of language samples; in the cognitive grammar model, language is defined as structured inventory of conventional linguistic units (Langacker in Dąbrowska and Kubiński, 2003: 41). It becomes quite clear that such linguistic approaches, while perceiving language as a system or net and focused on the best model construction to reflect the functions of such a system, fail to account for momentary in principle, often non-rational (because based on the individual cognitive system content, unconscious and emotionally marked as it is) processes of human cognition. All cognitive processes, together with the language process often fall beyond the cause and effect rationalizations. Moreover, when one has to deal with a process its dynamism and cross-contextuality cannot be grasped by models depicting semantic nets. One can join Maruszewski's line of argumentation that humans have their internal motivations, based on the right of choice and their subjective cognitive maps of the reality and their own selves, so they are not to be treated as robots, which is the case in linguistic proposals mentioned above (Maruszewski, 2005: 16-17). As Penrose notices, the workings of the human mind seem to contain some non-computable aspect, which is characterized by a certain randomness. So far, artificial intelligence models or any cognitive models do not reflect this peculiarity (Penrose, 1995).

In addition, Langacker himself notices that his usage-based model of language reflects the bottom-up perspective, in contrast with other

language models which propose the top-down perspective like Chomskian theory of language (Langacker in Dąbrowska and Kubiński, 2003: 30). In the meantime, cognitive linguists maintain that any functionally successful cognitive action, thought processes or the translation process, requires the complementary interaction of these two types of processing: the top-down and the bottom-up mechanisms. Moreover, the human mind realises its dynamism in the rhythm of the two reoccurring phases, the top-down phase, referring to the period of the epistemic openness, and the bottom-up phase, encompassing the period of the epistemic closure (Maruszewski and Ścigała, 1998; Bogusławska-Tafelska, 2006) (translation of the Polish terms is mine — M. B-T.). Hence, it is both perspectives that are to guarantee the completeness and optimality in any mental undertaking. In addition, Penrose (1995) postulates the existence of some third factor, beyond top-down and bottom-up processes, which is to constitute an inherent aspect of the mind.

The school of cognitive grammar, often referred to as cognitive linguistics, concentrates so intensely on the componential and static aspects of the language system that neglects the references to the underlying cognitive machinery and the extralinguistic context, with a multitude of mechanisms and corresponding cognitive-linguistic consequences. In this sense, quite literally, cognitive grammar seems an insubstantial reaction against traditional/structural linguistic paradigms (Kiklewicz, 2006: 50). Neostructuralism seems to lack the context of assisting sciences; so long as this paradigm closes itself against the cross-disciplinary parameter-rich models, its scholarly potential to immerse into the essence of the 'human being in the world' knowledge is to be reduced.

## 5. New physics to bridge the conceptual gap between synapses and thoughts

So far, several local meeting grounds have been presented which join or are to join the forces of interdisciplinarily-oriented scholars. At this point, thus, one will skip the local perspective and enter the macroperspective, to propose a verification of the scientific method. It has to be mentioned that such a unitary approach is not novel. The macroperspective unification model in science has occupied attention of several great minds of modern science. One can find such

methodological reflections directly formulated in Schrödinger's or Penrose's writings (Penrose, 1995; Schrödinger, 2007). These scholars are the advocates of the reshuffle in the present way of scholarly representing the reality, in order to allow a scientific insight into so far unresolved problems.

Before the ideas of Penrose are introduced here, is seems important to explain the postulate for the scientific method reshuffle. It is rather obvious that most scholars are reluctant to support the extreme thesis according to which the unresolved so far mysteries of the nature of things, human consciousness included, escape the scientific inquiry altogether and definitely (Penrose, 1995:12). Most scientists believe in the powers of the human intellect and the possibilities of modern technology. This be the case, there are scientific undertakings which have come to a halt and which seem hopelessly irresolvable. To make matters worse, even the first stages in the scientific method, that is, the identification of a problem and the thesis formulation, are often difficult to be reached. Many features of things and mechanisms simply escape one's notice, thus distort the picture being invisible themselves. Having rejected the possibility of the decay of science, one is left with the necessity to modify the method and change the ways in which one views problems and solves these problems. An interesting proposal comes from physicists and has the potential to become the indicated in this study metamodel for all natural sciences. This proposal points to the applicational potential of quantum physics and quantum models into cognitive science. As quantum models include such counter-intuitive however well-documented scientifically micro-scale phenomena as superposition, involving the idea of the molecule's location being a co-existence of alternatives rather than a definite, algorithmically monitorable location, another step in the traditionally exercised scientific method poses difficulty. Namely, one can find it problematic to make observations and collect the parameters of the observed objects or processes for further analysis. Quantum physicists usually describe the example of a photon which, while being in superposition, is doing two things at the same time and still retaining its integrity (Penrose, 1995: 260-263). In order to perceive and collect the parameters of objects which perform and not perform a certain action at the same time, or which are and are not in a certain location simultaneously, requires a considerable shift in the perception of the reality, and some reshuffle in the scientific method as such.

However, in spite of being so controversial and original, the proposals of quantum physics have to be taken seriously and considered by cognitive science. The introduction of the quantum theory into the linguistic research has made a number of so far unsolvable issues more approachable scientifically. First, the mind-body problem, identified by Leibniz as a conceptual gap between the mind-oriented studies and the brain —oriented studies in cognitive science, can now be reintroduced and, hopefully, dealt with; the same hopes are set for the binding problem in the neurolinguistic research (Gregory, 2004: 216). Second, the quantum theory has confirmed the intuitions of many cognitivists who were looking for the whole in its componential parts, and not just isolating and overestimating the details at the expense of the holistic view on the nature of language and the world around. In other words, what is suggested in the present paper, the postulated multiperspective cognitive approach to language, while being an integrated part of modern linguistics, does not lose the holistic view on man and his/her mind/brain as the generator and processor of language. The unquestionably important presupposition introduced together with the quantum models into the linguistic research is that the value of the sum is not necessarily the mathematical process of adding the values of its components. In other words, the system in its completeness cannot be analyzed by the analysis of its componential parts. This characteristic holism, in the quantum theory labeled as the nonseparability principle, when applied to the linguistic research, first, questions the traditional systemic approach focusing on the selected elements of the language system; second, confirms the findings and intuitions of many cognitive linguists who have abandoned traditional systemic analyses and have chosen the research across disciplines.

It may surprise some linguists that physics and mathematics have started to build local hybrid models with cognitive science and cognitive linguistics. What is even more astonishing, the local scientific advantages go together with the macroperspective scientific advantages, the result of which may be the modification of the scientific method, which has been proposed above. Today, the Oxford professor of physics Roger Penrose is the most prominent advocate of physics models in the mind/brain and consciousness research. The scholar points to serious loopholes in the present studies over consciousness and the human cognitive apparatus which can still be dealt with by science, though on the basis on yet-to-be discovered scientific framework. Penrose (1995)

says: '(..) the problem of conscious awareness is indeed a scientific one, even if the appropriate science may not yet be at hand'. Cognitive science has been perplexed at such complex tasks as the study of consciousness, which needs the cooperation of cognitive science and physics; after all, as Penrose argues, consciousness being a part of the universe, has to be incorporated into the physical theories of the universe (Penrose, 1995: 8). Furthermore, traditional physics will not suffice in the research, hence the models of quantum physics are to be implemented. In Penrose's proposals (1995) the ensuing assumptions can be found:

a. the nature of consciousness within the reach of scientific inquiry — Penrose supports the view that science will find the tools to deal with so far unsolved mysteries of the human consciousness.
b. the non-computability of the human mental potential — the scholar remains at the post that computably deterministic actions of digital computers will not mirror, analyze or explain consciousness; nor can one explain consciousness by means of the mathematical models of chaos. Penrose argues that the process of understanding cannot be an algorithmic activity. The physicist notices that, while most of actions that one can think of can be labeled as 'computational', what the science of consciousness is going to focus on is a certain 'pseudo-randomness' of mental phenomena (Penrose, 1995: 26, 27). There may be some 'cause' which steers cognition, a cause which is very subtle, non-computational, beyond chaos and beyond pure randomness. 'A cause could be something that cannot be computed in practice or in principle' (Penrose, 1995: 36). This cause could shed the light on such cognitive issues and concepts as, for example, the free will.
c. going beyond categorization — traditionally, science has been categorizing material, molecular objects into one group — it is the mass in Einstein's equation $E=mc^2$ - and non-material energy notions into the complementary category - Einstein's energy in the equation. In cognitive science the mind-body problem reflects this categorization. In contrast, Penrose points to this paradoxical yet experimentally documented Einstein's equation, then to the particle-wave duality proposed by the quantum physics, in order to propose a very simple intuition; namely, that going beyond the traditional categorization and accepting the dual nature of all substance, which may be described in terms of particles and waves simultaneously,

one obtains a paradigm allowing to study the human mind in context of the physical nature of the human brain (Penrose, 1995: 214). Moreover, through the application of the models of quantum physics another vexed issue of cognitive science would be at least approachable which is the Leibniz's gap, being the conceptual gap between the physiological nature of the nervous system and the cognitive nature of thought processes.

d. from the quantum physics to new physics — in the search for the unifying metamodel of the world substance Penrose starts his studies from the quantum models. The scholar foresees the further elaboration of these models to account for the non-computability of consciousness (Penrose, 1995: 216). The scholar leaves the level of neurons and neuronal circuits to go down to the intraneuronal cytoskeletal actions which should be regarded. Cytoskeletons are 'the nervous systems' of individual neurons; these cellular structures are composed of microtubules which, in turn, contain 13 columns of 'peanut shaped' globular protein pairs named tubulin dimers. Tubulin dimers can have two alternative geometrical configurations, the movement form one to the other configuration being dependent on their electric polarization, caused by the electron centrally placed and shifting its position. There is a hypothesis that tubulin dimers are the sought for basic units of the consciousness activity. However, what physicists are looking for is the model which would allow for the quantum phenomena to occur on a larger-of scale in the 'hot' brain tissue. So far, the peculiar parallelisms have been suggested between the switching time of tubulin dimers and collective quantum oscillations in macro scale quantum models (Penrose, 1995). Penrose concludes that

> '(..)we must look to some kind of coherence ona much larger scale that the level of single microtubules or even single cytoskeletons. There must be significant quantum entanglements between the states in the separate cytoskeletons of large numbers of different neurons, so that large areas of the brain would be involved in some kind of collective quantum state' (Penrose, 1995: 409).

The research of physicists interested in the essence of the mind and matter has been continued. The odds, however, are that the assumptions indicated in the present study will one day get synchronized and supplemented into one coherent theory with the optimal explanatory potential.

## 6. Concluding remarks

The advocated here hybridization within or across natural sciences, the language studies remaining in the focus of attention, does not accept reduction. In fact, the cognitive paradigm within linguistics does the opposite, namely, broadens the scholarly perspective by maximally contextualizing the language process. Cognitivism in contemporary linguistics realized in the very natural tendency for forming local relationships with the relevant theories cross-disciplinarily, offers brand-new thought pathways and makes it possible to finally formulate satisfying solutions to old scholarly problems. It seems more than probable that in the future the scientific method as such will undergo a metamorphosis, as it will no longer fit both the just-realised nature of things, and the just-proposed scientific tools to study the reality around. What seems to be the already achieved effect of this evolution towards a cross-disciplinary effort in science is the again 'natural', not forced by anything or anybody, devaluation of all overtheorized models and definitions that have been put forth, living their own lives and providing next generations of scholars with 'artificially flavored' food for thought. Concluding, cognitive linguistics has noticed the basic threefold relationship between man, language and the surrounding matter and non-matter; hence, cognitive linguists know today that any studies into the language process are, simultaneously, the studies into the genuine nature of the world around.

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# II.

## Cognitive analyses of the language system and the language process

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# Vectors of meaning: A contrastive study of *on* and *at*

## 1. Introduction

The main purpose of this paper is to account for the conceptual meanings of two English prepositions/particles – *on* and *at*. This shall be achieved by using a methodology proposed and developed by the author, which is deeply rooted in the theory of cognitive grammar and, to a limited extent, inspired by the idea of spacetime continuum borrowed from physics. The basic assumptions of this original proposal and the methodology employed to account for linguistic structures can only receive scant attention if we wish to expound on the main (linguistic) thesis proposed in this paper, which is the description and explanation of selected cases of *antonymous polysemy* of the two prepositions under discussion. As a result of this theoretical analysis, certain consequences for translation will also be mentioned.

## 2. Cone of English Prepositions (COEP)

Although the methodology used in this paper was inspired by physics, the analysis is a strictly linguistic one, i.e. all claims are supported by linguistic arguments and none of them can actually seek justification in the physical world. The relationship between physics and linguistics remains, therefore, purely metaphoric. The reason for using concepts borrowed from physics (or the philosophy of physics) resides in their economy and attractiveness: in an innovative way it is possible to en-

code a number of details in a relatively simple graphic representation of a conceptual meaning of a lexical item. Our methodology is thus one which seeks to give an integrated account of a number of parameters inscribed in just one picture, and these parameters include spatial and temporal domains, axiological value, and the internal structure of an event (yet only some of them shall be pursued in this paper). The basic graphical representation used to encode all these parameters is a template of Minkowski cones, which illustrates spacetime (rather than space and time as two independent concepts). Extending in the past and the future (which in physics is based on the conception of how a flash of light expounds), these cones are graphically represented in Figure 1:

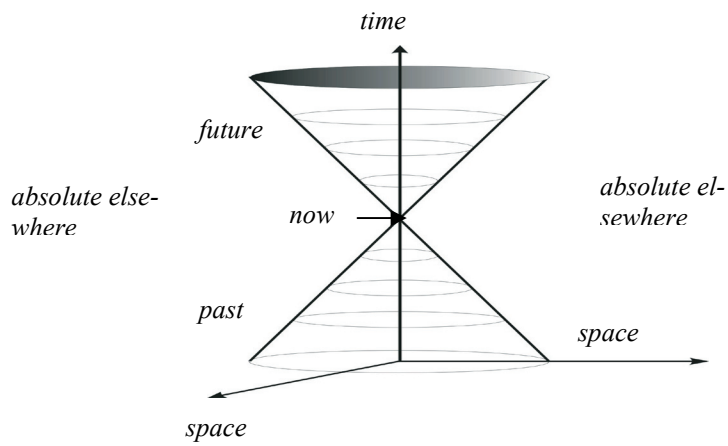
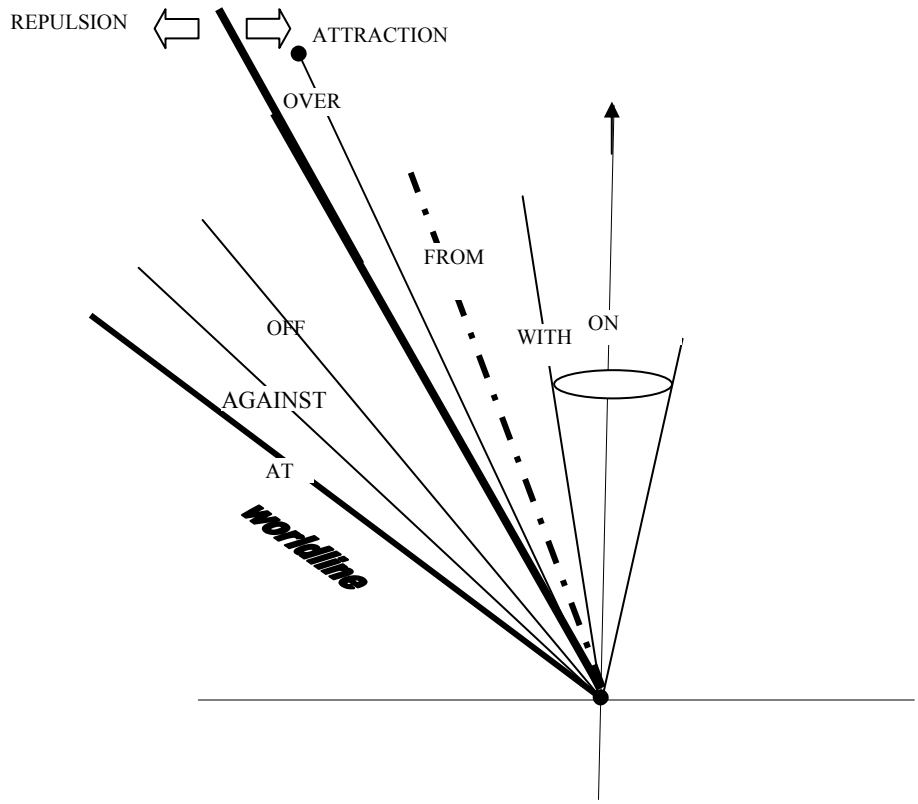



**Figure 1.** Minkowski cones

Drawing on the conical shape of the expansion of light presented above, and the movement of other entities in the world (which is always slower than light, hence it is always localized within the boundaries of the region marked by the cones of light), we can illustrate a number of movements that vary in velocity and are encoded by English prepositions.




| at | against | off | over | from | with | on |
|---|---|---|---|---|---|---|

**Figure 2.** Velocity encoded by prepositions.

As nothing can travel faster than light, cones of all prepositions should occupy the space between 'worldlines'. The preposition which designates the fastest movement (*at*) is thus closest to the borderline between the cone marked out by the speed of light, while the other extreme – a very slow movement and inertia encoded by *on* – is convergent with line *t*. Measuring from line *t*, the cones of different prepositions can be represented as vectors extending from *t* to the worldline (in our analysis the 'worldline' will be replaced by 'sceneline'). The length of the vector encodes the velocity of movement designated by each preposition: the longer the vector, the faster the movement. The preposi-

tions have thus been marshalled in the following order: *at, against, off, over, from, with, on.*

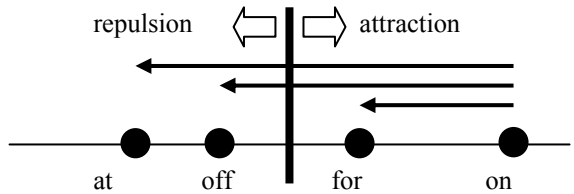



**Figure 3.** Prepositions of attraction and repulsion.

The prepositions localized between *on* and *at* – the two extreme points – have been divided into two groups which manifest opposite forces found in the world: repulsion and attraction.

It is not the intention of this paper to defend the justification of the order in which these prepositions are tabulated, or to prove that prepositions can be taxonomized according to the parameter of time and space at the same time (for details cf. Bączkowska, in preparation). Instead, what we shall focus on in the remainder of this paper is a discussion on the problem of an overlap which occurs in the conceptual meanings of prepositions localized as two extremes in the diagram of Cone of English Prepositions (COEP).

**Tools**

The COEP is employed in our analysis in two ways. First, it shows an arrangement of prepositions marshalled incrementally in the cone, and thus it codes a number of parameters stemming from its position in a cone, which are summarized in the table below:

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Cone of the future** | *t,x, y,z* | **Scope of predication** | **LEFT** | | | | | | | | | **RIGHT** | | |
| | | | **REPULSION** | | | | | **ATTRACTION** | | | | | | |
| | **TIME** | local/global perspective | ←gradual temporality reiteration time compression | | | | | gradual permanence → continuance time protraction | | | | | | |
| | **SPACE** | | proximity | | | | | precision | | | | | | |
| | | | space expansion | | | | | space contraction | | | | | | |
| | worldline = sceneline | | at | against | about | off | from | over | in | of | on | up | right | |
| **Cone of the past** | worldline = sceneline | | down | left | | | | | | | | | | |

**Table 1.** Temporal and spatial facets of prepositions.

The second way in which we shall use the concept of cones in our analysis requires that both the cones (of the past and the future) be considered and, using basic concepts developed by Langacker (1987) in his cognitive grammar, as well as those developed by the author herself (marked by an asterisk below), encode a number of complementary facets about the conceptual meaning of a given preposition by means of such tools as ellipses, profile vs. base, shaded vs. empty space in ellipses, profile vs. prioritization, cone region vs. absolute elsewhere region, varied radii of cones, varied degree and place of profilization of the cone, and global vs. local perspective. These terms shall now be briefly defined.

*cone region vs. absolute elsewhere – cone region is one which is accessible for our perception in a given context, whereas 'absolute elsewhere' is a region remaining outside the scope of our perception.
*radius – the radius of a cone of meaning; a longer radius is indicative of a preposition which encodes a fast movement (and/or a temporal state), while a short radius implies a slow movement (i.e. a more permanent state). The length of the radius imposes the angle at which the curvature of the light cones are inclining (which can be termed the fifth dimension).
base – the ground onto which the designatum of a semantic structure is mapped.
profile – a part of a base which is highlighted.
*prioritization – additional emphasis given to already profiled entity; double profile.

*global vs. local perspective/scope of predication – those aspects of a scene that are observable from either a distant or close-up position.
*ellipses – events occurring in spacetime; their shading designates the degree of involvement of the participant in the scene described/observed; for example, the difference between *involved in* (= being included, encompassed, or engaged due to external motivation) and *involved with* (= being engaged due to internal drive) can be illustrated as follows:

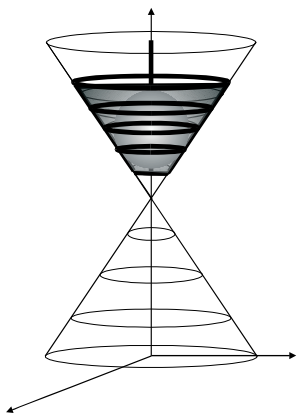


**Figure 4a.** Involved in

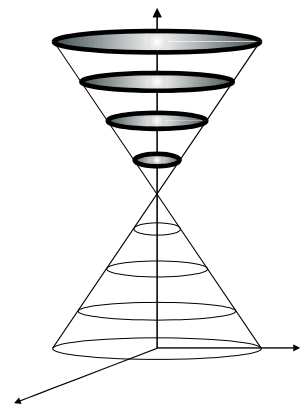


**Figure 4b.** Involved with

In Figure 4a the profiled area maps onto the whole region of the cone, and the ellipses are left un-profiled. Such a configuration suggests that the time and space which exist between events are equally important as the events themselves, and that the tr manifests a limited engagement in the action described (the fact that the tr is included in the region profiled in the cone may be accidental or against tr's will). In other words, the whole spacetime in which a tr is located constitutes a background for activities other than the one which is expressed by the noun following *involved in*. That the tr is fully involved in the action performed, and that this involvement is motivated by the tr's will can be marked by shaded ellipses in Figure 4b (the conceptual meaning encoded by *with* of being involved due to the tr's will was noticed by Dirven, 1995: 103-104).

## 3. Prepositions of attraction/repulsion: case studies of *on* and *at*

### 3.1. Verb + particle/preposition constructions

One of the fundamental claims inherent in my analyses based on COEP is that the preposition (regardless of whether it is used in the function of a preposition, i.e. in a nominal phrase or preposition phrase, a particle when patterned with a verb (sometimes called governed prepositions) or an adverb) preserves its conceptual meaning in all syntactic contexts, i.e. phrases, expressions, phrasal verbs, idioms, etc. Put another way, regardless of the degree of frozenness and opacity/transparency, the meaning encoded by the COEP remains unchanged. Taking this claim for granted in our analysis saves us from entering into a discussion about the structural differences between, say, a phrasal verb or a prepositional verb, which (to the best of my knowledge) has not been resolved completely and satisfactorily as yet. It seems that the traditionally accepted distinction between prepositions and particles or phrasal verbs and prepositional verbs, at a higher level of organization, loses much of its force in the approach presented in this paper, whereby both structures can be interpreted to designate an independent entity at the level of a phrase, yet ontologically they are believed to stem from one conceptual structure. Therefore in what follows, the above mentioned types of expressions shall receive our attention only briefly, i.e. to the extent necessary to justify following this school of reasoning.

The general problem of 'verb + particle + prepositions +/- nominal constructions' has been much discussed in literature, yet one unitary taxonomy has not been proposed. In this paper, rather than present an exhaustive survey, only a selection of definitions and classifications are presented in order to outline the scope of the problem.

Lindner (1983) groups combinations with prepositions/particles into two types: verb-prepositional phrase (VPP) and verb particles construction (VPC). Lexical words (observe that Lindner classifies prepositions and particles as lexical, i.e. meaningful items) such as *about*, *at*, *by*, *against*, *away*, *in*, *off*, *on*, *out*, *over*, *to*, *with*, etc., can function either as par-

ticles if they occur in VPC (called 'adverbs' in Sroka, (1965[1])), or as prepositions if they occur in VPP. Alternatively, they may occur in either class, and then they are termed 'adverb-preposition words' by Sroka or 'prepositional adverbs' by Bolinger (in Lindner, 1983: 2-3). According to Sroka, phrasal verbs encompass both VPC and VPP, which speaks for the inclusion of semantically transparent items into the category of phrasal verbs, traditionally conceived of as idiomatic. Thus, Sroka considerably extends the concept of phrasal verbs. Following other prominent linguists, Lindner mentions a number of criteria which should allow us to distinguish VPC from VPP; for example word stress. Lindner (1983: 10) cites papers which prove that in passive constructions a particle tends to be stressed while a preposition is unstressed. She hastens to add, however, that this claim is underestimated by other linguists, and therefore a new parameter that she proposes in her thesis is meaningfulness (1983: 25). The conclusion she arrives at, supported by a detailed analysis, is that particles "do code some part of the meaning of the VPC" (ibid.). This claim, with which we fully agree (cf. Bączkowska a) and on which we shall base our analysis in this paper, overrides the thesis of arbitrariness and idiomaticity of particles in verb + particle construction.

Collins Dictionary of Phrasal Verbs (CDPV, 2002) distinguishes several types of phrasal verbs which are defined as combinations of verbs with adverbial or prepositional particles. The authors, however, add that "different people have different definitions of 'phrasal verbs', and different ideas about which particles can be used to form phrasal verbs"; thus stressing the fact that phrasal verbs are structures not only difficult for learners to master, but also difficult for linguists to define and classify. For the purpose of this paper, let us mention only selected types proposed by CDPV (2002: vii):

[1] A thorough and interesting analysis of the status of the particle in phrasal verbs (whether it functions as an adverb or preposition) is expounded in Sroka (1972).

| Phrasal verb type | Example | Reason |
|---|---|---|
| 1. idiom | We really went to town. | *town* is part of the idiom |
| 2. non-literal | The town went up. | new meaning = explode |
| 3. fixed particle | The number refers to the day. | *refer* always occurs with *to* |
| 4. completive* | It's going along fine. | particle reinforces verb |
| 5. semi-literal | Thomas hit him back. | frequent occurrence |
| 6. literal | We went up the hill. | common verb and particle |
| 7. literal | Don't walk on the grass. | meaning is clear |

* Combinations where the particle does not change the meaning of the verb, but is used to suggest that the action described by the verb is performed thoroughly, completely, or continuously (2002: vi).

**Table 2.** Types of phrasal verbs.

CDPV considerably widens the coverage of combinations by including literal as well as non-literal meanings of phrasal verbs (combinations from 2 to 6 are included). In sum, CDPV assumes that a phrasal verb does not presuppose semantic opacity as, contrary to a vast majority of sources, literal and transparent phrasal verbs are also permitted. For example, Dirven (2001) claims that phrasal verbs do possess some degree of idiomaticity and he assembles phrasal verbs in the following groups:

1. verb + preposition: *cry over sth*;
2. verb + separable particle: *run up the flag*, *run the flag up*;
3. verb + inseparable particle: *run up a debt*;
4. verb + particle + preposition: *face up to problems*.

Cowie and Mackin (1998: xvii) list a number of types of phrasal verbs, of which the most important for this paper are the following three:

1. verb + particle: *take off*;
2. verb + prepositional phrase: *glance through the article*;
3. verb + particle + prepositional phrase: *put up with*.

In comparison to the taxonomy described above, the term 'phrasal verb' comprises a smaller number of constructions (disregarding literal, semi-literal and completive combinations).

Rudzka-Ostyn (2003) distinguishes three basic types of constructions which contain prepositions and/or particles. Phrasal verbs are idiomatic constructions which consist of a verb, an adverb (i.e. adverbial particle, to be more specific) and/or a preposition. Examples are *slow down*, *bring up*, *put off* and *face up to*, *come up with*, *get down to*, etc. (Rudzka-Ostyn,

2003: 1). Prepositional verbs, on the other hand, consist of a verb and a preposition. Examples are *refer to*, *look at*, *think of*, *abstain from*. Interestingly, Rudzka-Ostyn (2003: 2) claims that a prerequisite to understanding a phrasal verb is our understanding of the meaning of the verb, although this cannot always be a condition for the ultimate interpretation of the meaning of the whole phrasal verb. Whether the particle carries a transparent meaning or whether it is purely idiomatic is open to debate, according to Rudzka-Ostyn. The approach presented in this paper goes one step further by claiming that the conceptual meaning of a particle/preposition is preserved in any construction, and at a phrase level only limited modifications to the base are imposed by the mutual interaction of the preposition e-site or the verb and the preposition/particle, which is a profile determinant. In the phrases below, therefore, *under* and *up* profile the scene construed by the object designated by the noun or the motion designated by the verb, and their meaning as well as the meaning of the whole phrase is transparent:

(1) *under a table*
(2) *run up the hill*

In the last case, the whole phrase seems to be opaque, as the meanings of the constituents appear to bear no relation to the meaning of the phrase. However, we would like to defend the claim that the conceptual meanings encoded by the constituents *are* inherited at a higher order level. In other words, it is suggested that the phrase is not idiomatic but only abstract; in fact it is metaphoric: if *run up* means *accumulate* and *amass* it does not take much effort to envisage *expenses* to pile up and thus make a heap of entities laid on top of one another just as *sand* forms a *hill* by accumulating in one place. Rudzka-Ostyn's work cited in this paper successfully convinced us (similarly to Lindner) that the preposition/participle is not a semantically vacuous word but rather a meaningful entity closely connected with the concepts encoded by the words with which it collocates.

### 3.2. Canonical use of *at* and *on*

Before moving on to our analysis, a few words are in order regarding polysemy of prepositions/particles (PPs). A number of studies and theo-

retical solutions concerning PPs have been offered over the years within cognitive linguistics paradigm. One of them is of particular importance for our study. A principled polysemy model by Tyler and Evans (2003) relies on claims voiced by Langacker (1987) and Grady (1997): (1) Langacker asserts that "variation in ways of seeing a scene ultimately involves a variety of construals", and (2) Grady (1997) maintains that the notion of experiential correlation, i.e. a relation one stores in the memory existing between recurrently experienced human-environment interactions and non-primary (non-spatial in particular) meanings, allows explanations of the mechanisms responsible for meaning extensions inscribed in one conceptual/semantic network of meanings (Tyler and Evans 2003: 230). As an example of experiential correlation they invite us to envisage the similarity between "vertical elevation of a physical entity and an increase in the quantity of the entity", hence it is possible to say *Prices have gone up*, *The stock market is rising* or *The population size is on the way up* (Tyler and Evans 2003: 33).

Given these two fundamental theoretical claims, Tyler and Evans express their contention, which they verify in a meticulous study of PP, that meanings which seem to be distinct and arbitrary are in fact motivated. This motivation stems from two sources: cognitive (conceptual) analysis of (static) meaning as well as a dynamic meaning, i.e. one construed online (pragmatic). Prompted by a pragmatic situation, i.e. a linguistic context and functional features ascribed to TR and LM which they call "pragmatic strengthening", the dynamic meaning receives equal, if not primary, importance in their "pragmatic commitment" to meaning analysis. By so doing, Tyler and Evans move the point of gravity in a cognitive-oriented discussion on meaning towards pragmatics. This view pushes their thesis towards an approach known as *SPI* (*S*emantics-*P*ragmatics *I*nterface) advocated and discussed by e.g. Turner (1999), Lewandowska-Tomaszczyk (2004), Jaszczolt (2005). Furthermore, they also explain apparently distinct (antonymous) meanings by tracing their shared features (not only conceptual structures but also functional facets) in order to confirm (or reject) their common semantic/conceptual network affiliation. In other words, the authors maintain that meanings apparently antonymous can be derivatives of a common conceptual system marshaled in one conceptual-semantic network. They prove it by relying on contextual clues and, contrary to the analysis advocated in this paper, on functional facets. Our study resorts mainly to psychological accounts

of how time is sensed subjectively, nevertheless the thesis which Tyler and Evans posit proves helpful in our speculations on antonymous polysemy.

In the study presented below, antonymous polysemy illustrated by a dyad of two prepositions – *on* and *at* – is mirrored in the conical vectors of meaning proposed in this paper. It is of prior importance to first notice that they constitute the extreme points of cones: those with the vector (i.e. radius) maximally long and those with the vector ($v$) of zero value. This can be graphically presented as follows:

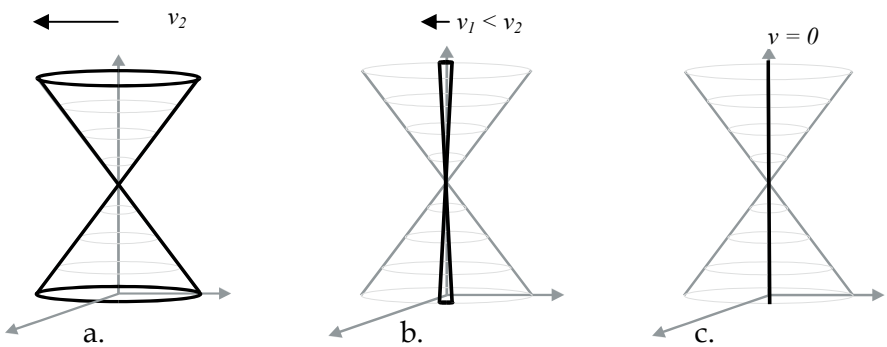



**Figure 5.** 3D representation of the preposition *at* (a.) and *on* (b., c.)

The different lengths of vectors in the above cones (i.e. different values of the fifth dimension) are determined by the assumption (borrowed from physics) that a fast movement marks out a cone with the longest possible radius, while a maximally slow movement is portrayed as a cone of minimal radius or as a line which is mapped onto the timeline. Put another way, $v_2$ denotes acceleration while $v_1$ and $v_2$ indicate deceleration.

Figure (5a) illustrates the preposition *at*, wherein the vector of meaning is the longest of the three and, by the same token, encodes a fast movement; while Figure (b) and (c) show either a cone of extremely short radius (5b) or vector of zero value (5c), and thus display either a very slow or lack of any movement, typically expressed by *on*.

What is interesting about the two extreme values is that they are localized at two extreme points on a cline (therefore representing complete

antonymy), yet they share a number of similarities in their conceptual meanings. In fact, their meanings often overlap or even become reverse. As a consequence, the meaning of one preposition embodies the properties of its opposite. We shall examine some examples in the remainder of this paper to illustrate the case of antonymous polysemy.

### 3.3. Scopes of predication

For the purpose of our analysis, I would like to distinguish between two types of perspectivization: global and local. The variables which parametricize a scene observed – time and space – manifest contrary properties in these perspectives. In the local perspective (i.e. one seen from a short distance or experienced by a participant of the actions on stage), time, which is identified with timeline *t* (i.e. manifesting inertia, encoded by e.g. *on*), seems to be protracting (as in *time drags*); while from the global perspective the same interval of time is conceived of as being contracted (as in *curb on drags*). On the conceptual level, this changing in optics is motivated by the correspondence between an object and the time of its processing (mental scanning): it is short in the case of a great distance, in comparison to objects located in the immediate vicinity of the observer wherein sequential scanning requires a fine-grained analysis of details, which is more time-consuming than a coarse-grained examination typical of objects located at greater distances.
In line with the cone of English prepositions presented in section 1, the preposition *on* is used of permanence and continuance (and to indicate spatial extension: space extends in all directions or two directions, as in *on the floor* versus *on the beach*), while *at* is implicative of temporality and reiteration (and points in space). This claim can be illustrated by the following examples:

> ***on***: *on standby, on guard, on (the) alert, on call, on demand, (be) on e-mail, on loan, on a dole, on scholarship, on a mission, on patrol, on duty, on a hunt, linger on, on a ramble, ramble on, dwell on, plough on, run on batteries, insist on, sit on (a book, a task), on sale, on the run from, be intent on, brood on, focus on, concentrate on, elaborate on, engage on (cancer research/writing a novel, etc.), spy on, attend on, be on the ball, sleep on sth, keen on, sponge on sb, drone on, harp on, rattle on, play on, struggle on, hang on, tick on, run on, gabble on, grind on, plod on, live on, feed on, draw on, drag on, fix on, crack on, be hooked on, brood on, dream on, get on well with sb, have sb on (=tease), pick on, egg sb on, be on sb's mind, (live) on the breadline, be getting on, gas on, reflect on, sleep on, buckle on, dab on, chafe on, rabbit on, sell on, roll on, bash on, pick on sb, fasten on, prey on; lavish on, press on, train on, go on, carry on, rumble on, soldier on, on the beach, on the bottom, look on, expert on, on form, on*

*display, on probation, research on, to be keen on, to be bent on* (=determined to do something), *dote on sb, operate on.* (94 examples)

***at**: at once, at one go, call at, pluck at, strike at, prod at, tug at, tear at, get at, poke at, paw at, nibble at, balk at, buck at, jib at, grab at, fly at, at a stroke, at a speed, jump at, at one single blow, glimpse at, taken aback at, shocked at, stagger at, grab at, have at it, catch at, jab at, nibble at, dab at, at (regular) intervals, at times, pick at, peck at, sip at, nibble at, paw at, pluck at, tug at*. (40 examples)

The above phrases are illustrative of the local perspective, i.e. one which emphasizes propinquity between the scene observed (SO) and the observer. In fact, the observer (i.e. the conceptualizer) is often a participant of the scene himself. Slow processing of information is closely connected with being close to the object observed: it takes more time to examine a painting which occupies the whole wall in a room (e.g. Jackson Pollock's *One*) than a picture of a standard size. Moreover, it is also more time-consuming to analyze an object being very close to it (e.g. a train car), as this typically involves careful sequential scanning or even going round the object in order to observe all its details, than when a train passes by at a distance of one kilometer (an object becomes smaller with increasing distance between the object and its observer, and thus the time required to scan the object is considerably shorter). Therefore, being close to SO (virtually and/or physically) can entail (subjective) time protraction if the action described carries some negative meaning; for example, listening to a boring lecture or waiting for something very important like an examination or medical results (e.g. *wait on* as in *I'm waiting on my boss to retire* (PWN/Oxford Dictionary), or *to be on tenterhooks*).
Contrary to the above examples, from the global perspective the meanings are reverse – *on* expresses short and/or terminal actions/states (physically or spiritually), whereas *at* designates time extension or postponement of actions (thus implying potentiality rather than factuality). The following expressions support this claim:

***on*:** *choke on sth* (*a morsel of food*), *hit on sth* (*the table*), *bring on* (= start an illness), *curb on, to be on steroids/antibiotics*, *pass on* (= *die*), *on the ball* (= alert or able to think quickly), *on your last legs* (= ill and likely to die, very tired, LDOCE), (*live*) *on the breadline*, *slip on* (a piece of clothing), *beat on, spring on, pounce on, fall on* (= eagerly seize sth), *jump on, round on, turn on* (= suddenly speak angrily), *set on* (= make a sudden and unexpected attack)*; dawn on, split on, stagger on, tell on, weigh on, rat on*, *be thought on sb*, etc. (24 examples).

***at**: at a later date*, *at another time, at rest*, *at sb's disposal*, *at sb's command*, *at rest* (=not moving, still; dead), *stick at (continue to do sth), gnaw at,* etc. (8 examples).

The two proposed perspectives and the concepts they encode are summarily shown in Table 3:

| **Region in cones/ preposition** | **Local perspective** | **Global perspective** |
|---|---|---|
| $v_0$ – timeline/ *on* | time protraction | time compression (termination) |
| $v_2$ – sceneline/ *at* | time compression | time protraction (postponement) |

**Table 3.** Time protraction and time compression encoded by *on* and *at*.

The vast number of items, which exemplify the local perspective in the case of both prepositions, significantly overrides the total number of items assigned to the set of global perspective. It seems legitimate to claim, therefore, that the canonical meaning coded by *on* is 'continuance and permanence' (local perspective), while 'temporality and reiteration' (global perspective) are typical of *at*, and not the reverse.

## 4. Case study: antonymous polysemy

In accordance with most dictionaries, the word *nibble* is followed by the preposition *at*, although the preposition *on* is also permitted. This claim can be easily defended by analyzing the contexts in which the verbs typically occur (e-site and the tr in particular). Let us discuss the following examples:

(3) There's a fish **nibbling at** my bait (LDCE)
(4) He **nibbled on** a piece of raw meat (LDCE)

The difference between the e-sites in the above sentences, illustrated by *a piece of meat* and *bait* (prepared for a fish), is such that *bait* is floating inertly in water, which makes it more difficult for a potential fish to catch than in the case of meat which is most probably held by the tr in his hands and thus is readily available. Obstacles in reaching the lm impose iterative actions aimed at capturing the target object, and this observation, embodied by *nibble at*, is compatible with the conceptual meaning of *at*. On the other hand, prolonged availability of the lm to the tr is implicative of a continuous action, only sporadically broken by the necessity to chew the meat. Unlike *nibble at*, the verb *nibble* (= to take small repeated bites), however, does not allow long pauses occupied by chewing, as small morsels are eaten fast. In *nibble on*, therefore, we can ob-

serve conflicting scenes emerging from the verb (implying a fast movement) and the preposition (implying a slow movement), which, in the final analysis, sum up to the concept of continuity overriding discreteness. It is thus the preposition which is ascribed the function of profile determinant in a given phrase. The two expressions can be illustrated as follows:


**Figure 6.** Conceptualizations of *nibble on* and *nibble at*.

In a four-dimensional spacetime the above illustrations can be represented as follows:

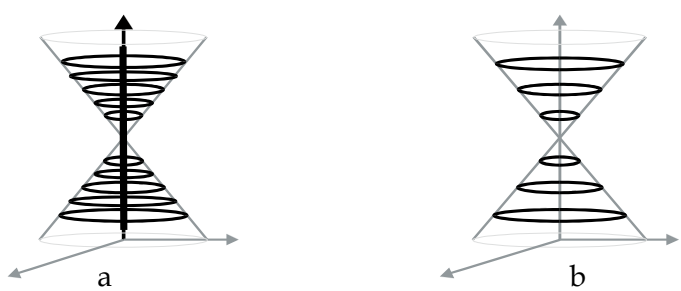



**Figure 7.** 3D conceptualizations of *nibble on* (a.) and *nibble at* (b.).

In Figure (7a.) and (7b.) the tr is moderately involved in the action performed (hence the lack of shaded ellipses), yet the frequency of events is much higher in the case of *nibble on*. In fact, the frequency is potentially high enough to allow the perception of this series of events as forming a continuous line, rather than a collection of clear-cut points on the timeline. As a result, in (a.) the timeline receives a double profile, i.e. it is prioritized. Observe that the continuity line is not only congruent with the time of events marked in the diagram, but it also extends into the past and the future. By doing so, the concept of continuity (extending into infinity) is, again, emphasized. However, the action portrayed by *nibble at* also displays high frequency of occurrence. In fact, it may be of equal recurrence relative to the action encoded by *nibble on*. The actions may thus invoke similar scenes, yet the processes by which they were construed are not alike. The difference between the two scenes resides in

the speed of these actions: it is protracted in the case of *on* but compressed when expressed by *at*. Put another way, the density of information processing is believed to be higher per standard temporal unit when one is attentive and conscious of the experienced event (due to the event being extremely boring or extremely pleasurable), and it is believed to be lower when one performs actions in a superficial and/or automatic manner (due to decreased subjective involvement)[2]. Seen in this way, these contexts are organized in line with the local perspective: time protraction is indexed by *on*, while time compression is designated by *at*.


a. *on* b. *at*

**Figure 8.** Reiteration encoded by *on* and *at*

The above analysis has a consequence for translation. As corpus data further reveal, *nibble at* is usually rendered into *kąsać*, *podgryzać*, or *skubać*, thus preserving the shadow of negativity and the idea of performing an action unconsciously while doing other things that require attention. Although there are more neutral or even positive contexts associated with *nibble at*, negativity is also discernible and it is frequent. It is indicated by the use of negative sentences and the use of such words as *nervous* (*nibble at sb's lip*). *Nibble on*, in turn, is suggestive of more neutral or even positive feelings and a fully conscious action. In consequence, its equivalent in Polish is likely to be different, e.g. *zjeść, przekąsić*. The positive attributes related with *nibble on* can be seen in the neighbouring elements, and these are *enjoy*, *eating well*, and the like, especially used while talking about a healthy diet.

Unlike in the above contexts, the global perspective is reflected in *attempt on* and *attempt at*: the indication of short and terminal action by *on*, and long or prolonged action encoded by *at*. Examples (4-5) illustrate intentional action, which requires deep involvement and careful proc-

[2] See Flatherty (1999) for more examples of time protraction and time compression experienced in every day life, and Evans (2004) for examples of the phenomenon manifested in metaphoric language.

essing, and in addition it entails extreme violence and eventually termination. To convey such implications, *attempt* is followed by *on*. Sentences (5-6), on the other hand, indicate an action which, although intentional, does not require such high attention and intense processing. Observe, however, that attention is probably much higher in (5) than in (6). It seems that while attempts at reaching a compromise requires high and equal involvement on the part of both persons concerned, attempts at contacting another person seems to be less engaging (and involves only the caller, for instance), or perhaps even routine. Here the differences in translation of the two phrases are obvious: *attempt on* is rendered into *podjąć próbę zamachu*, while the typical equivalent of *attempt at* is *podjąć próbę zrobienia czegoś*.

(5) Somebody has made an **attempt on** the President's life (OALD)
(6) This is the third **attempt on** the President's life this year (CALD)
(7) The couple made several unsuccessful **attempts at** a compromise (OALD)
(8) None of our **attempts at** contacting Dr James was successful (CALD)

The combination *attempt on*, in line with LP (which is the prototypical one) should encode a long and permanent state, yet in the above examples it portrays a scene whereby the state of the tr is short and terminal. It is perhaps worth mentioning in passing that the span of time is not equal in these sentences: in sentence (5) the event is single, while in (6) (as well as in (7-8)), it includes several events which are mentally merged into one *attempt*. In other words, they differ in spatiotemporal locality (cf. Bączkowska b). *On* is thus indicative of a short action in GP, and by encoding a single and short action, *on* violates its prototypical conceptual meaning of permanence and maps onto the conceptual meaning of *at*.

As in previously analyzed cases, either *on* or *at* are permitted when followed by the verb *sip*: typically *sip* goes with *at*, yet the combination *sip on* cannot be excluded (cf. LPVD: 278). The concepts triggered by each preposition are characteristic of local perspectives and they remain unchanged in these phrases: temporality, reiteration and briefness (here identified with pleasure, as we know *Time flies when we are having fun*) in

the case of *at*, and permanence, durability and time protraction (here identified with boredom) in the case of *on*.

(8) He **sipped at** his wine with pleasure (LDOCE)
(9) She sat there **sipping at** her tea (OALD)
(10) Haney **sipped on** his tea and looked bored (LPVD)

Viewed in this way, it is legitimate to expect that a lack of any preposition after *sip* is implicative of expressing an unprofiled configuration, wherein the temporal aspect related to the conceptual meaning of coded by *sip* is left inexplicit. Interestingly, the problem of 'dual construction with differing senses' was touched upon about eighty years ago by Bøgholm (1920; cited after Sroka, 1972: 128). Bøgholm is of the opinion that constructions which consist of the verb and a preposition tend to express duration, as opposed to constructions which lack the preposition. For example, *to jaw at one*, or *suffer from terrible pains* encode longer spans of time than *to jaw one*, or *suffer terrible pains*. Sroka (1972: 119-120), however, expresses his doubt as to the appropriateness of this line of reasoning by saying that it is unverifiable, "subjective and lacks proof".

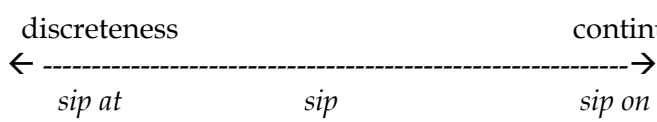



**Figure 9.** Discreteness and continuity encoded by *sip at*, *sip*, and *sip on*.

Interestingly, when followed by *at*, not only is *sip* indicative of an action which consists of a number of short actions, but also of an event which requires minimal attention and involvement (it occupies only a small segment on the timeline *t*). Contrary to *at*, when followed by *on*, we tend to interpret it as temporal protraction, which assumes a more conscious (i.e. fine-grained) experience (hence an event disc occupies a long segment on the timeline). Stretching the event disc of *on* allows one to notice the structure (texture) of an event, as we (mentally) get closer to the scene observed. It is also important to notice the fact that time protraction entails space contraction, which is a strong argument for greater concentration and higher complexity of processing (i.e. more detailed analysis) on the current 'here-and-now' event associated with *on*, which,

by the same token, disallows the performance of two actions that require high concentration simultaneously. On the other hand, an '*at*' ellipse occupies a sufficient area of space to allow another ellipse (action) to be inscribed in it, i.e. to perform two actions simultaneously (one of them being performed more superficially, thus typically having the function of creating the background for another action (cf. Figure 15)). Incremental fine-grained processing is illustrated by cones as a gradually changing shape of ellipses (which denote 'events'): they are flattened in the case of *at*, and lengthened in the case of *on*.

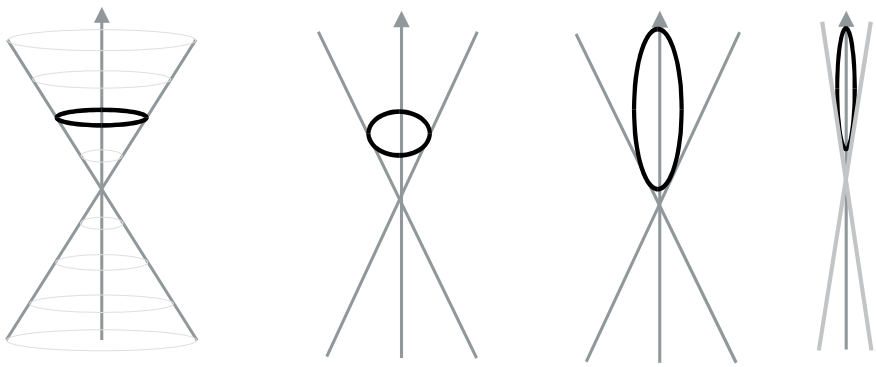


**Figure 10.** 3 D representation of time protraction.

The phrase *on the spot* denotes a number of meanings, of which three are suggestive of antonymous polysemy (HarperCollins 1995): (i) immediately; (ii) at the place in question; and (iii) without moving from the place of one's location. The first meaning overlaps with the meaning of *at* indicating a sudden and abrupt movement, whereas the other meanings encode lack of movement and therefore they converge with the meaning of *on*. We shall now delineate several instances which further exemplify antonymous polysemy of *at* and *on*. As was argued in the previous section, *on* can convey two opposite meanings which are encoded by *focus on* and *skimp on*: the former is implicative of a long span of time required for a tr to look into a problem thoroughly, while the latter highlights a superficial activity which results in a failure. Contradictory meanings are also conveyed by *crack on*, which, defined as 'continue doing something quickly and energetically' (HarperCollins 2002), converges with the typical meaning of *on* – continuance – as well as *at* – quick movement. Similarly, *pick on* which according to HarperCollins

dictionary means 'almost the same as *get at*' (i.e. attack), supports the claim that the conceptual meanings of *on* and *at* often overlap. The last examples – *work on* and *work at* – manifest actions whose frequencies are so high that they tend to be conceived of as construing a continuous action (a line, cf. Figure 8), rather than an atomized collection of independent events (similar analysis is applicable to *bang on*: 1. talk for a long time; 2. perform this activity repeatedly). As in the case of *nibble on* versus *nibble at* discussed above, *work on* also profiles the aspect of the length of time devoted to the action observed, whereas *work at* triggers off a scene of an attempt at achieving the intended goal, thus implying either distance between the present state and the target or difficulty in achieving the target. Negative charge can also be traced in *beat on* (= hit or kick many times so that you are badly hurt), wherein 'many times' can be associated with reiteration, and 'being hurt' triggers association with a terminal state. Likewise, *on the breadline* designates termination characteristic of *on*, seen from the global perspective, and at the same time, continuance ascribed to the meaning of *on* in the local optics (i.e. a subjective feeling of time extension).

Comparing *on duty* with *at sb's disposal* we can notice that both phrases signal being on alert, waiting for something to happen, and being ready to participate in the awaited event. It is thus the potentiality that is profiled rather than the actuality. As potentiality refers to the future, it is the cone of the future that is important in construing a scene induced by the two phrases. If both phrases denote, roughly speaking, the same meaning of being available, the question which naturally arises is whether there is any minute shift in meaning at the conceptual level due to the choice of different prepositions. I would like to express my belief that the difference resides in modality[3]. Namely, events which occur within the region of the timeline (i.e. are located at its vicinity or overlap the timeline) manifest a very high probability that a potential event is likely

[3] The use of cones to illustrate modality, although in a slightly different manner, was proposed about a decade ago by Inchaurralde (1996) to provide an explication of the meaning encoded by selected modal verbs. Although Inchaurralde's intriguing and important paper was written before I was aware of the fact that concepts stemming from physics elaborated in this article and other articles based on my proposal (cf. Bączkowska, in preparation) were within the scope of interest of another scholar, his paper was a great inspiration for the description of the conceptual meaning of prepositions in terms of *modality*, presented in the remainder of this section, which allowed me to look into the nature of prepositions/particles from yet another perspective.

to take place in objective reality. In fact, it is often used to indicate immediacy and/or emergency. Those located on the borderline (i.e. worldline) or within its close vicinity, on the other hand, stress the theoretical potentiality and lower probability of its realization, as well as a lack of (or covert) immediacy and emergency. 'Absolute elsewhere', on the other hand, hosts events which are either unavailable or impossible.

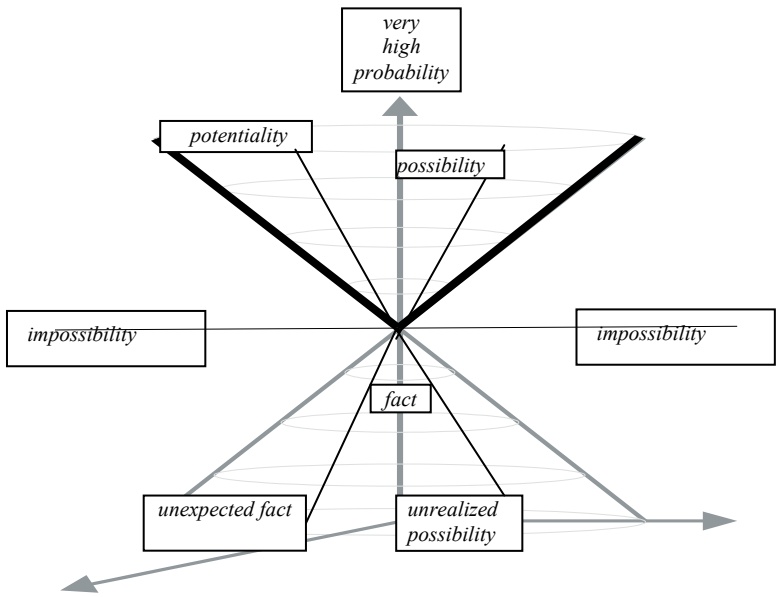



**Figure 11.** Modality inscribed in Minkowski cones.

The region of the cones can be further divided into smaller parts, as shown in Table 4:

| **Infinity** | **Region inside the cone** | | | **Timeline ($R_0$)** |
|---|---|---|---|---|
| | **Partition $R_3$** | **Partition $R_2$** | **Partition $R_1$** | |
| **Cone of the future** | *impossibility* | *potentiality* | *possibility* | *very high probability* |
| **Cone of the past** | *unavailability* | *unrealized potentiality* | *unrealized possibility* | *fact* |

**Table 4.** Incremental nature of modality.

The potential and actual structure of an event is as follows:

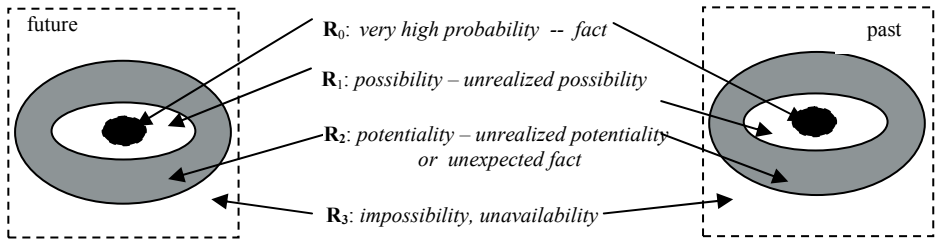



**Figure 12.** Modality inscribed in an event.

The preposition *on* illustrates facts and events of high probability, as in *The book is on the table*, for example; the probability of this configuration lasting in the future is very high because it portrays a static arrangement. Although the present tense is used to express this tr/lm configuration, it is obvious that *the book* was on the table a minute ago and the probability is high that it will be there in five minutes. There are, however, cases which encode a variation of this configuration:

Variation of *on*: *on the brink of war, on the verge of extinction/nervous breakdown, on the tip on one's tongue*, *on the threshold*, etc.

In the case above the (border)line, which is typically mapped onto the timeline *t* to express the meaning of *on*, overlaps with the worldline (Figure 15a). Portrayed in this way, the current improbability of the expected event is stressed (hence marked in the region of 'absolute elsewhere', which is superimposed on the cone of the future), yet it is believed to occur in the immediate future with such a high contention that regions $R_3$ and $R_0$ are merged.

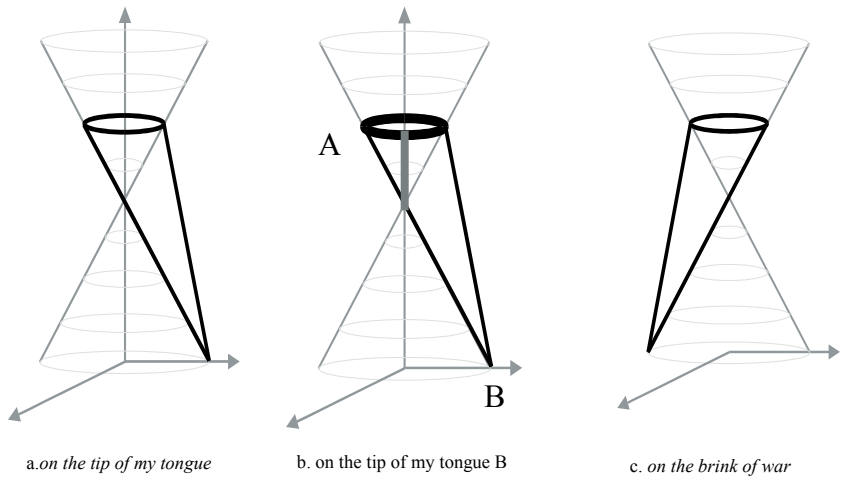



**Figure 13.** Graphic representation of *on the tip of my tongue* and *on the brink of war*.

Central to this configuration is not space but time, yet the temporal facet is given prominence to degrees which can considerably vary, depending on which point in time we actually refer to (Figure 13b). For example, the time 'now' implied by any of the above phrases, i.e. the moment of, say, retrieval of a word, is superimposed on the future timeline, despite the fact that the future cone typically hosts facts rather than possible or probable events (hence this section of the timeline is profiled in grey, as it still remains a non-fact). The crucial point in this scene, however, is the actual utterance of the retrieved word, hence double profiling of the ellipse (designating an event). A part of the region 'absolute elsewhere' is also profiled to stress the fact that what was unavailable (or unimportant) in the past is achievable and feasible in the immediate future. The borderline (note that the concept of 'line' is canonically encoded by on, cf. *on the horizon*, *on a platform*, *on the coastline*), expressed by the word *tip* in the phrase *on the tip of one's tongue*, is designated by the line which overlaps with the cone worldline (section {A, B}). The profiled 'absolute elsewhere' region occupies the right side of the diagram, as in line with the assertions of cognitive linguistics (e.g. Lakoff, 1980) the notion of the left triggers associations of negative axiological charge (e.g. left-handed = clumsy), while the right invokes positive concepts. Therefore, Figure 13c is assigned with negative events expressed by *on the brink of war* or *on the verge of extinction* and the like.

Returning to the contrastive analysis of the phrases *on duty* and *at sb's disposal* , given the parameter of modality, it can be argued that the meaning conveyed by *on call* and *at disposal* is as follows: *on call* is implicative of the necessity to participate in the anticipated event(s), whereas the use of the preposition *at* with *disposal* licenses us to think that our availability is more hypothetical than actual, and that (most likely) we shall not need to participate in a potential event with high frequency and on a regular basis (a similar meaning is conveyed by *being at sb's command*). Examples of the above claim are the following:

(9)
a. I'll be **on call** the night of the party (= available for work if necessary especially in an emergency: *a policeman, doctor, officer,* etc.) (OALD)
b. Don't worry, there is a doctor **on call** 24 hours a day
c. (LDCE)

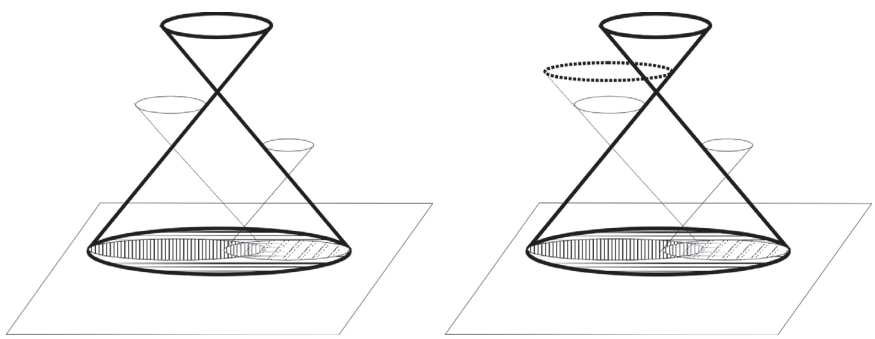
(10)
a. Well, I am at your disposal (= I am ready to help you in any way I can) (OALD[4])
b. Tanner had a lot of cash **at his disposal** (LDCE)
c. Each congressman has a large staff **at his command** (= available to be used) (LDCE)

Presented in (9) are contexts which encode high probability: a doctor on call is very likely to provide medical aid in emergencies occurring a number of times within 24 hours. Unlike in *on call*, in (10) the implicitly indicated time span far exceeds 24 hours. In fact, being at somebody's disposal typically refers to the whole job tenure or to unlimited time span (10b) and is implicative of less frequent occurrences of such events in which one has to participate; although it cannot be precluded that the

[4] *At sb's disposal* can have a slightly different meaning (*available for use as you prefer/sb prefers* (OALD)), which is illustrated by the following sentence: "He will have a car at his disposal for the whole month". In this context, *at sb's disposal* does not indicate so much potentiality as actuality in the future (i.e. high probability), which is typical of *on*. The meanings of *at* and *on* would thus converge in such contexts.

event referred to (e.g. helping somebody in 10a or spending money in 10b) might never take place. In other words, the event is only hypothetical (i.e. potential). Thus, potentiality manifested by the phrase *at your disposal* converges with the conceptual meaning of *at* per se, which occupies the region of potentiality ($R_2$).

In Figure 14a the potential events are located beyond the worldline of the cone for P which limits the region of 'points of contact' to a common (world)line. Configurated in this way, the events illustrated by the cones for R place the emphasis on their improbability or small probability of occurrence in the P cone, although potentially and hypothetically the cones of P and R can intersect in the future (and at some point in the past) (Figure 14b).



a. potential events b. potential and actual events

**Figure 14.** Potential and actual events encoded by *at one's disposal*

Thus, the phrase *at sb's disposal* can be portrayed as the events which at the moment are marginalized, yet not excluded from the world of the tr (cone P). They remain 'on standby' and can be 'activated' at any time. Considering *on duty*, the 'standby' resembles 'alert', with the potential events located inside the P cone, which leads to emphasis being placed on the immediacy and high probability of R events, as well as the implication of a (subjectively perceived as) prolonged state, but at the same time, a state which, globally perceived, occupies an interval of much shorter length than one in the case of *at*.

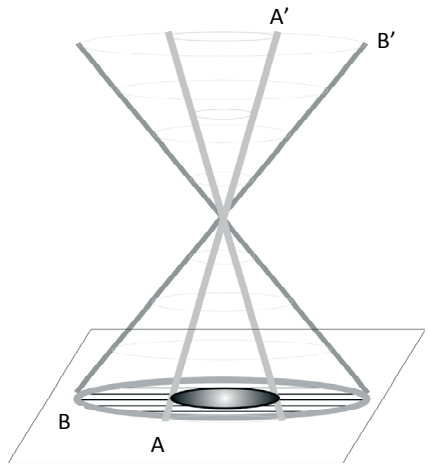



**Figure 15.** 3D conceptualization of *on duty*

Traveling along the sceneline of the *at* cone from an event occurring in the past on simultaneous space (B, B') takes more time than in the case of *on* (A, A'), as the interval determined by the sceneline of the *on* cone is shorter.

Let us now move on with our contrastive analysis of *at* vs. *on* by presenting yet another set of examples. Similar to sentences (9) and (10), the expression *chafe on* and *chafe at* encode not only the conceptual meanings of the prepositions but also different aspects of modality. Compare the following definitions:

*chafe on:* to cause friction; rub (CED)
*chafe* (or champ) *at* (*the bit*): to be impatient to start work, a journey, etc. (CED); to feel impatient or annoyed (LDCE); to feel annoyed and impatient about sth, especially because it limits what you can do (OALD)

The first definition invokes a scene in which the action described is occurring in reality (it is thus located in $\mathbf{R}_1$) and is continuing (the contact between the rubbing hands is not broken), while the second definition designates a potential possibility ($\mathbf{R}_3$) that the action can be realized in the near future.

To summarize what has been said so far, a list of conclusions can be presented:

1. *at* implies events of lower probability than *on* (local perspective);
2. *at* implies events which last (i.e. they are subjectively perceived as) a shorter span of time than *on*;
3. *at* implies low density of processing information, i.e. superficiality and/or limited involvement in performing the action described, which often entails automaticity and routine;
4. *at* implies a series of events spanning a longer interval than *on* (greater spatiotemporal locality, i.e. it applies to global perspective);
5. *at* implies a longer expectation time for an event in the future than *on* (global perspective).

In conclusion, bearing in mind what has been examined in the foregoing discussion, it is important to notice that two types of antonymous polysemy have been illustrated: conceptual and lexical. While the former involves two conceptual meanings invoked by one word, lexical antonymous polysemy occurs when one (or similar) conceptual meaning is triggered by two words whose prototypical meanings manifest conflicting ideas.

Conceptual antonymous polysemy: *ON* – 1. slow movement (e.g. *linger on*); 2. fast movement (e.g. *hit on*);
Lexical antonymous polysemy: 1. *nibble on* and 2. *nibble at* – CONTINUITY.

## 5. Conclusion

In trying to define the conceptual meanings of the two prepositions/particles in question – *at* and *on* – an interesting phenomenon has unfolded: the prepositions display contradictory properties. To be more precise, whilst *on* encodes protracted actions/states, *at* signals compressed and short actions. This view (dubbed the local perspective), however, uncovers only one side of the story. In line with the competing view – the global perspective – *on* is associated with properties typical of *at*, and *at* is congruent with the meaning of *on*. What we can observe, therefore, is a borderline case of antonymous polysemy (conceptual or

lexical). The borderline at which two extrema converge (i.e. two antonymous meanings), seems to lose its resolution: it functions as a zero point from which two opposite values are derived, yet the borderline itself, although indexing a critical moment in spacetime, is semantically bleached, as a result of which both sets of properties (belonging to either *at* or *on*) are ascribed to both prepositions under discussion. In terms of such an understanding, the critical line becomes a region that can be characterized by graded shifts in values, aspiring thus to the notion of continuity rather than discreteness.

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**Anna Drogosz**

# Ontological Metaphors In Darwin's *The Origin Of Species*

## 1. Introduction

One of the most fundamental assumptions of Cognitive Linguistics is that we employ conceptual metaphors, that is that we talk about things and ideas we do not know and understand well in terms of things and experiences that we are familiar with, which are related to our bodies and to our most basic, physical experience. It is particularly well visible in the language of science, whenever it leaves the description of observable facts and engages in the interpretation of these facts, that is, when a theory is created.

When in the 19th century Charles Darwin undertook his attempt to give a coherent interpretation of the facts of life and death in the natural world, later known as the theory of evolution, he found himself in a position in which he had to resort to metaphors and analogies to express in the English language his generalizations and observations. Many of the metaphors (such as the struggle for life, natural selection and the survival of the fittest) were implemented consciously by their author, and have always been recognized to be metaphors in the traditional, literary sense, however, at a closer inspection it becomes apparent that the whole theory is a coherent system of blends, conceptual metaphors and their entailments.

Before we begin an analysis of Darwin's text, a number of preliminary remarks have to be made. Firstly, this study is intended for linguists and not for biologists. That is why, sometimes explanations concerning Darwin's work or theory are provided even though they

may seem rudimentary in the eye of a biologist. Secondly, this is a linguistic study of a text and not an interpretation of a biological theory. The study aims at an analysis of the language used by Darwin but it is not concerned whether the way Darwin described the processes in the natural world is accurate or not. Finally, the fact that the core of Darwin's theory is based on metaphors, which we are going to reveal, does not invalidate the theory itself. In biology, as in any other science, scientists have to resort to metaphors when describing phenomena transcending the immediate physical experience. Any time a scholar goes beyond a simple recognition of easily observable facts and creates a generalization or a theory, he has to employ metaphors but it does not mean that his generalization or theory has no heuristic value.

Cognitive Linguistics provides perfect tools for a study of metaphors in Darwin's work because of its broad view on conceptual metaphor and blending. It will allow, we hope, to describe not only such obvious metaphors as the struggle for life, but to uncover basic, conventional metaphors and image schemas that constitute the backbone of the theory. Such basic metaphors and image schemas must have been a first step in Darwin's formulation of the theory, even though he was, in all probability, unaware of their existence. What is more, adopting the methodology of Cognitive Linguistics will allow not only to describe the metaphors but also to show relations between them and to demonstrate their systematicity.

This study focuses on ontological metaphors found in Darwin's *The Origin of Species*. While some references will be made to structural and orientational metaphors, the main objective is to reveal those ontological metaphors which must have constituted a first conceptual step in creating the whole theory. Following Szwedek (2000), we are going to demonstrate the relevance of the process of objectification (ontologisation) for building higher-order metaphors. This makes this paper part of a larger study devoted to the whole system of metaphors in Darwin's theory, and further, to metaphors and blends employed by the contemporary theory of evolution.

The analysis is structured in the following way. First, the assumptions of the Conceptual Metaphor Theory and the Blending Theory are presented. A brief account of Darwin's *Origin* and fundamental information concerning his theory of Natural Selection will follow. Next, ontological metaphors identified in the text will be presented and analyzed. The conclusions close the study.

## 2. The assumptions of conceptual metaphor theory and blending theory

Within cognitive linguistics and in what is sometimes called Conceptual Metaphor Theory (Grady et al. 1999; Evans and Green 2006), metaphor has been defined as a set of correspondences or conceptual mappings between two conceptual domains: the source and the target domain. (cf. Lakoff and Johnson 1980; Lakoff and Turner 1989; Lakoff 1993, Mendoza Ibáñez 2000). The source domain, which is typically more concrete, helps to structure the target domain, which is more abstract. As a result of this structuring, we talk and reason about the target in terms of conceptual (and inferential) structure of the source[1]. Metaphor, defined as a cognitive process, proved to be "pervasive in everyday life, not just in language, but in thought and action" (Lakoff and Johnson 1980: 3), as well as "one of our most important tools for trying to comprehend partially what cannot be comprehended totally" (Lakoff and Johnson 1980:193).

The years of investigation in the field of cognitive metaphors and their linguistic manifestations have revealed that the stock of common source metaphors used in conventional structuring target concepts is limited. Kövecses (2002: 16-20) lists the following common source domains: the human body, health and illness, animals, plants, buildings and constructions, machines and tools, games and sport, money and economic transactions, cooking and food, heat and cold, light and darkness, forces, movement and direction. As we are going to see, some of these source domains were used by Darwin in his theory.

Following Lakoff and Johnson (1980) and Kövecses (2002: 29-42), metaphors can be classified according to the conventionality, function, nature, and level of generality. The second parameter is particularly relevant for the study as hand. On the basis of the cognitive function they perform, three kinds of metaphors have been distinguished: structural, ontological, and orientational[2]. Structural metaphors are the ones in which the source domain provides a relatively rich knowledge for the target concepts and whose cognitive function is to facilitate understanding. The metaphor LOVE IS A JOURNEY

[1] As a matter of convention, conceptual metaphors are represented with the form TARGET DOMAIN IS A SOURCE DOMAIN, e.g. LIFE IS A JOURNEY. Such notation is employed throughout this paper.

[2] For the first time this distinction was introduced by Lakoff and Johnson 1980.

discussed above is a structural metaphor and so are all other metaphors mentioned so far. The cognitive function of ontological metaphors is to give ontological status to abstract, vague concepts, which means that our abstract experience can be conceived in terms of objects, substances, and containers. This, in turn, allows us to identify and quantify such vague concepts and experience, and further structure them by means of structural metaphors. In this way, ontological metaphors constitute a first and, apparently, a necessary step in constructing a conceptual metaphor. We shall return to this issue when discussing specific instances of ontological metaphors in Darwin's *Origin*. Container metaphors (e.g. *He is in love*) and personification (e.g. *Life has cheated me*) are perhaps the best known ontological metaphors. Finally, the cognitive function of orientational metaphors is to make a set of target concepts coherent in our conceptual system, usually by making reference to basic human spatial orientation, such as up-down, front-back, center-periphery, etc. For example, expressions such as *Speak up, Keep your voice down* illustrate the orientational metaphors MORE IS UP; LESS IS DOWN.

Irrespective of their type, conceptual metaphors tend to form larger systems. Two such systems relevant for this study are described in the literature: the "Great Chain of Being" metaphor and the "Event Structure" metaphor (Lakoff 1990, 1993; Lakoff and Turner 1989, Krzeszowski 1997; Kövecses 2002). The Great Chain of Being metaphor, which accounts for how objects in the world are conceptualized metaphorically, is based on a folk theory of how objects (in the broadest meaning of the word) are related to each other in the world. This folk theory, going back to the Jewish-Christian tradition, arranges beings of the world into a hierarchy, with god(s) at the top and humans, animals, plants, complex objects and natural physical things occupying successively lower levels. While this system in itself is not a metaphor, it easily gives rise to metaphors when beings from one level are conceptualized as beings from a lower or higher level (e.g. people are often conceptualised as animals as in *She's a bitch*; complex objects as plants *The economy flourished*, God as a human being as in God the Shepherd, etc.). The Event Structure metaphor system, which describes how events and changes of states are metaphorically understood, has various aspects of events as its target domain. These aspects of events such as change of state, causes of changes, action, purpose of action, etc.

are understood metaphorically in terms of such physical concepts as location, force, and motion. Selected examples include:

| | |
|---|---|
| STATES ARE LOCATIONS: | *They are in love.* |
| CHANGES ARE MOVEMENTS: | *He went crazy.* |
| CAUSES ARE FORCES: | *The hit sent the crowd into frenzy.* |
| PURPOSES ARE DESTINATIONS: | *He finally reached his goal.* |
| MEANS ARE PATHS: | *She went through fat to thin through an intensive exercise programme.* |

Exhaustive as it may seem, Conceptual Metaphor Theory was found to be insufficient for some types of analyses, and it became supplemented by the Blending Theory proposed by Fauconnier and Turner (1998; 2002). As Grady et al. (1999) rightly observe, Blending Theory shares many of the aspects of Conceptual Metaphor theory: both approaches treat metaphor as a conceptual phenomenon; both involve systematic projection of language, imagery, and inferential structure between conceptual domains; both propose some constraints on this projection. However, there are significant differences. Firstly, Blending Theory allows for an analysis of cognitive and linguistic processes exceeding conceptual metaphors. As Fauconnier and Turner claim, blending (or conceptual integration) is one of the most fundamental cognitive processes responsible not only for linguistic creativity, but also for art, science and religion. Secondly, Blending Theory allows for projections between more than just two conceptual domains. What is more, these projections are not directional (i.e. they do not have to operate in one direction only – from the source domain to the target domain – which is inherent in Conceptual Metaphor Theory). Finally, Blending Theory emphasizes conceptual integration as an on-line process, offering in this way analytical tools which can account for both entrenched metaphors and for short-lived and novel conceptualizations.

In Blending Theory, the basic unit of cognitive organization is not the domain but the mental space defined as "a small conceptual packet constructed as we think or talk, for purposes of local understanding and action" (Fauconnier and Turner 2002:40). In a minimal integration network there are four mental spaces: two input spaces, a generic space and a blended space (or a blend). Elements in one input space are connected by cross-space mappings to their counterparts in the other

input space. The generic space maps onto each of the inputs and contains what they have in common. The fourth mental space, the blend, contains elements projected from the two inputs and develops emergent structure absent from the inputs. The four mental spaces together with cross-space mappings and the emergent structure constitute an entire integration network. "Building an integration network involves setting up mental spaces, matching across spaces, projecting selectively to the blend, locating shared structures, projecting backwards to inputs, recruiting new structure to the inputs or the blend, and running various operations in the blend itself" (Fauconnier and Turner 2002:44).

Conceptual Metaphor Theory and Blending Theory do not compete with each other. To the contrary, they complement each other, offering a selection of tools for an in-depth analysis. When investigating Darwin's text, we are going to employ the explanatory power of both these theoretical stances. Having presented the notions and theoretical constructs indispensable in our study we turn to Darwin's text. First, some basic information about his theory and the book *The Origin of Species* will be provided and then a linguistic analysis of the text will follow.

## 3. A brief account of Darwin's theory as presented in *The Origin of Species*[3]

*On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*, which is the full title of Darwin's book, was published for the first time in November 1859. While the book was revised and altered several times by Darwin himself, this first edition is the basis of contemporary editions and of this analysis as well.

What Darwin wanted to demonstrate through seasoned argument and piles of evidence was that species of plants and animals as people know them have appeared by gradual process of genetic differentiation and selection under environmental pressures. In contrast to the views dominating at his time, Darwin claimed that organisms had not been created at the beginning of time or at several moments in the past, but

[3] The basic facts concerning Darwin's theory and the content of *Origin* come from the Introduction to 1998 edition of Charles Darwin's *The Origin of Species* by Gillian Beer and Encyclopaedia Britannica.

were a result of small changes, which were accumulated over vast expanses of time and gave rise to various varieties, races, and species. The kind of changes that become maintained in subsequent generations depends on struggle for life among organisms and preservation of the fittest organisms (fittest in the sense of being best suitable for a given environment).

Volumes have been written on the subject of how various authors and ideas influenced Darwin. The originality of Darwin's thought has been questioned, too. We do not want to get involved in these considerations, because for our study it is irrelevant whether metaphors we encounter in the book were Darwin's own or whether he was inspired by some external sources.

The idea of looking at Darwin's text through the language he uses is not new, nor is the idea of treating some aspects of his argument as metaphors. This is the focus of the fundamental study of R. M. Young *Darwin's Metaphor: Nature's Place in Victorian Culture.* Young devotes much attention to anthropomorphic, voluntarist descriptions of natural selection because, as he claims, "the terms in which it is expressed had important consequences for the nature and the reception of the theory" (1985:87). Young lists three reasons why Darwin wrote about natural selection in this fashion (1985:98-99). First, it was a result of an analogy Darwin draws between human selection of desired traits in domesticated animals and plants, and natural selection. We return to this analogy in our analysis below. The second reason is the strong influence of the tradition of natural theology on the assumptions of science. Finally, it allowed him to present natural selection as if it was a real mechanism. Whatever the reasons, Young points out that Darwin's choice of metaphorical language in his description of natural selection caused, on the one hand, criticism and misunderstandings and, on the other, "had given his interpreters a warrant for their views on designed evolution" (1985:110) much to Darwin's resentment.

While Young's study breaks new ground in the study of Darwin's theory, it covers only one obvious metaphor employed by Darwin. We believe that there are many more metaphors present in Darwin's work, which grant his theory a coherent shape. To uncover them we need the apparatus of Cognitive Linguistics.

## 4. Ontological metaphors in Darwin's *The Origin of Species*

### 4.1 Objectification

As we have already stated ontological metaphors give ontological status to abstract or vague concepts and thus constitute a first and necessary step in constructing a conceptual metaphor. While such ordering of metaphorisation seems only natural, surprisingly this is by no means a widely accepted view. Lakoff and Johnson (1980) treat structural, orientational and ontological metaphors as having equal, independent status, though they almost admit the primacy of ontology for metaphor processing when they say that "Once we can identify our experiences as entities or substances, we can refer back to them, categorise them, group them, and quantify them – and by this means, reason about them" (Lakoff and Johnson 1980:25). Kövecses is closer to recognising the unique status of ontological metaphors when he explicitly states that the experience conceptualised by ontological metaphors can be structured further by means of structural metaphors (2002:35). However only Szwedek (2000) convincingly demonstrates that "before structural and orientational metaphors (relational in nature) can be formed, some OBJECTIFICATION (ontologisation) of the relevant concepts is necessary" (2000: 143) and that "ontological metaphors underlie both structural and orientational metaphors" (2000:144).

Szwedek reanalyses the structural metaphor ARGUMENT IS WAR discussed by Lakoff and Johnson (1980) and observes that both domains of the metaphor "are EVENTS (or ACTIVITIES) which are first objectified (i.e. conceptualised as objects for general reference). (...) Once WAR and ARGUMENT are conceptualised as objects, their internal structure, both static (object, container, etc.) and dynamic (event, activity), can be introduced in the process of metaphorisation" (2000:145-146). Thus, as Szwedek further claims, "in structural and orientational metaphors, the target domain (if non-physical in nature) is first objectified (given an ontological status of an object), before further aspects can be elaborated" (2000:147).

We can safely assume that generalisations concerning regularities in the world of nature and speculations about the origins of life as we know it constitute a non-physical, abstract and vague target domain. Therefore, the only way to talk about them and to create a coherent theory is through the ontological metaphorisation, i.e.

assigning an entity (state, process, structure, abstract, etc) some mode of existence (Szwedek 2000:147). In the following sections we are going to demonstrate the numerous examples of ontological metaphorisation employed by Darwin in presenting his theory.

### 4.2 NON-PHYSICAL CONCEPTS ARE PHYSICAL OBJECTS

Throughout Darwin's work we can encounter a multitude of examples in which non-physical or abstract concepts or phenomena are conceptualised as physical and manipulable objects. Instinct, for example, can be produced (1), acquired (2), transmitted (3), or lost (4) [4]:

1. No complex instinct can possibly be produced through natural selection, except by the slow and gradual accumulation of numerous, slight, yet profitable, variations. [171]

2. Hence, we may conclude, that domestic instincts have been acquired… [176]

3. But it would be the most serious error to suppose that the greater number of instincts have been acquired by habit in one generation, and then transmitted by inheritance to succeeding generations. [171]

4. ... and natural instincts have been lost partly by habit, and partly by man selecting and accumulating during successive generations, peculiar mental habits and actions, [176]

Apart from the instinct, this process of ontological metaphorisation was applied to many concepts, for example to differences, which can be accumulated (5), modifications, which can be acquired and transmitted (6), characters, which can reappear or be lost (7):

5. ...(refuse) to sum up in their minds slight differences accumulated during many successive generations [26]

6. ...so that it could never have transmitted successively acquired modifications of structure or instinct to its progeny [193]

[4] The figures in square brackets at the end of each quotation refer to page numbers in the 1998 edition of Darwin's *Origins*.

7. …characters should reappear after having been lost for many, perhaps for hundreds of generations… [131]

However, out of many objectifications found in the text, the most crucial for the theory is objectification of variations(s). In Darwin's theory, objectified variations are talked of as valuable objects, like heritage or dowry[5]. As such, variations (but also modifications or deviations from the structure) can be of service to the species (8), can be good for the individual possessor (9), can be profitable (10 - 12), useful (13), or advantageous (14) to an organic being possessing it, and can favour individuals (15 ).

8. Variations are of service to the species [40]

9. Nothing at first can appear more difficult to believe than that the more complex organs and instincts should have been perfected, not by means superior to, though analogous with, human reason, but by the accumulation of innumerable slight variations, each good for the individual possessor. [371]

10. Owing to this struggle for life, any variation, however slight, and form whatever cause proceeding, if it be in any degree profitable to an individual of any species… [52]

11. … by accumulation of profitable variations at that age, and by their inheritance at a corresponding age… [72]

12. ...that slight modifications of instinct might be profitable to a species... [171]

13. I have called this principle, by which each slight variation, if useful, is preserved, by the term of Natural Selection, in order to mark its relation to man's power of selection [52]

14. Natural selection acts solely through preservation of variations in some way advantageous, which consequently endure. [90]

15. …every slight modification (…) which in any way favoured the individuals on any of the species,(...) would tend to be preserved [68]

[5] Later in Darwin's work this meaning is strengthened by the structural metaphor of the family, which deserves a separate study.

Such positive variations, just like family fortune, become accumulated (16 - 21), preserved (22 - 25) transmitted, (26), and inherited (27, 28).

16. (refuse) to sum up in their minds slight differences accumulated during many successive generations [26]

17. No complex instinct can possibly be produced through natural selection, except by the slow and gradual accumulation of numerous, slight, yet profitable, variations. [171]

18. Nothing at first can appear more difficult to believe than that the more complex organs and instincts should have been perfected, not by means superior to, though analogous with, human reason, but by the accumulation of innumerable slight variations, each good for the individual possessor. [371]

19. …why should we doubt that variations in any way useful to beings, under their excessively complex relations of life, would be preserved, accumulated, and inherited? [379]

20. …after intervals long enough to have allowed the accumulation of a considerable amount of divergent variation [98]

21. ...the difficulty lies in understanding how such correlated modifications of structure could have been slowly accumulated by natural selection [193]

22. I have called this principle, by which each slight variation, if useful, is preserved, by the term of Natural Selection, in order to mark its relation to man's power of selection [52]

23. Natural selection acts solely through preservation of variations in some was advantageous , which consequently endure. [90]

24. …lastly, that there is a struggle for existence leading to the preservation of each profitable deviation of structure or instinct. [371]

25. …every slight modification (…) which in any way favoured the individuals on any of the species, (...) would tend to be preserved [68]

26. ..so that it could never have transmitted successively acquired modifications of structure or instinct to its progeny [193]

27. … by accumulation o profitable variations at that age, and by their inheritance at a corresponding age… [72]

28. ...inherited variations of instinct in a state of nature... [173]

The variations can also be negative: they can be of disservice to the species (29) or they can be injurious to the species (30, 31) and as such they are destroyed or rejected.

29. …variations are of disservice to the species [40]

30. …any variation in the least degree injurious would be rigidly destroyed [67]

31. …rejection of injurious variations… [68]

The objectification of variations (or modifications) constitutes the foundation of Darwin's theory and a springboard for other, more specific metaphors. Recall that what Darwin hoped to demonstrate was that various species were not created as finished products (once or several times in the history) but that they undergo changes. These changes or modifications, slight and unnoticeable in one generation, add up in successive generations and result in appearance of new species. We have to realize, however, that a variation in itself is not a physical object. It obtains only as an achievement of imagination and memory of an observer, as a result of comparison between two items, which are perceived as dissimilar along some parameters, registering the difference and remembering it. Once identified, the variation is granted the ontological status. Most probably, this was done by Darwin in an unconscious way, on grounds of universal psychological tendency to objectify what it abstract on the one hand, and in accordance with analogous objectifications in the English language[6]. The status of a physical object allows for employing all experiential knowledge we have

[6] Cases of ontological metaphorisation of this type are the most common metaphors in language (the English language or any other) and at the same time the least noticeable. Kövecses (2000:35) gives examples such as *my fear* or *your fear* when the emotion of fear is conceptualised as an object which can be possessed, *I'm in two minds* (A NONPHYSICAL ENTITY IS A PHYSICAL OBJECT), *going to the race* (EVENT IS A PHYSICAL OBJECT), *giving someone a call* (ACTION IS A PHYSICAL OBJECT), etc.

concerning interaction with things, such as accumulation, preservation, transmission, etc. which was clearly visible in the examples above.

### 4.3 Metaphors of the Great Chain of Being

Apart from ontological metaphorisation on the general level discussed above, Darwin's work reveals more specific ontological metaphors, i.e. personification and reification stemming from the Great Chain of Being. As we explained in Section 2, the Great Chain of Being folk model is an arrangement of beings and entities of the world into a hierarchy. Because the Great Chain of Being consists of a number of well-delineated levels in vertical alignment (i.e. god(s), people, animals, plants, objects), it is possible to conceive of one level (target domain) in terms of a higher or lower level (source domain). Darwin's theory, which entails the Great Chain of Being model as part of Darwin's cultural background, makes use of two such mappings: p e r s o n i f i c a t i o n (when the level of human beings is employed as the target domain) and r e i f i c a t i o n (when the level of physical objects functions as the source domain).

#### 4.3.1 Personification

While objectification may be called the foundation of Darwin's theory, personification of nature[7] and processes involved in functioning of living organisms and their interrelations constitute one of its supporting pillars.

In many places in Darwin's text we may encounter nature conceptualized as a human being, capable of intentional actions. Personified Nature can act in the most general meaning (32, 33) or in a more specific way (34 - 37).

32. Nature acts uniformly and slowly during vast periods of time on the whole organisation, in any way which may be for each creature's own good... [218]

[7] Personification of Nature is obviously not Darwin's idea. It is probably one of the earliest personifications produced by the human mind, and we mean here not just well-documented personifications coming from the ancient Greek or Roman culture, but also those coming from the dawn of human civilization.

33. …and then nature acts on the organisation, and causes variability. [377]

34. ...nature has largely provided against it by giving to trees a strong tendency to bear flowers with separated sexes [83]

35. Though nature grants vast periods of time for the work of natural selection she does not grant an indefinite period ... [84]

36. Nature may be said to have taken pains to reveal, by rudimentary organs and by homologous structures, her scheme of modification, which it seems that we wilfully will not understand. [388]

37. Nature acts uniformly and slowly during vast periods of time on the whole organisation, in any way which may be for each creature's own good; and thus she may, either directly, or more probably indirectly, through correlation, modify the reproductive system in the several descendants from any one species. Seeing this difference in the process of selection, as carried on by man and nature, we need not be surprised at some difference in the result. [218]

However, the most fruitful personification employed by Darwin is NATURE IS A BREEDER/GARDENER, which, in turn, stems from a complex analogy between "human selection under domestication" and processes observed by Darwin in the natural environment. In order to clarify this analogy we have to quote a longer passage from *The Origin of Species*:

38. As man can produce and certainly has produced a great result by his methodical and unconscious means of selection, what may not nature effect? Man can act only on external and visible characters: nature cares nothing for appearances, except in so far as they may be useful to any being. She can act on every internal organ, on every shade of constitutional difference, on the whole machinery of life. Man selects only for his own good; Nature only for that of the being which she tends. Every selected character is fully exercised by her; and the being is placed under well-suited conditions of life. Man keeps the natives of many climates in the same country; he seldom exercises each selected character in some peculiar and fitting manner; he feeds a long and a short beaked pigeon on the same food; he does not exercise a long-backed or long-legged quadruped in any peculiar manner; he exposes sheep with long and short wool to the same climate. He does not allow the most vigorous males to struggle for the females. He does not rigidly destroy all inferior animals, but protects during each varying season, as far as lies in his power, all his productions. He

> often begins his selection by some half-monstrous form; or at least by some modification prominent enough to catch his eye, or to be plainly useful to him. Under nature, the slightest difference of structure or constitution may well turn the nicely-balanced scale in the struggle for life, and so be preserved. How fleeting are the wishes and efforts of man! how short his time! and consequently how poor will his products be, compared with those accumulated by nature during whole geological periods. Can we wonder, then, that nature's productions should be far "truer" in character than man's productions; that they should be infinitely better adapted to the most complex conditions of life, and should plainly bear the stamp of far higher workmanship? [69-70]

We have to bear in mind Darwin's rationale for adopting this analogy: his objective when writing *The Origin of Species* was to present a convincing alternative to the conviction dominating at the time that all species of animals and plants were not only created, but were also immutable – they never changed but retained the form they obtained from God. Darwin's line of reasoning was straightforward: if people can, by careful selection, produce new varieties of existing domestic species, then the same can also happen in nature, especially if we take into account the vast expanses of time involved. The only problem that this analogy offered concerned the role of the agentive force standing behind the "production of species" in nature, that is the equivalent of the human breeder or gardener. In the first chapters of *The Origin of Species* this role is performed by personified Nature, which is seen in (38). However, in the course of Darwin's argument Natural Selection becomes personified as the major agent in the state of nature. Indeed, even the number of examples illustrating the Natural Selection as an agent is significantly greater than those which personify nature or other natural force or phenomenon[8]. Yet before we turn to the concept of the Natural Selection let us investigate the personification of Nature in greater detail by resorting to Blending Theory.

[8] For the purpose of this study 87 examples were considered. There are many more in the text of *The Origin of Species* but because they are highly repetitive they were not counted. At the same time only 20 personifications of nature were found. We also found 14 cases in which a concept other than Natural Selection functions as an agent.

The metaphor NATURE IS A BREEDER/GARDENER is a blend with two input spaces. The first input is obvious – this is the one with the human breeder/gardener. Establishing input two is more of a challenge. We claim that the second input comprises the pre-existing conventionalized blend of Mother Nature as a giver of life. The inputs and the resulting blend are presented in Table 2.

| **Input 1 Mother** | **Input 2 Nature** | **The Blend Mother Nature** |
|---|---|---|
| gives birth to a baby – a new life | new life appears | new life appears |
| a human being | | a person |
| female | | a female |

**Table 1.** The blend "Mother Nature"

The integration network underlying the metaphor NATURE IS A BREEDER/GARDENER is presented in Table 2.

| **Input 1 Human breeder/gardener** | **Input 2 Mother Nature** | **Input 3 Observable facts** | **The Blend Nature is a Breeder/Gardener** |
|---|---|---|---|
| a human being | a female, a person | | a "she" |
| breeder/gardener | | | breeder/gardener |
| taking care for his animals or plants | motherly care for all life | | |
| consciously selecting desired traits | | | selection of traits good for an organism |
| new varieties are produced | new life is born | species exist | new species are produced |
| new varieties are better (for man) than the earlier ones | | | new species are superior to earlier species |

| | | | |
|---|---|---|---|
| new varieties replace the earlier (inferior) ones | | | replacement of earlier forms (extinction) |
| improvement | | species in the past were different | improvement |

**Table 2.** NATURE IS A BREEDER/GARDENER

Adopting this analogy and the resulting blend has far-reaching consequences for the Darwin's theory and his interpretation of observations in the world of nature. As we can see in Table 2 the blend is dominated by the frame of the human breeder/gardener. The emergent personification is that of Nature selecting features good for organisms and so producing new species. New species are better than the earlier ones and so they replace their predecessors. In this way extinction can be interpreted as a natural outcome of evolution, and not as a disaster. The idea of i m p r o v e m e n t in the process of selection and production of new species is very strong in the blend and became the hallmark of the whole theory of evolution for decades.

Darwin frequently talks about improvement, meaning both the improvement of domestic varieties by human selection and selection under nature. The words "improve" and "improvement" appear in the text of *Origin* 85 times. Improvement under domestication is exemplified by (39, 40) and improvement under nature by (41, 42):

39. ... (breeders) may make great improvements... [28]

40. … in plants the same gradual process of improvement through the occasional preservation of the best individuals [32]

41. On the theory of natural selection the extinction of old forms and the production of new and improved forms are intimately connected together [256]

42. ... two varieties are supposed (…) to be converted and perfected into two distant species [144]

The metaphor NATURE IS A BREEDER/GARDENER coexists with the metaphor NATURE IS AN ARTISAN exemplified in (43-46).

43. ...[nature's productions] should be infinitely better adapted to the most complex conditions of life, and should plainly bear the stamp of far higher workmanship [70]

44. …but these have almost everywhere largely yielded to the more dominant forms, generated in the larger areas and more efficient workshops of the north [307]

45. Here almost every product of the land and water bears the unmistakeable stamp of the American continent. [322]

46. … why should the species which are supposed to have been created in the Galapagos Archipelago, and nowhere else, bear so plain a stamp of affinity to those created in America? [322]

This metaphor, while marginal and infrequent in comparison with the previous one, is closely connected with the ontological metaphor ORGANISMS ARE MACHINES which we discuss below.

The image of Nature that emerges from that personification as well as other remarks throughout the work is far from benign. The cruelty of Nature is well visible in the following statement:

47. The face of Nature may be compared to a yielding surface, with ten thousand sharp edges packed close together and driven inwards by incessant blows sometimes one wedge being stuck, and then another with great force.[9]

While the personification of Nature as Breeder/Gardener fulfilled the role of an agentive power giving rise to new species, it was too general and unscientific to be much of an alternative to the view of God-Creator. That is why, starting with Chapter 4 of *The Origin of Species*, the agent role is assumed by Natural Selection. Natural Selection, which originally simply meant a selection of desirable traits and variations in nature, analogous to that exercised by a human breeder/gardener, soon becomes the driving power and universal law responsible for appearance of new species of plants and animals.

Darwin defines Natural Selection in the following way: "I have called this principle, by which any slight variation, if useful, is

[9] Interestingly, this sentence is absent from the Oxford edition of Darwin's *Origin*, though it is preserved in 2005 edition of collected works by Charles Darwin *Darwin: The Indelible Stamp*, where it can be found on page 381.

preserved, by the term of Natural Selection, in order to mark its relation to man's power of selection" (Darwin 1998:52) and further: "This preservation of favourable variations and the rejection of injurious variations, I call Natural Selection." (1998:68) While this introductory definition is fairly modest, it soon becomes obvious that for Darwin Natural Selection is a really existing powerful agentive force, which is visible in the examples below:

48. …the power of steady selection to keep the breed true [125]

49. …have been acquired by natural selection, --a power which acts solely by preservation of profitable variations in the struggle for life [167]

50. I have such faith in the powers of natural selection, that...[193]

51. ...in order to show the power of natural selection [197]

52. …during the constantly-recurrent Struggle for Existence, we see the most powerful and ever-acting means of selection. [377]

Once Natural Selection is granted the power to act, Darwin extends this ability to many specific actions, especially those shaping the appearance of organisms:

53. Natural selection can modify and adapt ... [72], [73]

54. ...fingers and fore-arm of the Galeopithecus might be greatly lengthened by natural selection [148]

55. ...the habit of collecting pupae originally for food might by natural selection be strengthened and rendered permanent for the very different purpose of raising slaves. [182]

56. …natural selection will always succeed in the long run in reducing and saving every part of the organisation [122]

57. …and in this case natural selection would continue slowly to reduce the organ, until it was rendered harmless and rudimentary. [368]

58. the eye of an eagle might be formed by natural selection [153]

59. …that natural selection has converted the simple apparatus of an optic nerve merely coated with pigment and invested by transparent

membrane, into an optical instrument as perfect as is possessed by any member of the great Articulate class ... [153]

60. ...little folds of skin (...) have been gradually converted by natural selection into branchiae...[157]

This capacity to shape organisms ultimately means that Natural Selection is responsible for appearance of new species (or production[10] of new species to use Darwin's favorite wording), as illustrated by the following examples:

61. But natural selection can and does often produce structures for the direct injury of other species [163]

62. Natural selection will never produce in a being anything injurious to itself, for natural selection acts solely by and for the good of each [163]

63. Natural selection will produce nothing in one species for the exclusive good or injury of another; though it may well produce parts, organs, and excretions highly useful… [167]

64. Natural selection in each well-stocked country, must act chiefly through the competition of the inhabitants one with another, and consequently will produce perfection, or strength in the battle for life, only according to the standard of that country [167]

65. ...having been produced in greater and greater numbers through the natural selection of the parents which generated them [196]

[10] Throughout his work Darwin consistently uses the word "produce" to talk about the appearance of species or varieties, and "productions" referring to all living organisms. We attribute this choice of vocabulary to two potential sources: one results from the analogy between human selection and natural selection; the other reason may be a conscious avoiding of the words "create" and "creatures" obviously connected with the doctrine of immutability of species and creationism. By way of comparison: the words "produce" and "production" appear in the text of *The Origin of Species* 232 and 161 times respectively. The word "create" appears only 52 times (and in addition almost exclusively in connection with the views of Darwin's opponents), and the word "creature" appears 8 times in the whole text.

This production is done by accumulation of differences in structure (66) and accumulation of profitable variations and modifications (67, 68) which take place in small steps (69).

66. I attribute the passage of a variety (...) to the action of natural selection in accumulating differences of structure in certain definite directions [44]

67. Natural selection will then accumulate all profitable variations [110]

68. Therefore I can see no difficulty, under changing conditions of life, in natural selection accumulating slight modifications of instinct to any extent, in any useful direction. [197]

69. Thus, as I believe, the most wonderful of all known instincts, that of the hive-bee, can be explained by natural selection having taken advantage of numerous, successive, slight modifications of simpler instincts; natural selection having by slow degrees, more and more perfectly, led the bees to sweep equal spheres at a given distance from each other in a double layer, and to build up and excavate the wax along the planes of intersection. [191]

What is more, such actions are directed and purposeful: what is desired becomes preserved (70-74), that which is undesirable is rejected (75) and destroyed (76, 77) or exterminated (78).

70. Natural selection will always tend to preserve all individuals varying in the right direction [85]

71. …natural selection will continually tend to preserve those individuals which are born with constitutions … [116]

72. ...natural selection should have preserved or rejected each little deviation [122]

73. As natural selection acts by life and death—by the preservation of individuals with any favourable variation... [159]

74. …there will be a constant tendency in natural selection to preserve the most divergent offspring of any one species. [380]

75. ...natural selection should have preserved or rejected each little deviation [122]

76. …natural selection destroying any which depart from the proper type [86]

77. As natural selection acts by life and death—by the preservation of individuals with any favourable variation, and by the destruction of those with any unfavourable deviation of structure [159]

78. …the very process of natural selection tends (…) to exterminate the parent forms and the intermediate links [146]

As we can see from the amassed evidence, the characteristics of Natural Selection go much beyond a description of a natural phenomenon or a regularity observed in nature. We are dealing here with a personification akin to that we saw in the case of Nature. Natural Selection, just like a human breeder or gardener (79) scrutinizes (80), is efficient (81) and becomes successful (82, 83). There are, however, limitations to its power: (84-87).

79. ...and natural selection will pick out with unerring skill each improvement... [154]

80. It may be said that natural selection is daily and hourly scrutinising throughout the world, every variation, ... [70]

81. ...I should have never anticipated that natural selection could have been efficient in so high a degree, had not the case of these neuter insects convinced me of the fact. [197]

82. …natural selection will always succeed in the long run in reducing and saving every part of the organisation [122]

83. …that natural selection may perfectly well succeed in largely developing any organ [122]

84. Unless profitable variations do occur, natural selection can do nothing [69]

85. …for otherwise natural selection can do nothing [93]

86. …for in such cases natural selection either has not or cannot come into full play [125]

87. Natural selection cannot possibly produce any modifications in any one species exclusively for the god of another species [163]

An interesting observation emerges from the examples discussed above: even though Darwin defines Natural Selection as a principle analogous to human selection under domestication, we can see that the correspondences are not between the natural and human selection, but between the human breeder himself and Natural Selection. When talking about selection under domestication, Darwin never depicts it as an independent power: it is the human breeder/gardener who selects desired animals or plants, and decides which traits are desired and good for him. Analogically, we have seen above that Natural Selection is conceptualized as an agentive force with a will of its own. However, even though it is tempting to draw a correspondence line between the human breeder/gardener and Natural Selection, Natural Selection as depicted by Darwin is not a personification of the sort we encountered when dealing with the personification of Nature. It is visible even in the way Darwin talks about it: he never uses the personal pronoun *she* but consistently uses *it*. How can we then explain all the examples listed above in which Natural Selection functions as an agent? We believe that because Darwin defined Natural Selection as a principle, it came naturally to him to attribute it with causative powers by virtue of the conventional metaphor LAW IS AN AGENT visible every time people talk about laws governing or forcing someone to do something or laws of physics (e.g. the law of gravity which makes objects fall, etc.)

The metaphor of Natural Selection builds up on the previously discussed ontological metaphor DESIRED TRAITS ARE (VALUABLE) OBJECTS and DIFFERENCES ARE (VALUABLE) OBJECTS. The objectified differences or traits become accumulated in the course of time and the power responsible for that accumulation is the Natural Selection. In this way Darwin answers the question of how new species come to existence. However, the questions of why it happens and who or what decides which traits or variations are desirable for an organism are still open. In order to answer these questions Darwin needed to introduce the structural metaphor of struggle. However, this metaphor deserves an in-depth analysis in a separate study.

Apart from personification of Nature and Natural Selection functioning as agents, there are examples of inanimate objects or natural phenomena such as climate (88), conditions life (89), instinct (90-92),

habit (93), modification (94, 95) or change (96, 97) conceptualized as agents.

88. ... climate acts in main part indirectly by favouring other species [58]

89. Such facts show how indirectly the conditions of life must act [110]

90. ...that instinct impels the cuckoo to migrate and to lay eggs in other birds' nests. [169]

91. ...namely, the instinct which leads the cuckoo to lay her eggs in other birds' nests [176]

92. ...if a slight modification of her instinct led her make her waxen cells near together... [191]

93. In some cases compulsory habit alone has sufficed to produce such inherited mental changes; in other cases compulsory habit has done nothing (...) but in most cases, probably, habit and selection have acted together [176]

94. Every slight modification (...) which in any way favoured the individuals of any of the species, by better adapting them to their altered conditions ... [68]

95. Extremely slight modifications in the structure or habit of one inhabitant would often give it advantage over others, and still further modifications of the same kind would often further increase the advantage [69]

96. ...that the change in the conditions of life, by specially acting on the reproductive system, causes or increases variability ... [68]

97. Nor do I believe that any great physical changes, as of climate, or any unusual degree of isolation to check immigration is actually necessary to produce new and unoccupied places for natural selection to fill up by modifying and improving some of the varying inhabitants [68]

Such metaphors, though frequent in Darwin's work are marginal for his theory.

### 4.3.2 Reification

Reification (i.e. conceptualizing living organisms in terms of inanimate objects) is another metaphor based on the Great Chain of Being which we want to discuss. This metaphor, which can be framed as A LIVING ORGANISM IS AN INANIMATE OBJECT, is consistent with the personification of Nature and Natural Selection described above. On the one hand, living organisms are seen as passive objects undergoing actions of personified forces of nature. They are formed (98-100), produced (101, 102), manufactured (103-105) or constructed (106-109); there exists a plan for their organization (110), pattern of structure (111) or even a prototype (112).

98. ... species of the same genus have been formed … [47]

99. Each new variety or species, during the progress of its formation will generally press hardest on its nearest kindred, and tend to exterminate them [91]

100. ...that the hand of a man, formed for grasping, [351]

101. … we may believe that the production of new forms has caused the extinction of about the same number of old forms. [259]

102. …and this may be sometimes of importance in the production of new species. [87]

103. …the manufactory of new specific forms has been actively at work [138]

104. ... the process of manufacturing new species to be a slow one…[47]

105. …for where the manufactory of species has been active, we might expect, as a general rule, to find it still in action; and this is the case if varieties be incipient species. [379]

106. …animals (…) that are constructed for twilight [114]

107. We see the same great law in the construction of the mouths of insects... [351]

108. ...yet all these organs, serving for such different purposes, are formed by infinitely numerous modifications of an upper lip, mandibles, and two

pairs of maxillae. Analogous laws govern the construction of the mouths and limbs of crustaceans. [351]

109. ...they [cirripedes] again obtain a well-constructed mouth... [357]

110. We have seen that the members of the same class, independently of their habits of life, resemble each other in the general plan of their organisation. [351]

111. Nothing can be more hopeless than to attempt to explain this similarity of pattern in members of the same class... [352]

112. …varieties, the supposed prototypes and parents of future well-marked species [92]

It becomes apparent from these examples that organisms are not just reified, but they are specifically conceptualized as pieces of machinery, and that life as such is understood is terms of the industrial metaphor. This is explicitly stated in the two selected examples below:

113. She [Nature] can act on every internal organ, on every shade of constructional difference, on the whole machinery of life [69]

114. The principle, also, of economy, explained in a former chapter, by which the materials forming any part or structure, if not useful to the possessor, will be saved as far as is possible… [368]

We believe that the metaphor A LIVING ORGANISM IS A MACHINE results naturally from personification of Nature in general, and the metaphors NATURE IS AN ARTISAN in particular.

## 5. Conclusion

While this analysis covered only ontological metaphors used by Darwin in formulating his theory, we can venture a number of general remarks. First, we have demonstrated that ontological metaphors, both those general (that is objectification) and those more specific (such as personification and reification), constitute the essential part of Darwin's theory. While objectification of changes, modifications, and variations in organisms presupposes all other complex metaphors, personified Natural Selection is presented as a creative force juxtaposed with the

concept of personified God-Creator. Secondly, the idea of improvement inherent in the theory is licensed by personification of Nature, personification of Natural Selection, and the whole analogy with human selection. Finally, we can conclude that the metaphors employed by the author of *The Origins of Species* are conventional conceptual metaphors. That is why the theory was easily understood by readers even though not necessarily accepted.

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# Phonological structure in Cognitive Grammar or nothing new under the sun

## Introduction

When Noam Chomsky initiated his generative grammar programme in the late 1950s, few could expect that it was to dominate the linguistic scene for the two decades to come. It was not until the late 1970s that the phonological theory presented in *The Sound Pattern of English* (SPE, Chomsky and Halle, 1968) was successfully challenged, for example, by Liberman and Prince (1977) with reference to stress and rhythmic phenomena and by Goldsmith's "autosegmental phonology" (Goldsmith, 1976). Then, in the 1980s new theories began to flourish, each of which, more or less modestly, questioned the predecessors' findings and formalisms. These modern approaches include, perhaps among others, Dependency Phonology, Government Phonology, Optimality Theory, Natural Phonology, Beats-and-Binding Theory or the aforementioned Metrical and Autosegmental Phonology. We are witnessing nowadays a real "outpour" of theories and approaches that are heralded as "radical breakthroughs" in linguistics in general and in phonology in particular. Strict adherence to already existing models, especially in the light of accumulating counterevidence, is certainly detrimental to linguistic theory since it hinders progress and speeds up the complete burn-out of any theory. What seems prudent, though, is skeptical evaluation of new formal proposals and fair, open-minded criticism.

New formalisms, in our opinion, should be "arrived at" in the process of critical data analysis and serve the purpose of a "didactic" exposition of a theory. As long as they are not externally (psychologically, neurologically, or otherwise) confirmed, they remain

nothing more but speculations. The less dogmatic and the less biased our research is, the better for the theory of language.

In this light, the cognitive enterprise in linguistics should be welcomed as one that is refreshingly well-grounded in cognitive science, which is hoped to provide theory-external foundations for the explanation of language phenomena, and which has the potential to string together various "branches" of linguistics.

The need to incorporate phonology into the theory which aspires to be *the* theory of language, has finally been recognized.[1] The question is whether it is phonology that needs cognitive orientation to explain phonological processes more convincingly, or cognitive linguistics needs phonology to reach the status of a general theory of language, as openly admitted by Taylor (2007: 93). In the former case both phonology and cognitive linguistics may gain a better research perspective. In the latter, however, there is a danger that phonology will become "a square peg in a round hole" for cognitive linguistics, in which case both will lose a lot by becoming less and less constrained.

In this paper both scenarios are investigated.

## 1. Cognitively-oriented phonology

In the broad sense cognitive linguistics welcomes all theories which in their assumptions agree that language knowledge is represented in the mind. With few exceptions, e.g. bloomfieldian analyses or certain purely formal approaches like glossematics (Hjelmslev 1936, after Fisher-Jørgensen 1975: 114-144),[2] linguistics has always been cognitive. Thus, there is no need nor space for a "cognitive breakthough". In fact, justice should be done to those forgotten pioneers of cognitive linguistics (especially Lamb, 1966 and later 1971), whose research publication was badly-timed and appeared simultaneously with Chomsky's proposals which became *the* theory of the 60s and 70s. Chomsky was simply too fashionable at that time to leave any space for independent competitive analyses. Severe criticism from mainstream linguists, partly provoked by Lamb's extremely tangled theoretical apparatus, sealed his fate. His original ideas were abandoned and Lamb had to wait till much later

[1] Phonological phenomena have not always been considered "cognitive". As implied by Langacker (1987), since phonological units are not themselves meaningful they do not fall into cognitive domain.

[2] Even some strictly formal (more recent) approaches openly recognise the need for cognitive perspective in their research (cf. Levine 1992).

(Lamb, 1998) when his ideas were, at last and at least partly, in line with the cognitive research fashion. For contemporary cognitive linguists, however, (e.g. Taylor, 2007: 20-22) the "neurocognitive linguistics" proposed by Lamb goes too far in its attempts to base the linguistic inquiry on neurology and the ways in which language competence is represented by neurons. The main research dilemma remains: (i) will linguistic analysis lead us to the understanding of the working of human mind, or (ii) will the complete (if ever attainable) description of the functioning of the mind facilitate the formulation of the ultimate theory of language?

If we adapt the broad-sense formulation of the scope of cognitive linguistics, however, Taylor's definition of phonological structure (Taylor 2007: 24) appears unconvincing, if not self-contradictory. It equates phonology with "physical manifestation of language, whose prototypical carrier is sound". Apparently, for him phonology *is* phonetics. Where is, then, the place for a mental representation of the physical act of speaking. Electromagnetic waves do not *create* radio programmes, to use a metaphor.

The problem is not new, though. Taylor implicitly repeats the ever present question of how much phonetics is allowed in phonological analysis and where the border line lies between the two. An interesting, cognitively oriented, attempt is provided by Tatham (1987). The growing distance between linguistics and phonetics follows from the observation that if language is cognitive, then its acoustic, aerodynamic or motor-related phenomena are not, hence they fall outside linguistics. "At most a phonetic model might have an input derived from cognitively oriented phonology" (ibid.). No matter if phonetic facts obtained in some laboratory research are then subject to analysis by phonological models, Tatham continues, or phonetics is called upon to provide arguments for prior phonological theorising, the abstract and the concrete still stand at two antagonistic ends. According to Tatham, it is only possible to bridge the gap if the "lets-go-into-the-lab-and-find-out-how-vocal-cords-work" type of experiment is replaced by a more constrained investigation including, for example, a cognitive manipulation of an abstract parameter, like [voice] in order to find out in what way this parameter is responsible for successful encoding/decoding of sentences.

The problem is, though, that the [voice] parameter *is* phonetic, hence "real". To bypass the problem, Tatham eventually proposes that

"[…] the prime distinguishing mark between phonology and phonetics is not that the one is cognitive and the other is not, for they can be each modeled cognitively or physically depending on which side of […] the line you stay. It is in type of change which the rules specify".[3] With the reservation expressed in the footnote, we generally agree with this division, although it produces an unnecessary dichotomy, i.e. physical phonetics/phonology vs. cognitive phonetics/phonology. Rather than forcibly push phonetics into the arms of (cognitive) phonology, efforts should be made to non-arbitrarily establish the nature of possible phonological phenomena. Then, anything that remains should be given a purely phonetic explanation.

This line of reasoning is found in Kaye's *Phonology: A Cognitive View* (1989). As one may expect, a book that has "cognitive" and "phonology" in the title should at least be critically reviewed, if not wholeheartedly welcomed, by cognitive linguistics, in which the need to incorporate phonology into cognitive research programme has been frequently and explicitly voiced. Unfortunately, the publication has generally passed unnoticed in the cognitive literature (Taylor's 2007 bibliography).[4]

For Kaye (1989: x), the shift towards a "cognitive orientation" in linguistics stems from an ever growing interest in such disciplines as cognitive psychology, child language acquisition or computer science. This influence, he claims, is reciprocally beneficial since linguistic investigation may also be a source of inspiration for purely cognitive disciplines. Linguistic research based on, or at least referred to, external cognitive evidence is able to make stronger claims about language than a theory based on language-internal data analysed with theory-internal tools.[5] As far as phonetics-phonology relation is concerned, Kaye is decidedly phonology-centric, as the quotation below proves:

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[3] It is to be hoped that the use of the word "rule" in this context is just a matter of imprecision on Tatham's part. Otherwise, it would have to be treated as subscribing to the old (generative) theoretical tradition, which, as we understand it, is entirely rejected by cognitive linguistics. Equally awkward is the use of the term 'parameter' without any reference to parametricised approaches, e.g. Government Phonology.

[4] It would be equally futile to look for major cognitive publications by Lakoff or Langacker in Kaye's bibliography. Modern phonology, quite sensibly in our opinion, is seeking its own "cognitive identity" instead of being tacked onto the existing cognitive paradigm.

[5] A good example of such a futile linguistic, "theory-limited", pursuit is the attempt to tame English word stress system presented by Chomsky and Halle (1968: 240). Their Main Stress Rule, although consistent with the SPE-internal rule formalism (which was, in principle, cognitively unlikely, anyway), was more of a formal conjuring trick than a description (let alone explanation!) of a

> "Phonetic variables must be correlated with *something* [emphasis original]. Logically, they are not established prior to investigations of phonological systems. To illustrate, imagine studying the articulation of segments if the atomic hypothesis […] were true. If not infinite, the number of phonetic (articulatory and/or acoustic) criteria that one could utilize to describe segments is extremely large and diverse. One could group sounds according to the total energy involved in their production, according to the number of different muscles involved in their articulation, their length in milliseconds, the distance an articulator moves from some predefined neutral position, and so on." (Kaye 1989: 27).

This *something* with which to correlate phonetic description is the phonological behaviour of particular segments. Phonological segments are not atomic and unanalysable. They have their internal structure (be it bundles of distinctive features (Generative Phonology) or combinations of "elements" (Government Phonology). Even such apparently fundamental concepts as vowel (characterised by resonance) and consonant (characterised by an obstruction of the air stream) are defined with reference to a common phonetic property, which contradicts the idea of unanalysibility (Kaye, 1989: 20). He further observes that for an average phonological inventory consisting of 33 segments the chances of finding two (or more) phonological phenomena which are sensitive to the presence of certain (phonetic) types of segments are approximately 1 to 8.6 billion. If the atomic hypothesis is pursued, given the statistical (un)likelihood of one bifurcation within the segmental inventory of a particular language, the existence of the following phonological phenomena in English –all of which are sensitive to vowel-consonant bifurcation– seem completely accidental.

| | | |
|---|---|---|
| (1) | the distribution of clear [l] | [l]ip, be[l]y, app[l]y |
| | the definite article | th[i] apple, th[i] other |
| | the indefinite article . | a[n] apple, a[n] orange |
| | aspiration of /p, t, k/ | [p$^{h}$]ity, [k$^{h}$]at, [t$^{h}$]ime |

In fact, they are all related to the presence of a following vowel. One may, of course, argue that universally valid generalisations cannot be drawn on facts peculiar to one language. Fortunately, more convincing, cross-linguistic evidence for phonologically-based groupings of segments is by no means scarce. Let us consider some

prosodic phenomenon. It was not until the 70's that a more successful (non-linear) analysis of stress appeared (Liberman and Prince 1977), which gave rise to "metrical phonology".

examples from English and Arabic. In (2a) below we present the pronunciation of the definite article in Arabic, in (2b) the distribution of consonant plus /j/ clusters in New York and London dialects and in (2c) the super-heavy (V:C) rhymes in English (The examples in (2a, b) after Kaye 1989: 19; the examples in (2c) after Harris 1994: 76).

(2) a. Arabic definite article

| | | | |
|---|---|---|---|
| ad dars | "the lesson" | al bab | "the father" |
| ar ruzz | "the rice" | al firaash | "the bed" |
| az zubda | 'the butter" | al kitaab | "the book" |
| as sayyaaara | "the car" | al yassar | "the left" |
| at turb | "the land" | al miftaah | "the key" |
| an naas | "the people" | al qamar | "the moon" |

b. the distribution of [j]

| New York | London |
|---|---|
| [t]une | [tj]une |
| [d]ew | [dj]une |
| [s]ue | [sj]ue |
| re[z]ume | re[zj]ume |
| [n]ew | [nj]ew |

c. super-heavy rhymes in English (bold type)

| | | | |
|---|---|---|---|
| angel | [r**eɪn**dʒ] | field | [f**i:l**d] |
| child | [tʃ**aɪl**d] | grind | [gr**aɪn**d] |
| pastry | [p**eɪs**tri] | past | [p**ɑ:s**t] |

In all three sets of examples the phonological processes are sensitive to the presence of coronal consonants, whose articulation involves the raising of the tip and the blade of the tongue towards the top of the oral cavity. Why the same class of segments is relevant for such different phonological phenomena in languages that are not related is completely accidental in phonetic terms but absolutely fundamental for cognitively oriented phonology. Apparently, birds of a (similar phonological) feather flock (phonetically) together. These, and other similar examples, whose detailed presentation would go beyond the scope of this paper, are available. They all indicate that the phonetic classifications of segmental inventories are neither accidental nor language specific. In

fact, they are observable manifestations of the properties "of our biologically defined linguistic capacity" (Kaye, 1989: 25).

Having briefly outlined the cognitive foundations of the internal organisation of segment inventories, let us now proceed to the other aspect of phonological analysis, i.e. the phonological processes. Two questions regarding phonological processes seem fundamental: (i) to what extent, if at all, are phonological processes phonetically motivated and (ii) what purpose do they serve (if any)?

In an attempt to answer the first question we shall concentrate on one type of argumentation which is especially popular in approaches – Natural Phonology, in particular– that advocate phonetically-driven explanation for phonology, namely the ease of articulation. Logically, as observed by Kaye (1989: 42-58), whose arguments we briefly summarise below, a gradual reduction of articulatory effort should in effect produce –in a broad time perspective– changes that would lead to remarkable convergence in phonological systems of languages. This, however, does not happen. Postulating language-specific scales of articulatory effort or difficulty, given the fact that there are virtually no race- or nation-specific anatomical differences in articulatory organs, appears to be untenable, if not ridiculous. Why should speakers of Polish be able to easily articulate the consonantal cluster in *wzdrgnąć*, which would be a killing blow for most speakers of other languages? What particular phonetic difficulty prevents native speakers of English from including words starting with /ŋ/ in their lexicon, while the speakers of Karanga (a dialect of Shona, which belongs to the Bantu group, spoken in Zimbabwe) consider words like /ŋombe/ "cattle" completely unproblematic and natural (Pongweni, 1989). A final counterargument against the "ease of articulation" assumption comes from Yiddish. Like in German, to which Yiddish is closely related, and many other languages, e.g. Polish, there operates a rule of final obstruent devoicing. The process, as Kaye reports after Weinrich (1958), was historically present in Yiddish as well, only to be lost in some Yiddish dialects later on. In terms of the ease of articulation and the anticipated convergence among languages (especially among the ones that are related) finding two contradictory processes in two related languages can only be compared to discovering a living dinosaur.

The existence of phonological processes, many of which are similar in different languages, is a fact, though. If their driving force is not phonetic, as shown by the inadequacy of the "ease of articulation"

arguments, then it is only logical to resort to phonology and assume that cross-linguistically they serve the same cognitive perception-oriented purpose of parsing or speech signal segmentation (Kaye, 1989: 49-58), whose function is similar to the function of punctuation and spacing in writing. Clearly, word stress systems have demarcative function, i.e. the presence of a stressed syllable is always indicative of the word boundary (cf. final stress in French, penultimate in Polish, initial in Hungarian and Czech). Harmonic processes, in which the whole phonological domain (morpheme or word) is characterised by the same feature, e.g. "nasality" in some American Indian languages or "vowel frontness/backness" in Turkish, perform the same function. A change from nasal to oral articulation or a change in the advancement of vowels in a longer string of segments coincides, therefore, with a domain boundary and contributes to the analysibility of a continuous, often quickly delivered, speech signal.

We have chosen to discuss some of Kaye's ideas to illustrate what we mean by "cognitive" approach in phonology. It turns out that as long as phonetics and phonology are viewed as being distinct in the way they analyse sound systems of human languages, i.e. if, following Kaye, we accept the argument that "phonological processes may be *expressed* in phonetic terms" but they are not "*caused* by phonetic factors" (Kaye 1989: 49), then phonology appears "genetically" cognitive.

## 2. Phonological component in Cognitive Grammar

Ever since its first formulations in late 70's and early 80's (Langacker 1989), cognitive linguistics has made remarkable progress, which gave it a status of one of the most influential –and fairly fashionable– trends in modern language research. While it originates from the studies of semantic structure, its aspirations reach much further and, which is understandable, aim at providing "cognitive solutions" for other components of language. To exclude phonology from such a full-scale linguistic enterprise would be a fatal mistake which could weaken its claims made about the cognitive mechanisms that underlie language faculty as such. It remains to be seen whether its exclusion would be equally detrimental to phonology itself.

It is not our intention to provide a thorough review of the phonological component included in Taylor's seminal *Cognitive Grammar* (Taylor, 2007). The book, however, offers a comprehensive

exposition of cognitive linguistics[6] and we take its arguments to be fairly representative of modern cognitive research. Its genuine advantage lies in setting the phonological component in a broader context of cognitive grammar and in an attempt to seek explanation for phonological phenomena with cognitive tools. Too often, however, as for a book that requires little prior phonological knowledge on the reader's part, as admitted in the preface, and which presents the introduction to Cognitive Grammar, it introduces a certain amount terminological mess, for example by mixing "phonemes" with "segments", and is parasitic on a number of purely phonological theories, like Metrical Phonology with reference to "feet" or Prague School with reference to "schematic nasal [N]" (pages 181-182), which, in our opinion, is highly reminiscent of Trubetzkoy's "archiphoneme". The potential harm to a phonologically naïve reader may be twofold. Firstly, it may create a false impression that nothing important has happened in phonology since Chomsky's SPE (1968) and, secondly, that it was Cognitive Grammar that gave phonological analysis a new momentum by relating it to "broader cognitive context".

The following discussion of Taylor's phonological component, while leaving aside many other interesting phonological observations, concentrates on the three fundamental phonological notions, i.e. the phoneme, the syllable and the foot.

### 2.1. The phoneme, or raising from the dead

It has been quite a while since Jan Baudouin de Courtenay –in 1895– and Henry Sweet –in the 1870s– have independently (as reported by Jones, 1957) recognized the idea of "the phoneme". While being entirely of phonetic nature, the concept was viewed in two ways: psychological and physical. According to de Courtenay's psychological view,

> "a phoneme is a speech sound pictured in one's mind and aimed at in the process of talking. The actual concrete sound (phone) employed in any particular speech-utterance may be the pictured sound or it may be another sound having some affinity to it, its use being conditioned by some feature […] of the phonetic context" (Jones, 1957).

[6] Although it is not free form important omissions, the most conspicuous of which are, for example, Lakoff (1993) or Kaye (1989).

Sweet's physical definition, on the other hand, emphasised the phonetic nature of the phoneme even more strongly and assumed no "psychological" representation for it.

> "[…] a phoneme is a family of uttered sounds […] in a particular language which count as one for practical purposes as if they were one and the same; the use of each member of the family (allophone) is conditioned by the phonetic environment, i.e. no one member ever occurs in the situation appropriate to another"[7] (ibid.).

Much later, in the late 1920s and 30s, the idea was independently taken up by American structuralists, Sapir and Bloomfield in particular, whose views seem to be closer to the psychological concept.

The structuralist approach to the phoneme –contrary to a popular view– was not entirely rejected generative phonology. It is true that the very term was generally avoided and the term "segment" was used instead but the only important difference consists in the fact that structural phonemes were atomic, whereas generative segments were bundles of distinctive features.

While being fully appreciative of structuralist contribution to the description and classification of speech sounds for hundreds of languages, some of which may probably be on the verge of extinction now, and generative pursuits to define phonologically natural phenomena and provide tools for the formal expression of such processes, we have to subscribe to Kaye's observation that in modern phonology "the phoneme is dead" (Kaye, 1989: 154).

It was accused in the late 1970s by Metrical Phonology, which first questioned the linear nature of phonological representations (Liberman and Prince, 1977), sentenced to death in the early 1980s under the influence of Goldsmith's Autosegmental Phonology (Goldsmith, 1976) and finally executed by Government Phonology in the 1990s (Charette, 1991). RIP. In modern phonology, which is non-linear and which offers strong cross-linguistic evidence for multileveled representations, where each level encodes different aspects of a phonological expression, i.e. melodic, temporal, syllabic and prosodic, the phoneme has no role to play. The phoneme is nothing more than a convenient fiction (Kaye, ibid.). The reanimation of the notion may only be justified by *new*

[7] The technical term "complementary distribution" was invented by Morris Swadesh.

evidence which proves its usefulness in explaining phonological phenomena.

Cognitive grammar feels no prejudice against the idea of the phoneme. In fact, it accepts the phoneme with all its theoretical genetic defects. Held hostage by the structural analogy assumption, according to which the same structures are expected at all levels of linguistic description, cognitive grammar resorts to the phoneme only because it fits the theory, and not for its explanatory power. As mentioned in Taylor (1995: 223 and 2007: 92-93), the exclusion of phonology from cognitive grammar "would be counter the spirit of the structural analogy assumption" and "it would seriously threaten the status of the prototype model as a valid alternative". The phoneme, most apparently, seems to suit the –originally semantic– prototype model and is utilized as a "catalyser" that enables the inclusion of phonology into cognitive paradigm.

Strangely enough, it is the physical model that appeals to Cognitive Grammar more, even though the psychologically structured phoneme is certainly more "cognitive" in nature. In fact, Taylor is hesitant as to which approach is truly reminiscent of the prototype model. In his opinion, "the psychological and the structuralist approaches are not necessarily in conflict", and the former one "does provide a starting point for explaining the process of category extension. […] It is quite plausible to maintain that a speaker's mental image of /t/ as a voiceless aspirated alveolar plosive reflects the structural properties of the category in question" (Taylor 1995: 228). Unfortunately, no CT-scanning image has been provided to support the mental "image" speculation.

The postulated analogy between the family of allophones and the family resemblance of semantically posylemous items entails the problem of "centrality" of certain members of a given category. Indeed, among the possible allophonic realisations of the /t/ phoneme there are sounds that have little in common with what may normally be described as /t/, i.e. an alveolar voiceless stop. First of all, it is not clear why the "centrality" assumption should be of any importance to phonological analysis of allophones. If one phonetic realization is designated to be central (basic), all other allophones must be in some way derived from the "central" member of the group. It is argued that centrality "is a function of the relations between categories and of the internal structure of the categories. The central members of the categories are kept

perceptually and cognitively maximally distinct" (Taylor 1995: 227-228). Therefore, the aspiration of /t/ produces a salient perceptual and articulatory contrast with a central member of the neighbouring /d/ category. It remains unclear why such perceptual and articulatory contrast should be established only in relation to neighbouring categories, i.e. the ones belonging to the same natural class, for example. Obviously, in a contrast with an allophone belonging to a different category (phoneme) different phonetic characteristics may be perceptually salient.

Similarly, the "chaining link" between particular allophones, to use cognitive terminology, cannot be established. The glottally reinforced articulation of /t/, i.e. [ʔt], is not the mediate link between the non-glottalised realization of /t/ and the glottal replacement of /t/, i.e. [ʔ].[8] It is rather a situation in which the degree of glottalisation differs non-systematically between two realizations of the same allophone in the same context. And, if the "chaining link" relation is necessary to strengthen the analogy with polysemous categories, it is certainly missing in case of other /t/ allophones, e.g. [$t^n$], [$t^l$] and [$t^h$].

The relation of encroachment of one allophone on the phonetic space[9] of another allophone, again compared with the encroachment of some words on the semantic space of others, has limited explanatory power as well. In certain contexts the realizations of /p, t, k/ do merge into the glottal stop articulation, as in the final positions of *ti**p***, *pi**t***, *ki**c**k*, but it seems to be a sheer accident. Other examples of such "encroachment" occur in the place of articulation of nasals in certain consonantal contexts, e.g. before labiodentals, dentals or velars. The otherwise contrastive nasals /m/ and /n/, for example, are realised as a labiodental nasal [ɱ], e.g. *i**n**fant* and *sy**m**phony*. Because the labiodental nasal is encountered only before /f, v/, it is not clear whose "phonetic space" it may encroach upon.

Clearly, the concepts of "centrality", the "chaining link" and "phonetic encroachment" are not important contributions to phonological theory and have little explanatory power. Most

[8] Taylor writes that "the glottal stop articulation may be seen as the consequence of a lenition process (the elimination of an oral closure) applying after a fortition (glottalisation) has taken place". Again, the reader may be confused as to whether phonology done in the cognitive way requires rule-ordering of the SPE type.

[9] How the "phonetic space" of an allophone is defined remains unclear.

importantly, they are of purely phonetic nature, which fact makes true cognitive generalisations difficult, if possible at all.

Finally, it must be acknowledged that cognitive phonology does express a certain amount of dissatisfaction with traditional binary classifications. Dependency Phonology (Anderson and Ewen, 1987) is mentioned as a viable alternative with its elemental components for vowel quality, for example. The theory postulates four components of vowel quality: |i| for frontness |u| for backness, |a| for openness, and |ə| for centrality.[10] The actual quality of a particular vowel is represented by various mixtures of the components and the dependency relations among them. If these abstract elemental primitives are not prototypical and cognitive in nature, what is? Cognitive phonology, unfortunately does not explore this path but adheres to phonologically archaic, phonetically-grounded analyses in pursuit of discovering compelling analogies with semantic relations. Even if such analogies are found, it is not sure if, or to what extent, they may contribute to our understanding of purely phonological phenomena.

### 2.2. The syllable, or analysing something that isn't there

Cognitive Grammar constructs its vision the syllable on the basis of assumptions that in modern phonology are, at least, outdated. It also seems to virtually ignore two decades of phonological skepticism towards the syllable constituent. Needless to say, that referring, however critically, to past accounts is a necessary step in formulating new analyses. It is also an element of a fundamental "code of good practice" in any research. Cognitive arguments referring to laymen's intuitions concerning the number of syllables in a word or the detection of syllable boundaries are unconvincing as they may as well be merely intuitions about the distribution of onsets and rhymes in a particular word.

The concept of the syllable in Cognitive Grammar is built entirely on the idea of sonority, which is claimed to be a universal scalar hierarchy of segments based on their articulatory-acoustic prominence.[11]

[10] Similar assumptions are also made within Government Phonology.

[11] An alternative complexity-based approach (Harris 1994: 149-292) is not explored in Cognitive Grammar, even though it seems to offer a more "cognitive" insight into syllabic structure since it

The position that a segment occupies on the scale is directly proportional to the voicing of the segment and inversely proportional to the constriction of the vocal tract during its articulation.

The sonority-based modeling of the syllable template, however, is inadequate for a number of reasons: While it –usually correctly– predicts that the number of peaks corresponds to the number of the syllables, it is unable to (i) non-arbitrarily place the syllable boundaries, (ii) impose the branching limits on the syllabic constituents and (iii) account for language specific phonotactic restrictions. A further complication is connected with a fairly naïve intuition, according to which anything that precedes the nucleus must be automatically classified as an onset and anything that follows it must be a coda. Therefore, extremely complex onsets are postulated word-initially even though they are not encountered word-internally and identical consonantal sequences are analysed differently: as complex onsets word-initially as coda-onset clusters word-internally. A few examples of problems that the sonority approach entails are presented in (3) below.

(3) a. /s/ + consonant clusters:
homosyllabic word-initially, i.e. /sk/ = onset in *ski*
hetersosyllabic word-internally, i.e. /s/ is a coda and /k/ is an onset in *Alaska*

b. /drgn/ as in *drgnąć*:
is treated as a well-formed onset, despite synchronically available alternations, e.g. *dryg, podrygiwać* and *drgania*

c. while words like *bandit* are naturally syllabified as [bæn.dit], a segmentally identical sequence *band it* has a branching coda in the first syllable

d. monstrous sequences like /pzmrjawlnʒb/ :
must be considered well-formed syllables, since they conform to sonority sequencing requirements

e. the incorrectness of */V:ŋ/ and the phenomenon traditionally referred to as closed syllable shortening, e.g. ret[eɪ]n~ret[e]ntion, remain unrelated.
In fact, both phenomena follow from a binary limit on the branching of the rhyme constituent.[12] Referring to low-

refers to intrinsic properties of segments without referring to an external segmental hierarchy. It has also proved successful in explaining consonantal weakening (lenition) and vowel reduction.

[12] A detailed discussion is provided by Gussmann (2002).

level schemata and high-level schemata (Taylor, 2007: 294-295) only complicates the picture and has no explanatory value.

f. word initial nasal-obstruent clusters, e.g. /□□/, which respect sonority sequencing are banned word-initially in English but allowed in Polish.

Moreover, a universal syllable template, as one may expect, may only be universal due to the fact that it is universally present in natural languages. Therefore, the syllable template referred to by Taylor (1995: 232) may not be universal. It may not even be considered maximal (note that no branching limits on the onset are postulated in Cognitive Grammar) since there are languages, Polish being a good example, which do allow extremely complex consonantal clusters both word-initially and word-finally. The universally attested (prototypical?) syllable has the CV structure and not …(C)(C)V(:)(C)(C)…

Evidently, the sonority-based model of syllable structure is not capable of deriving a prototypical syllable. The schematic construction of the syllable is overproductive and unconstrained, i.e. wrong schemata underlie wrong concretisations. All things considered, the syllable construction in Cognitive Grammar is too rickety to stand the test of cross-linguistic adequacy.

Finally, and most importantly, the only justification for the theoretical status of the syllable constituent is a discovery of phonological processes that operate on the level of the syllable and are sensitive to the structure of the syllable, not some if its structural components. Stress, for example, is completely insensitive to the structure (or the very presence) of the onset since phonological weight in systems like English is a derivative of the structure of the rhyme. Compensatory lengthening processes or closed syllable shortening, e.g. ret[eɪ]n~ret[e]ntion, clearly disregard the onset structure. Aspiration of plosives in English is in no way connected with the syllable either but merely with stress and the presence of a following vowel. At best, aspiration rule may be sensitive to the branching of the onset and not to the syllable understood as a constituent of phonological structure. It is becoming obvious for modern phonology that phonological process disregard the syllable as a constituent.

While the phoneme is dead, the syllable is terminally ill. Its phonological functions are being passed on to the onset and the rhyme.

## 2.3. The foot

In Taylor's exposition of phonological component in Cognitive Grammar relatively little attention is given to the foot. This is indeed surprising since the foot is argued to be among the most readily acquired and recognized phonological structures.[13] In the light of compelling experimental evidence provided by research on stress acquisition, a coherent and cognitively well-grounded proposal concerning the prototypical structure of metrical foot would, in all probability, constitute a major contribution to our understanding of prosodic phenomena.

The experimental study conducted by Archibald (1995), for example, should be appreciated by Cognitive Grammar since it is an example of a truly cognitive quest for a prototypical foot. Since feet may be either trochaic (left-dominant) or iambic (right-dominant), Archibald assumes that children are born with a universal setting for the directionality parameter. His experiments have shown that children have a very strong natural preference for trochaic structure and if "there are input cues that involve length contrasts […], the child will be triggered to set up an iambic stress system".

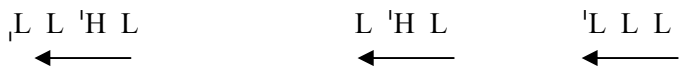
Instead, Cognitive Grammar finds it more interesting, for instance, to speculate whether semantically independent words in English correspond to the foot constituent and whether the foot is a prototypical phonological form of a word.

According to Taylor (2007: 103-104), content words in English have a tendency to coincide with the foot constituent and the presence of stress in English denotes the beginning of a word. This seems to be a statistical manipulation. A large part of English (Anglo-Saxon) lexicon is composed of short forms of 1 to 3 syllables. A well-documented fact is that Old English stress was indeed initial (Stockwell and Minkova, 2001: 168: Dresher and Lahiri, 2003). In fact, most of the contemporary "irregularity" of the English stress system results from the historical tension between the original Germanic stress and the later Latinate pattern. This is shown in (4) below. Main stresses are indicated by bold type; H and L stand for "Heavy" and "Light" syllables (or rhymes, to be precise).

[13] For example, the 5th Workshop on Phonological Development, held in March 2006 in Postdam (for details see: http://www.ling.uni-potsdam.de/~darcy/) was almost entirely devoted to the acquisition of metrical structure, foot preferences, etc. in various languages.

(4) a. Germanic: stress the stem initial syllable, regardless of quantity, building secondary stress from left to right.


b. Latin: stress the penult if heavy, otherwise on the antepenult, secondary stresses from right to left




It turns out that the two competing stress systems produce an identical (initial) pattern only if the syllable composition of the stem is LLL, or shorter. In longer items, especially of classical origin –not to mention morphologically complex formations– the main stress is placed on the leftmost rhyme of the final foot of the domain, i.e. they follow the Latinate pattern.

If the same procedure, i.e. deriving the foot template on the basis of an arbitrarily selected part of the lexicon, e.g. bi-syllabic words, is applied to Polish, one could possibly come to the conclusion that Polish stress is initial. Stress in Polish does signal the word boundary, but it is the end of the word (penultimate syllable) and not the beginning. English is no different in this respect. By virtue of being computed from right to left and being weight-sensitive at the same time, the main stress (isolated exceptions notwithstanding) falls within the "stress window" of the last three syllables. Cutler's statistical research (Cutler, 1990), to which Taylor refers, according to which polysyllabic English words have a tendency to begin with a strong syllable most probably makes no distinction between the main stress and secondary stress(es).

While it seems reasonable, especially in the light of stress acquisition facts, to explore the prototypical status of metrical feet, there is no evidence –at least in English, on which language Culter's arguments are based– that a prototypical foot coincides with a semantically independent word.[14]

[14] A further problem is that this analysis is unable to explain the phenomenon of stress shift in some morphologically complex forms, e.g. ***form*** – ***for****mal* – *for****ma****lity*, since the foot {**ma**lity} in the last

## *Conclusion*

There is nothing wrong about revitalizing old phonological concepts in Cognitive Grammar. Such linguistic enterprise is sensible, though, only in the light of new evidence that was not available to past analyses. In this respect, Cognitive Grammar seems to have nothing to offer. Instead, while relying on traditional phonological terminology, it concentrates on the search for a "perfect analogy" with semantic phenomena, which is perhaps as futile as the generative attempts to analyse semantic categories with binary features and generative rules.

If the structural analogy assumption is to be adhered to, then, one would expect that different components of phonological structures –be it phonemes/segments, syllables/onset rhyme sequences or feet– will display similar structural properties. Unfortunately, in cognitive approach the phoneme/segment, is viewed either as an atomic entity or a group of related allophones, in which case no internal dependency relations –so characteristic for the internal structure of the syllable and the foot– may be postulated. With respect to the syllable structure, cognitivists seem rely on assumptions that have not stood the test of time and have been convincingly rejected in the 1980s. Finally, the importance of metrical structure is underestimated, even though the foot constituent has been shown to have a tremendous importance in language acquisition.

While modern phonology is impatiently looking forward to a thorough cognitive verification of its various theoretical proposals that are being currently advanced, it is rather unlikely, for the moment, that Cognitive Grammar programme is able to truly contribute J. our understanding of phonology.

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form coincides neither with the beginning of the word (nor even with the beginning of the stem, for that matter) nor is it semantically independent.

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**Iwona Góralczyk**

# The infinitival complement clause scene from a Cognitive Grammar Perspective

## 1. Introduction

This paper is an attempt to look at certain phenomena involved in infinitival complementation in both English and Polish through the prism of the theory of Cognitive Grammar as proposed by Ronald Langacker (1987,1990,1991). In particular, our aim is to account for the conceptual processing reflected in the choice of the syntactic pattern in (1a) and not in (1b,c), in the examples below:

(1) (a) *Chciałbym pójść dzisiaj do kina*.
'I would like to go to the cinema tonight.'

(b) **Chciałbym, żebym poszedł dzisiaj do kina.*
Lit'.*I would like so that I go-Subj. to the cinema tonight.'

(c) **Chciałbym, że pójdę dzisiaj do kina.*
Lit. '*I would like that I will go to the cinema tonight.'

We shall start with a bit of history, however. Complementation, and in particular the infinitival construction, has attracted a lot of attention in linguistic research. [1] The literature engendered in the area reflects a multitude of perspectives and a plurality of theoretical angles from which analyses of infinitival complement clauses have been pursued. The earliest linguistic descriptions concentrated on grammatical and logical constituency. They were followed by generative grammatical

explorations in the successive stages of the evolving model, proposed and propagated by Noam Chomsky, starting in 1957 and 1965, and up to its latest version – the Minimalist Program in 1995 and 2000 (cf. Section 2). Parallel to the only-syntactic approach to language semantic investigations of complement forms were also conducted, though limited and outnumbered by generativist research (cf. Section 3). The 1980s and 90s added functional – typological and, finally, cognitive linguistic viewpoints (cf. Sections 4 and 5, respectively). Needless to say, the present paper cannot do justice to all of the extensive treatment of complement clauses referred to above. A selection offered in Sections 2, 3 and 4 can be thought of as background and the spotlight, so to speak, is directed onto what appears to be a most promising tool in the investigation of complementation issues, that is on Cognitive Grammar. An overview of some of its basic tenets will first be offered, with an emphasis on those aspects of Ronald Langacker's model which contribute most to our understanding of the conceptual processing involved in the choice of the infinitive as the complement type (cf. Section 5.1.) In addition, we shall enlarge on Langacker's (1991) and Achard's (1998) analyses of complementation, and the infinitive in particular ( cf. Sections 5.2. and 5.3. ). Finally, we shall look into the lexical semantics of certain predicates compatible with the infinitive, seeking a schematic characterization of the category they form (cf. Section 5.4.). The cognitive mechanisms uncovered in the present analysis will be summarized in Conclusions.

## 2. Only-syntactic explorations into complementation

Even a rudimentary presentation of the generative grammatical stance on infinitival complementation is not, we believe, possible without an in-depth treatment of some complicated, theory – internal details. Our aim, then, will be to illustrate the spirit only.

### 2.1. Early generative – transformational analyses

We shall start with Rosenbaum's (1967) classic publication. Characteristically for the Standard Theory (ST, Chomsky 1965), Rosenbaum posits underlying structures, which are an input to transformations deriving complex surface forms. The infinitival complement is treated as a subtype of verb phrase complementation, de-

rived through an application and expansion of such Phrase Rules as in (2):

(2) $VP \longrightarrow V(NP)(PP) \left\{ \begin{matrix} S \\ PP \end{matrix} \right\}$

Transformations operate on fully-fledged constituents, are strictly ordered, and apply in cycles, either optionally or obligatorily. The choice of the complement type, as well as the choice of the complementizer (*that, to* or-*ing*) is left with the predicate alone and is handled in terms of the verb's syntactic co – occurrence restrictions, with no reference whatsoever to the semantic interpretation of the complement scene, or to the semantics of the verb, either.

### 2.2. Extraction out of complement clauses

Seeking a precise formulation of the rules governing the mechanisms allowing or disallowing extraction out of clauses has become one of the leitmotifs in the successive models of the generative paradigm. Since Ross's (1967) publication the degree of resistance to extraction has been referred to as the degree of i s l a n d h o o d of a syntactic structure. It has been noticed that complement clauses in English in general exhibit a lower degree of islandhood than adjuncts. Compare (3 and 4) (cf. Lasnik 1999: 44):

(3 ) * *Why$_i$ do you wonder [whether [John read the book $t_i$]]?*

(4 ) *?? What$_i$ do you wonder [whether [John read $t_i$]]?*

Within complement types, however, extraction out of tensed clauses is much more heavily constrained than that out of infinitival complements. Compare (5) and (6) (cf. Lasnik 1999):

(5) *?? Who did Angleton believe the claim that Philby suspected?*
(6) *What did Philby suspect Angleton was led to believe?*

Nor is extraction out of infinitival complements entirely free from islandhood restrictions, cf. Shir (1977), quoted in Kalisz (1981):

(7 ) **Who was it instructive for her to emulate?*

Extraction facts from Polish allow for similar observations to be made about complement clauses, yet tensed *że/'that'* complements reveal more resistance to the operation of extraction than English *that* clauses (c.f. Kalisz 1981). Research on wh-extraction, in turn, confirms that, unlike in tensed complements, extraction in the infinitive applies either freely or is much less constrained in Polish as well (cf. Kardela 1986). It remains to be added that since the Extended Standard Theory (EST, Chomsky 1970, 1973) the degree of islandhood is measured in terms of ***Subjacency***, that is – leaving aside theory - internal definitions – in syntactic terms, relating to the (im)possible syntactic distance between the extracted element and its extraction site.

## 2.3. Control and Raising

The interface between the syntax and semantics of complement clauses is brought to the fore in the problem of control. What can well be regarded as a trademark of generative grammar in the area of infinitival complementation, the control problem can be formulated as follows: given that the NPs in bold below are structurally the subject and the object of the main clause, how can we account for the co-reference relationship between these and the **'**understood'/logical subjects of the infinitival complement? Compare (8a,b ):

(8) (a) *M a r y tried to read.*
(b) *John asked M a r y to leave.*

The earliest, ST model suggested that an E q u i - N P D e l e t i o n transformation is in operation in the derivation of (8a,b). Equi was assumed to delete lexical constituents under identity, so that (8a,b) are generated from, roughly, the structures (9a,b):

(9)(a) Mary tried Mary to read
(b) John asked Mary Mary to leave

Subsequent models rejected Equi on the grounds that by referring to semantic information it violates the A u t o n o m y o f S y n t a x T h e s i s (cf. Jackendoff 1972) and introduces too drastic changes into linguistic structure.

Alternatively, the Raising transformation has been suggested, which moves NPs that are base generated in the subject position of the embedded clause up to their surface structure position in the fashion marked in (10):

(10)[$_S$[$_{NP}$ e] seems [$_S$[$_{NP}$ Mary] to have solved the problem]]
[$_S$[$_{NP}$ Mary] seems [$_S$[$_{NP}$ ti] to have solved the problem]]

Let us only note at this juncture that as early as in the seventies Raising inspired syntactic investigations offering other than transformational-generative solutions, most notably in the work of Postal (1974). As our main interest is in the semantic approach, however, we shall not enlarge on his analyses here.

In conclusion to this section, let us just notice that the question of what motivates the speaker to use one complement construction in a particular speech situation rather than any other syntactic pattern their language offers seems to remain unanswered. In the light of the above, what is clearly needed is a usage-based, or a meaning-based approach. Let us first consider early non-cognitive semantic investigations into complementation.

## 3. Pre- cognitive semantic investigations into complementation

Parallel to generative grammatical research, semantic investigations into complementation have been conducted since the late 1960s. In early research, categories from logic such as ***fact***, ***event*** and truth value assessments were suggested to be useful in the linguistic description of the various complement types. Vendler (1967), for example, distinguishes ***events*** from propositions (or *facts)* on both philosophical and linguistic levels. In his analyses, ***events*** are consistently expressed with either gerundive or infinitival structures, while propositions consistently require finite complement forms.

Kartunnen (1971), in turn, focuses on infinitival forms and presuppositions carried by implicative verbs followed by the infinitive. Implicatives, which make implications about the truth value of their complement proposition, are classified by Kartunnen into groups with respect to the effect these verbs have on the presupposition inheritance from the complement clause to the main clause.

Presupposition is also an important tool in Freed's (1979) study of aspectual complementation. Assuming a communicative view of language, dependent on the interaction of the speaker, the hearer and the context, Freed stresses the important role of the prior knowledge of both the speaker and hearer in determining the acceptability of an utterance (cf. Freed 1979:6). Defined in such way, presuppositions together with consequences, understood as the knowledge gathered by the hearer from the utterance, favor a certain interpretation of the complement scene, as illustrated in the choice of the complement form in (11) (cf. Freed 1979:153):

(11) *I had hardly slept for two nights, but the excitement of the move plus my nervous energy kept me going. By the third day I began to feel / * feeling drugged and every time I sat down I started to fall asleep.*

Of key importance for the present paper are Bolinger's (1968, 1984) investigations, if only for his potentiality vs. reification distinction. This contrast between "something projected" and "something actually done" underlies the choice between, respectively, *to* and–*ing* complements, as in (12a,b):

(12) (a) *John started to get angry.*
(b) *John started getting angry.*

In the context of emotion, the above contrast is extended: in Bolinger's view, the *to* complement is compatible with emotions that are ***projected*** rather than caused in reality. In his own words, the choice of the infinitival complement expresses "an attitude towards an event, not a reaction to it" (cf. Bolinger 1984:52).

## 4. Functional – typological analyses into complementation

Functional – typological research in the 1980s and 1990s brought a marked enrichment to the study of complementation. Its significance for the present research stems also from the fact that there are important similarities and parallelisms between functionalism and cognitive linguistics and the two approaches are often taken to complement each other. Let us briefly survey two major analyses: Givón's (1980,1993) and

Wierzbicka's (1988) semantic-grammatical, in her own words, investigations of complement forms. [2]

### *4.1. Talmy Givón*

His 1980 and 1993 analyses of the foundations of complementation, if not strictly cognitivist in the adopted methodology, show Givón to be a true cognitivist in spirit. In his investigations he is led by the theoretical assumption that the form of the complement follows from the way the subordinate event is c o n s t r u e d by some c o n c e p t u a l i z e r, or, more precisely, from the way the two events become integrated under the conceptualizer's construal to yield a single complex event. In Givón's account, it is the event expressed by the main verb that exercises a controlling role, forming a stronger or less strong s e m a n t i c b o n d with the integrated event. Givón correlates semantic binding and the complement's form into an iconic principle:

> The stronger the semantic bond is between the two events the more extensive will be the syntactic integration of the two propositions into a single clause. (cf. Givón 1993:2).

Note the successively weakening s e m a n t i c grip of the main verb on the complement clause, together with the successively looser s y n t a c t i c integration/greater s y n t a c t i c i n d e p e n d e n c e of the complement clause (cf. Givón 1993:6):

(13) *She let go of the knife.*
(14) *She let him go home.*
(15) *She told him to leave.*
(16) *She 'd like for him to leave.*
(17) *She suggested that he should leave.*
(18) *She knew that he left.*
(19) *She knew: 'He left.'*

In light of the above, the infinitival complement will be characterized as denoting an event which is (relatively) strongly integrated into the semantic frame of the main verb, so that the two events form a (relatively) tight bond. The predicates co-occurring with this type of verbal complementation can be schematically described as denoting events extending a s t r o n g c o n t r o l over the scene of the complement event.

### 4.2. Anna Wierzbicka

Complementation, and in particular *to* clauses, receive an in-depth treatment by Wierzbicka (1988). Within her framework the choice of a complement type is not a syntactic but purely a s e m a n t i c phenomenon. Wierzbicka treats each complement type as a separate c o n s t r u c t i o n, the selection of which is partly independent of the main verb and reflects the way the speaker chooses to view the situation (cf. Wierzbicka 1988:74, 89). In her study, she comes up with detailed formulae in the form of scripts, explicating the semantic make-up of the many subtypes of the main complement types and proposes an invariant for each type. The postulated semantic invariant for the *to* complement comprises a p e r s o n a l, f i r s t - p e r s o n m o d e conveyed in the 'I w a n t', 'I k n o w' 'I t h i n k' and 'a f u t u r e c o m p l e m e n t o f s o m e s o r t' elements in the explications she proposes.

Wierzbicka examines *to* clauses in four semantic contexts: wanting, expressing opinion, with aspectuals and *to* in the context of emotion. She is able to explain the use of the construction with verbs of volition (*want*, *plan, mean*, *intend, propose*, *choose, decide*), verbs of attempting (*try*, *attempt, strive*, *manage*, *fail, endeavor*), speech act verbs (*vow*, *promise, agree, consent, order, ask, beg, implore*), interactional verbs (*force*, *get*, *induce*), and in 'the passive of opinion', e.g.:

(20) *She is thought /believed/said/alleged/reported/ rumored to be dishonest.*

In the context of opinion, Wierzbicka notices that within a set of apparently very similar predicates, *be likely* and *be possible,* one but not the other is available for the Subject–to–Subject Raising construction:

(21) *John is likely to win.*

(22) **John is possible to win.*

Wierzbicka is led here to distinguish between p s y c h o l o g i c a l p r e d i c a t e s, which 'require an individual mind as their point of reference', such as *know, think*, *believe*, *seem*, *appear, be likely*, and l o g i c a l p r e d i c a t e s, which derive their semantic value irrespective of

people's views and refer to some "objective state-of-affairs", such as *true*, *false, (im)possible*, *(im)probable* (cf. Wierzbicka 1988:56, 57). Of the two, only psychological verbs are available for Subject - to - Subject Raising, as in (21), Wierzbicka observes, and she relates their cumulative semantic characterization to the *to* complement via the w a n t i n g component.

Let us, finally, recapitulate Wierzbicka's investigations of *to* complements in the context of emotion, as in (23, 24):

(23) *I blush to think of you.*

(24) *I am pleased to meet you.*

While accepting Bolinger's (1984) distinction between e m o t i o n s c a u s e d and p r o j e c t e d, Wierzbicka contrasts projective emotions based on w a n t i n g and projective emotions based on ***awareness***, respectively illustrated in (25a, b):

(25) (a) *I am eager to see Peter here.*

(b) *I am delighted to see Peter here.*

The respective explications go as follows (cf . Wierzbicka p.99, 103-104):

(26) I am eager to see Peter here. I think this: I want this: I will see Peter here.
It will happen soon.
When I think this, I feel something ('eager').

(27) I am delighted to see Peter here. I think this. I know this now: I see Peter here, this happened to me.
When I think this, I feel something 'delighted'.

Wierzbicka's elucidations of the semantic contexts compatible with the meaning of the *to* clause will be of special value to this paper, with many of her claims repeated and re - cast into Cognitive Grammar's concepts and claims.

## 5. Selected cognitive grammatical analyses of the to complement type

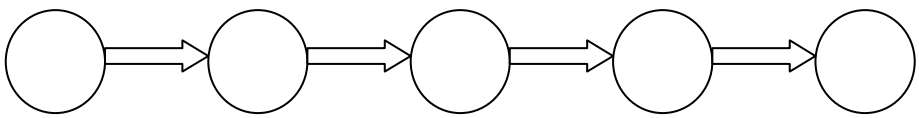
The goal of this section is to present the way the Cognitive Grammar view of language has been implemented in actual analyses of complementation. We first endeavor to elaborate on Langacker's (1991) account, in which complement clauses are contrasted with respect to the degree of semantic elaboration of the subordinate verb (cf. Section 5.2.).The approach to complementation that the present paper ultimately attempts to follow, however, is that of Achard (1998), in which the semantic import of the construction follows from the dynamic mechanisms of construal imposed on the scene of the subordinate event being integrated into the main event (cf. Section 5.3.). We shall start, however, with a very brief overview of the framework's assumptions of pivotal importance to complementation.

### 5.1. Cognitive Grammar: the nature of meaning

The core assumption of Cognitive Grammar is that what underlies the use of language is the process of conceptualization. Meaning is therefore taken to reside not in the outside world, but in human cognitive processing, or interpretation of the outside world. The model can be presented as follows: relative to an expression, certain conceptual content is evoked, provided by a set of cognitive domains activated in the conceptualizing mind. Some domains are basic: they include human conception of time, space, colour, pitch, temperature, pain, emotions, etc. These are fundamental, irreducible and primitive conceptions. Most domains central to the concept's meaning are, however, complex in nature, furnished with folk understanding of certain notions, with more or less conventional and generic knowledge involved, where the aspects of meaning of a concept conveyed by the domain can be more or less intrinsic to this concept and characteristic of it – i.e. more or less informative by way of indentifying the concept unambiguously. Models that are crucial to our understanding of complementation include human understanding of an action chain (cf. the billiard-ball model in Langacker 1991:283), human experience of an observation of an external event (cf. the stage model in Langacker 1991:286) and the combination of these two aspects, which organizes what represents "the normal obser-

vation of a prototypical action" (the canonical event model, Langacker 1991:285)

In particular, the *billiard-ball* model captures the folk model of an interaction. As diagrammed in Fig.1, in folk understanding the organization of the world is such that discrete physical objects with energy loads, marked as circles, come forcefully into contact with one another thus effecting energy transfer from head to tail, noted as double arrows, in an *action chain*.



Head Tail

Fig. 1 The action chain in the billiard-ball model

The relevance of the model to complementation consists in the fact that its elements conceptually underlie grammatical categories of the noun (objects), the verb (energy transfers) and the simple clause (the minimal action chain).

The *stage model*, in turn, captures folk understanding of human perception of events. It involves focusing attention on a specific, clearly delineated region, perceived as organized into a stable setting (SET) and participants in motion. The scene unfolds through time, the interactions of the participants form *events*. Linguistically significant contribution of the model resides also in the notion of a viewer observing the event from an external vantage point (V).

The two models discussed combine to form *the canonical event model*, diagrammed in Fig. 2 below:

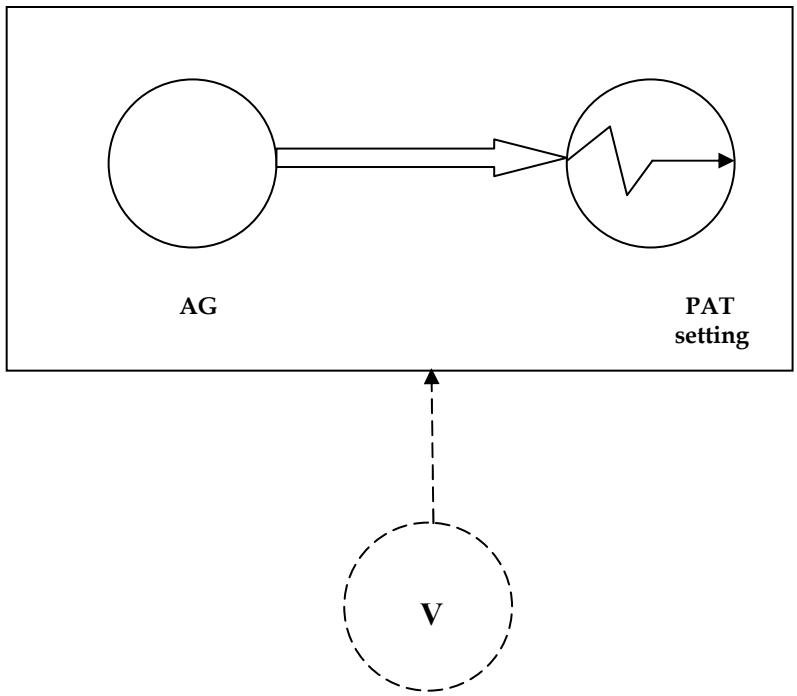



Fig. 2 The canonical event model (Langacker 1991:285)

As shown in the figure, a single event is conceptually understood to occur between an action-chain head, performing the role of an agent (AG), and an action-chain tail, absorbing the energy load and thus bearing the role of a patient (PAT). The patient undergoes an internal change of state, as indicated by the squiggly arrow. The event occurs within a setting and is observed by a viewer (V), note the direction of the dashed arrow.

The knowledge organized as the three models above provides a c o n c e p t u a l b a s e. It constitutes but a part of an expression's meaning, intrinsic and independent of the conceptualizer. Yet in its essence, the meaning of the expression is deeply s u b j e c t i v i s t and i m a g i ***c*** in nature: it is the speaker/conceptualizer who chooses a particular image to shape the conceptual content of an expression in the effort of c o n s t r u a l. A selection of differing linguistic expressions and grammatical constructions reflects different construals of the conceived situation. In relation to complementation, the above amounts to the claim that the separate semantic import of each separate complement

construction comes about precisely due to a specific construal each of the constructions imposes on a conceptual base that is common to them all. The dimension of construal of particular relevance for complement constructions is perspective in its two aspects: vantage point and viewing arrangement. An extended presentation of them will be found preceding their implementation in the analysis in Section 5.3.

The last issue to be discussed in this section concerns the *nature* and *structure* of a *category*, conceptual and linguistic alike. Categories are claimed to form a radical network of 'better' and 'worse' category members clustered around the *prototype*, with fuzzy boundaries and graded membership[3]. That network can be structured through *prototype(s)* and a process of *extension* from prototypes. Alternatively, Langacker (1987) emphasizes the role of a *schema* and the process of *elaboration* or instantiation of a schema. The necessary explanations go as follows (Langacker 1987:371):

> A prototype is a typical instance of a category, and other elements are assimilated to the category on the basis of their perceived resemblance to the prototype; there are degrees of membership based on degrees of similarity. A schema, by contrast, is an abstract characterization that is fully compatible with all the members of the category it defines (so membership is not matter of degree); it is an integrated structure that embodies the commonality of its members, which are conceptions of greater specificity and detail that elaborate the schema in contrasting ways.

We shall repeatedly refer to both prototypical and schematic characterizations of the category formed, as we shall claim, by the predicates co-occurring with the infinitival complement type later in this section

## 5.2. Ronald Langacker's analysis of the semantic elaboration of the verb

In his 1991 global characterizations of complementation, Langacker concentrates on the verbal character of subordinate clausal structures. First and foremost, traditionally regarded as clear - cut, the notion of clausehood is re-examined and in his analysis captured in terms of more prototypical and less prototypical clausal structures. As Langacker insists, drawing an absolute boundary between a clause and a non - clause would prove gratuitous. The gradability of verbal charac-

ter becomes a more tangible concept if the verb is considered through the prism of the layering of the four semantic functions its form can convey. Thus, as the first layer, the verb stem provides information about the conceptual essence of the event encoded by the clause. In Langacker's terminology it represents a process type (T). The second layering consists in making the process type instantiated (I), so that an abstract idea as *czytać* 'read' and not *pisać* 'write', for example, becomes tied to specific participants and a specific time address. An instantiation still needs to be understood quite abstractly, however, as not yet anchored to the speech situation and speech act participants, Langacker argues. The anchoring is not yet complete with the third layering, through which the process becomes quantified (Q). This layer provides information about the internal structure of the process or the figure/ground organization of the conceptual scene, coded grammatically as aspect and voice. Finally, the verb form may indicate that a quantified instance of a process type is grounded (G), i.e. anchored to the ground, which contains the setting and the interlocutors participating in the speech event. Grounding categories such as tense, modality and person markers specify the exact nature of the relation between the event and the ground (cf. Achard 1998:50).

In such an account, a finite clause, which conveys full layering (G(Q(I(T)))), is a prototypical instance of a clause, while the infinitive, which represents a quantified instance of a process type (Q(I(T))), is a less prototypical instance of a clause.

The gist of the distinction between a grounding predication in a finite clause and an ungrounded one, as in the infinitive, consists in the fact that the former but not the latter situates the profiled process with reference to the ground, providing the necessary conditions for the process to be conceived of as fully-fledged, that is sequentially construed.[4] By contrast, the subordinate event encoded as the infinitive is viewed holistically, at a distance. Adopting Langacker's metaphor, we would say that there is no window, separate for this subordinate event, through which the process could be viewed in a close-up fashion. Instead, summary scanning of the event is encouraged.[5]

According to Langacker, the effect of backgrounding is achieved via complementizers. Langacker argues that they impose atemporal or even nominal construal on the clause they introduce: "Each complementizer takes a clause some distance along the path leading from a processual to a nominal profile." (cf. Langacker 1991:440).

Consequently, in his schematic characterizations of the infinitival complement construction, Langacker makes recourse to *to* suspending sequential scanning and deriving a complex atemporal relation that profiles *the* entire path i.e. all the component states of the subordinate process. Reference to future events is taken by Langacker to represent a prototypical value of the construction. Additionally, Langacker accepts Wierzbicka's (1988) explications of the meaning of the construction in terms of *a* personal, subjective, first-person mode.

### 5.3. Michel Achard's view of event integration in complementation

While taking full advantage of the theory of Cognitive Grammar in the version proposed by Langacker (1987, 1991), Achard approaches the syntax and semantics of complementation from the other end, so to speak. In a fully articulated account of French complement forms, he seeks the core of complementation in the conceptual dynamics of event integration (cf. Achard 1998: 29).

In this account, key importance is accorded to the notion of construal, the essence of which is to combine single events to form complex ones according to how the conceptualizer chooses to construe the scene conceptualized. The mechanisms governing the distribution of complement forms after main verbs are tackled by Achard in purely semantic terms. He investigates the semantic import of complement constructions themselves and looks to both the construction and the lexical semantics of the main verb for the motivation of a particular construal of a subordinate event, linking the two in the following fashion:

> (…) I will follow the idea that due to their lexical semantics, certain verbs impose a specific construal on their complement scene and hence motivate a certain construction. Other verbs are more flexible and potentially compatible with several construals. In those cases, the selection is made according to the pragmatics of the speech situation. Achard (1998:8)

Let us now see specifically what parameters of construal are claimed to be of particular utility in Achard's analysis of complementation. Achard claims that perspective, and in particular its two aspects: the vantage point from which the complement scene is conceptualized and the viewing arrangement that holds between the subject and the object of conceptualization directly pertain

to complement constructions. The complex conceptualizing relations involved in such complex events can best be summarized in the following schema of complementation (cf. Achard 1998:65):

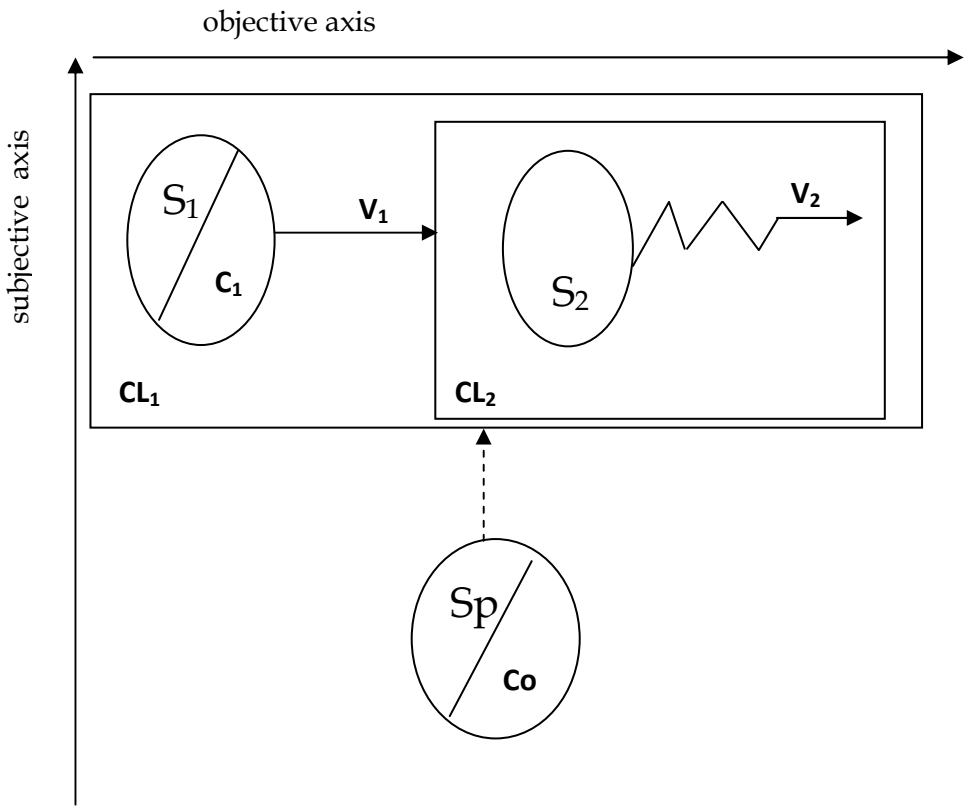



Fig. 3 Conceptual relations in complementation processes

The outer rectangle $CL_1$ in Fig. 3 represents the complex clause, with $V_1$ as its main verb, and the inner rectangle $CL_2$ stands for the complement clause event, with $V_2$ as the subordinate verb. The schema captures two construal relations indicated by the directions of the arrows leading from Sp/Co to $CL_1$ in one case and from $S_1/C_1$ to $CL_2$ in the other.

Before we enlarge on these relations let us emphasize that they are both a l w a y s present in every conceptualization of every complex

event. Complement constructions differ precisely with respect to which of the two relations plays the most relevant role in the conceptualization of the scene of the complement event. Let us first follow the construal relation signaled in the schema as the arrow under $V_1$. Achard claims the relation to be crucial in such conceptualizations in which the main clause subject $S_1$ acts also as the sole relevant conceptualizer (C) with respect to the complement scene $CL_2$ (hence $S_1/C_1$). As indicated by the dashed arrow, the other conceptualizing relation, the one obtaining between the speaker Sp and the conceived scene of the complex event $CL_1$, is left (relatively) inactivated. Such a construal from the vantage point of $S_1$ is prototypical for a conceptualizing subject construction (CSC), and may be syntactically realized as a complex clause with either finite or infinitival complement clause, as in (28):

(28) (a) *Paul croit qu'il comprend*.
'Paul believes that he understands.'

(b) *Paul croit comprendre*.
'Paul believes to understand.'

The semantic import of the construction is captured by Achard as follows: a CSC conveys the main clause subject's ($S_1/C_1$) conceptualization of the event structure delivered by the complement scene, which more precisely means that it expresses how exactly $C_1$ conceptually relates to the event singled out from reality for the complement configuration. The main verb profiles the exact nature of that relation, e.g. it is a belief in (a, b). The speaker Sp merely presents $C_1$ 's relation.

Alternatively, the complement scene may be construed from the vantage point of the speaker Sp, hence Sp/Co. Note the direction of the arrow leading from Sp/Co to $CL_2$. The main clause subject $S_1$ is only afforded a marginal role in the conceptualization of the speech situation. Such construal relations are found by Achard explanatory in modal complement constructions. Achard's considerations of the vantage point in finite, infinitival and modal constructions lead him to the conclusion that "the vantage point from which the complement scene is conceptualized goes a long way towards explaining the syntactic realization of the complement." (Achard 1998:61).

Fig. 3 marks one more aspect of perspective which in Achard's view proves critical for an adequate account of complementation. As schemat-

ically shown in the figure, the complexity of the relations involved can be conveniently thought of as organized along two axes measuring the "conceptual distance" between the viewer, be it $S_1/C_1$ or Sp/Co, and the object of the viewer's conception, be it $CL_2$ or $CL_1$. If the object of conception remains "distant" from the cognizing subject, who "loses all self – awareness" in the activity of conceptualization and the linguistic coding of the event reveals no presence of either the conceptualizing mind or their setting and/or the participating interlocutors, we speak of the *optimal viewing arrangement* (OVA). In contrast, while remaining the observer of the scene, the subject of conceptualization may become part of the scene himself. The asymmetry between the observer and the scene observed is blurred, and this fact is reflected in the linguistic coding of the scene. We speak of the egocentric viewing arrangement (EVA).

Following Achard, we shall assume that the contrast between the OVA and the EVA directly underlies the distinction between finite and infinitival complements. Both complement types represent a *conceptualizing subject construction* (CSC), yet in the first case the scene of the subordinate event is viewed objectively, from the vantage point of the main clause subject. In the second case the complement clause scene $CL_2$ is viewed from within, i.e. from the point of view of the subordinate clause $S_2$. The conceptual distance between $S_1/C_1$ and $S_2$ is reduced and the asymmetry blurred. The semantic import of the infinitival complement construction will thus be stated in terms of a CSC and the EVA configurations.

### 5.4. Some predicates compatible with the construction in Polish

In this section we take a closer look at the lexical semantics of some predicates that co-occur with the infinitival complement type in Polish.[6] We shall not attempt to provide an inventory of all the verbs. Nor shall we deal with the differences between Polish and English in this area. Instead, we shall see how, because of their semantics, certain verbs tend to impose a more subjective construal of the complement scene, in which the asymmetry between the conceptualizing subject and the object of their conceptualization is blurred. We shall consider the notion of initial salience and look for a valid energy source for the infinitival process. The predicates that we investigate form the following set:

(i) interaction verbs: (*na)kazać(ywać*), 'make', *polecić* order, *zakazać*, *zabronić* 'forbid', *pozwalać*, *zezwalać* 'let'

(ii) volition verbs: *chcieć* 'want', *życzyć sobie* 'wish', *planować* 'plan', *zamierzać* 'intend', *myśleć* 'think, intend', *proponować* 'propose', (*z)decydować się* 'decide'

(iii) emotional reaction verbs: *uwielbiać* 'adore', *kochać* 'love', *lubić* 'like', *nienawidzić 'hate'*

To begin with, let us describe in general terms the meaning of the complex clause in which the main event is lexicalized as the interaction (causative) verb, as in (29-31):

(29) *Kazała mu czekać*.
'She ordered him to wait.'

(30) *Pozwól mi tam jechać*.
'Let me go there.'

(31) *Zabraniam Ci się z nim spotykać*!
'I forbid you to meet with him.'

In this construction, to which we shall refer as VOV, the main verb profiles the relation of induction (or prevention of instigation) existing between $S_1$ (the conceptualizing subject) and a situation in the world, coded as $CL_2$. The main clause subject is the primary energy source. It bears responsibility for the complement clause event, exerting control over the logical subject of the infinitive. We can translate it into Achard's construct of a reduced conceptual "distance" between the causer and the causee. The less agentive role of the causee is reflected in its coding as the dative. $S_2$ needs still to be recognized as 'agentive' enough' – it is crucial, in Achard's account, to understand $S_2$'s role in terms of resistance and see it as an initially salient, reluctant source able to generate the infinitival process by itself (non-volitional or inanimate $S_2$ can only be understood metaphorically).

Summing up, for causatives we have suggested an overriding force analysis, with a strong close semantic bond between the main and the subordinate events and the initial salience put on $S_2$ and not the subor-

dinate process itself. The choice of an infinitive – i.e. a much less independent form than the finite complement type – has been shown be a matter of semantic compatibility. Finally, let us note that the subordinate event temporally always follows the main event, we shall refer to this fact as a 'future component'.

Turning now to a wanting relation between the main clause subject $S_1$ and its conceptualization, i.e. the subordinate event, described via a volition verb, it is important to note that the object of the wanting relation does not need to be real. It can be solely the creation of the subject, with no independent, 'objective' existence. We shall claim that this is precisely the essence of the lexical semantics of volition verbs. Due to the semantics of the verb, the subject and the object of conceptualization are very close conceptually. When $S_1/C_1$ and $S_2$ are co-referential (and in Polish they always are), they are so close that $S_2$ and $CL_2$ virtually cannot be construed objectively. $S_2$ is not considered as part of the conceptualized scene, then, but as the vantage point from which the complement clause is viewed. We shall speak of the VV construction. As argued by Achard, if there is no explicit mention of the subordinate subject, person markings on the verb are not needed. The process cannot be grounded, i.e. presented with respect to the speech situation, as person markings are the minimal prerequisite for grounding. The complement is expressed as a quantified instance of a process type.

Emotional reaction verbs are very similar to verbs of volition. They co-occur with the infinitival complement in a VV construction. We shall claim that, because of their semantics, the conceptual distance between $S_1$ and $CL_2$ is reduced. The emotional reaction verbs profile $S_1/C_1$'s reaction to the event captured as $CL_2$. The subject of the emotional reaction verb is close enough, then, for the complement event to trigger the reaction in the subject. Co-referentiality is an additional factor making $S_1$ and $S_2$ very close conceptually. The internal vantage point in the construal of the complement scene is only natural. Unlike with causative verbs and verbs of volition, linking the infinitival complement to the future in the context of emotional reaction is not straightforward. Careful explications, like Wierzbicka's (1988) or Bolinger's (1984), show how the two can be linked. It appears that Achard's methodology falls short of explaining that particular aspect of the complement's meaning.

## 6. Conclusions

The aim of this paper has been to sketch out a Cognitive Grammar based analysis of infinitival complementation phenomena in English and Polish. We first offered a survey of syntactic and early semantic analyses of complement types, then enlarged on some functional-typological investigations of particular relevance for a Cognitive Grammar approach we pursue to develop. We further argued that it is the description of conceptual relations in a complex event that is essential to an adequate treatment of complementation, and that the framework proposed by Langacker (1987, 1991) appears to be a most promising tool for the analysis. Our examination of both the complement clause scene and the set of the infinitival complement taking verbs has been inspired mainly by Achard's (1998) analyses and Givón's (1993) semantic bond theory.
The analysis we have offered allows for the following conclusions to be made:

(i) The infinitival complement clause is a construction the semantic properties of which can be systematically related to construal mechanisms.

(ii) The construal mechanisms in operation the conceptual processing of the complement scene involve perspective, and in particular vantage point and viewing arrangement

(iii) the complex clause with the infinitive is a conceptualizing subject construction (CSC), i.e. the complement event is viewed from the vantage point of the main clause subject. The role of the speaker Sp is limited to merely reporting $S_1$'s conceptualization.

(iv) The subordinate event is typically viewed by the conceptualizer who remains at the reduced conceptual distance from this event under the EVA relation.

(v) The agent of the subordinate event either retains its role as the energy source for the subordinate process in VOV, or is not distinct from the main clause subject in VV constructions. In the first case, $S_2$ is not 'fully agentive', linguistically coded as the dative. In the second case, $S_1$ and $S_2$ are co-referential, and the concep-

tual processing should be understood as construing the scene of the complement event from an inner vantage point of $S_2$=$S_1$.

(vi) The lexical semantics of the predicates which co-occur with the infinitive have been analyzed to exhibit much responsibility towards the scene of the complement event, expressed as a reduced conceptual distance towards the object of $S_1$'s conceptualization. Such will be the s c h e m a t i c characterization of the category the predicates form. Reference to the future has been identified as an important meaning component for causatives and verbs of volition. We shall refer to this quality, then, as p r o t o t y p i c a l for the construction.

Precisely these, purely conceptual/semantic properties of the infinitival construction render it acceptable for the language user in the context of (1a), repeated here as (32):

(32) *Chciałbym pójść dzisiaj do kina.*
'I would like to go to the cinema today.'

**Notes**

1. The present paper is based on the author's doctoral thesis "The Complement Clause Scene. A Cognitive Grammar Account of Indicative THAT-Clauses in Polish and English", to be published (2008), Wydawnictwo Uniwersytetu Marii Curie-Skłodowskiej.
2. Classification after Horie (2000:2)
3. In claiming this, cognitive grammarians follow theoretical considerations of Wittgenstein (1953) and empirical findings of Rosch (1973, 1975, 1977 and 1978) and Labov (1973).
4. Sequential scanning is such a mode of temporal processing of multiple configurations forming an event when a series of configurations are all profiled individually, as unfolding through conceived time. When the event is processed in this mode it is a *process* (a verb in the traditional taxonomy)
5. In opposition to sequential scanning, summary scanning refers to such a mode in which all facets of the scene are co-activated and simultaneously available, the flow of time is not an object of processing.

6. Following Kardela (2000), we shall assume full equivalence between the English and Polish infinitival construction.

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**Joanna Łozińska**

# Acquisition of Locative Expressions in Polish from the Cognitive Perspective

## 1. Introduction

There has been a long-term debate over the question if first language is acquired thanks to innate capacities and structures children are born with or whether language acquisition takes place due to their bodily experience and the experience children gain while interacting with the world surrounding them, including the acquisition of linguistic knowledge. There are a number of differences between languages as far as the conceptualization of space is concerned. Consequently, it is often assumed that the differences in this kind of conceptualization show that linguistic knowledge about space is, to some extent, arbitrary and not inborn. Simultaneously, cross-linguistic similarities in conceptualization will point at inborn, nonlinguistic cognitive processes common to all children speaking various languages.

Although it can be stated without a doubt that the universal concepts are at work in the prelinguistic cognitive development and that they provide basis for language development, the vast amount of cross-linguistic data point to a significant role of the specific language bias. This is evidence which supports the language-specific acquisition hypothesis postulated by Bowerman (1996), which states that the structure of the target language governs the process of early spatial semantic development.

## 2. The purpose of the study

The purpose of the study was to establish the order of emergence of prepositions and the frequency of their production in the early stage of acquisition of Polish. The results of the study constituted a base for a cross-linguistic comparison and accounting for the similarities and differences in the early patterns of language acquisition, as well as the factors influencing the process of learning a language.

To compare the acquisition patterns, I investigated the acquisition of prepositions by two Polish-speaking children aged from the first utterance till they were four and then compared the findings with the results of a similar study carried out on an English-speaking child.

## 3. Method

In the selection of the data I used a corpus representing spontaneous linguistic output of two children, Basia and Jaś. The data come from the Child Language Data Exchange System (CHILDES) and were recorded in Cracow in 1950-1960 as a part of a research project directed by Stefan Szuman (Jagiellonian University). The data were computerized by Magdalena Smoczyńska (1985). The children were recorded every day by their parents, who were graduate students in developmental psychology.

I focused on the period starting from the production of the first utterance till the children were four. All utterances containing prepositions or case markings which profile spatial relations typically marked by prepositions were selected and analyzed.

The data for Basia were collected by her mother every day since the very early word production when she was 1;5.0 (year; month. day) until 2;9.28. The overall corpus consists of 2543 dialogues. The present analysis spans the ages from 1;5 to 4;0. Of the 967 dialogues produced by Basia, 181 comprising spatial terms were selected. The first token of a spatial term appeared at the age 1;8.4, in reference to the ball which fell down:

(1) *CHI: pinta **bu**, pinta **bu** .
%flo: pinta **bu**, pinta **bu** .
'ball down, ball down'
*MAM: piłeczka ci upadła ?
Basia 1;8.4

Transcrips for Jaś cover ages 1;00 to 3;11 with data collected almost every day or several times a day. The corpus of speech data for Jaś is large and contains 1315 dialogues. 541 of them were selected as the ones containing spatial terms. The first token of a spatial expression appeared at age 1;03.24, in reference to books, which had fallen down from the table:

(2) @Situation: Zrzucił książki ze stolika. Krzyczy, potem mówi:
*CHI: **ba**.
'down'
Jaś 1;03.24

**4. Results**

By the age of 1;11 the prepositions are omitted in obligatory contexts, and at this time case inflections indicate the spatial relations, which normally are encoded by prepositions, as in (3):

(3) *CHI: daleko **0do dziadzia, 0do baby 0na spacer** .
%flo: daleto dziadzia, baby paciel .
far grandpa-GEN, grandma-GEN, walk-ACC
"far away, to grandpa, to grandma, for a walk"
Basia 1;9.4

The time when prepositions are omitted is followed by a short period when they are reduced to so called "stopgaps". These are vowel sounds (e.g. *a*), which stand for prepositions (Leikin 1989), as in (4):

(4) ***CHI:** na spacer mamo, na spacer **!**
**%flo:** **a paciel mamo, a paciel !**
'for a walk, for a walk'
Basia 1;11.20

Tables included in the following section show the results of the study: the acquisition order of prepositions and case markings denoting spatial relations by Basia and Jaś (Table 1 and Table 3 respectively) and the frequency of their production (Table 2 and Table 4 ). For the purpose of comparison, I included Table 6 and Table 7 in Appendix, which present the acquisition order of prepositions and the frequency of their production by an English child reported by Sinha et al. (2003).

### 4.1 Basia

The range of spatial terms that were identified from the transcript is relatively wide due to the fact that it includes prepositions, selected prefixes, spatial case markers and direction nouns. The list of all types includes 23 items and their acquisition order is presented in Table 1.

**Table 1: Acquisition order of spatial locatives - Basia**

| Item | Age (year; month. day) |
|---|---|
| *bu* 'down' | 1;8.4 |
| *opa* 'up' | 1;8.6 |
| genitive indicating the use of *do* 'to', 'into' | 1;9.4 |
| accusative indicating the dynamic use of *na* 'on', 'onto' | 1;9.4 |
| locative indicating the static use of *na* 'on' | 1;9.29 |
| prefix *przy-* | 1;10.19 |
| locative indicating the static use of *w* 'in' | 1;10.20 |
| genitive indicating the dynamic use of *z* 'from' | 1;11.5 |
| prefix *po-* | 1;11.12 |
| the dynamic use of the preposition *na* 'onto' | 1;11.20 |
| prefix *prze-* | 1;11.20 |
| the static use of the preposition *na* 'on' | 2;0.1 |
| *do góry* 'up' | 2;0.24 |
| *do* 'to', 'into' | 2;1.18 |

| | |
|---|---|
| *po* 'on', 'on the surface of' | 2;4.7 |
| the dynamic use of the preposition *w* 'to', 'into' | 2;7.5 |
| the static use of the preposition *za* 'behind' | 2;8.10 |
| *z* 'from' | 2;8.28 |
| The dynamic use of the preposition *pod* 'under' | 2;9.24 |
| *u* 'at' | 2;10.21 |
| the static use of the preposition *w* 'in' | 2;11.15 |
| *przez* 'through' | 4;0.28 |
| *obok* 'near' | 4;0.28 |

Basia's earliest comments on space include spatial terms *bu* 'down' and *opa* 'up' and were produced as early as 1;8.4 and 1;8.6. respectively. These two locative particles are also cited by Sinha et al (see 2003:322) as acquired by English learners relatively early – 2,3 (year, month); they are, however, not listed as the first ones by the authors.

What undoubtedly contributed to such an early use of *bu* 'down' and *opa* 'up' was the morphological simplicity of these childish words as well as the child's repeated experience of being picked up and set on her feet, which is proved by such utterances as (5).

(5) *CHI: **opa** 0na ręce .
%flo: opa lęcie .
up to hands-ACC
'up to hands'
Basia 1;10.1

Moreover, the fact that notions *opa* 'up' and *bu* 'down' were acquired first confirms the presumption that the acquisition order of spatial terms is consistent with the child's non-linguistic cognitive development (Bowerman and Choi 2001:478). The studies of infant perception (Bowerman 1996:388) have shown that within the first months of life infants develop the non-linguistic concepts of 'above' and 'below'.

Although Basia used prepositions from the 23rd month onwards, she showed the awareness of spatial relations expressed by prepositions two months sooner. It was done by the productive use of noun cases, which in adult language are accompanied by particular prepositions. The analysis confirms the studies by Bowerman (1996:385) that the learner's early utterances on space concern mainly motion. Thus, the first two cases which she had acquired, namely genitive indicating the

use of *do* 'to', 'into' and accusative indicating the dynamic use of *na* 'on', 'onto', express dynamic relations, as in (6):

(6) *CHI: chodź mamo 0z Basią **0na pole** .
%flo: chodź mamo Basiom pole
come mummy Basia-INSTR field-ACC
'come mummy with Basia onto the field'
Basia 1;10.8

As Table 1 shows, the acquisition order of spatial case markings is the following: (i) genitive indicating the use of *do* 'to', (ii) accusative for *na* 'on', and (iii) genitive for *z* 'from'. Case markings of the prepositions *do* 'to', 'into' and *na* 'on', 'onto' appeared when Basia was 1;9.4 and genitive indicating the use of z 'from' was produced at the age 1;11.5 (see Table 1). The case indicating the dynamic use of the preposition *na* 'on', onto' preceded the static one by almost a month. The case indicating the dynamic use of *w* 'to' did not appear at all, probably due to its relatively low frequency in input speech.

As mentioned earlier, prepositions themselves started to be produced around the 23rd month of life. The acquisition order of the first ones is :*na* 'on', *do* 'to', *w* 'in', *za* 'behind' and *z* 'from'; however, *za* 'from' was used only once during the period of the entire study, which suggests that it was not a part of the child's productive repertoire and that it should not be taken into account.

This acquisition order of prepositions is to a large extent consistent with the acquisition order of cases indicating them. Another similarity which can be noticed in respect to the acquisition of cases is the fact that the static uses of prepositions always follow their dynamic equivalents, as in (7) and (8). Here, the dynamic use of *w* 'in' followed by the accusative appeared more than four months sooner than its static equivalent with the genitive.

(7) *CHI: uciekajcie muchy **w świat**, uciekajcie daleko, daleko !
%flo: uciekajcie muchy w świat, uciekajcie daleko, daleko !
run away flies in world-ACC run away far away
'Run away, flies, to the world, run away far away!'
Basia 2;7.5

(8) *CHI: idzie do miasta pani **w rękawiczkach** .
%flo: idzie do miasta pani w lenkawićkach
going to town-GEN lady in gloves-LOC
'A lady in gloves is going to the town'
Basia 2;11.15

Table 2 shows that the cases and prepositions which are the earliest to be acquired are also the ones most frequently used by the child.

**Table 2: Total frequency of spatial locatives during the period of study -Basia**

| Item | No. of tokens | Percentage |
|---|---|---|
| *do* 'to', 'into' | 74 | 25% |
| genitive indicating the use of *do* 'to', 'into' | 45 | 15% |
| prefix *przy-* | 25 | 9% |
| the static use of the preposition *na* 'on' | 24 | 9% |
| the dynamic use of the preposition *na* 'onto' | 14 | 5% |
| the static use of the preposition *w* 'in' | 15 | 5% |
| accusative indicating the dynamic use of *na* 'on', 'onto' | 15 | 5% |
| *bu* 'down' | 12 | 4% |
| genitive indicating the dynamic use of *z* 'from' | 10 | 3% |
| *opa* 'up' | 9 | 3% |
| *z* 'from' | 9 | 3% |
| prefix *prze-* | 6 | 2% |
| locative indicating the static use of *na* 'on' | 6 | 2% |
| the dynamic use of the preposition *w* 'to', 'into' | 6 | 2% |
| prefix *po-* on', 'all over' | 5 | 2% |
| locative indicating the static use of *w* 'in' | 5 | 2% |
| *po* 'on', 'all over' | 4 | 2% |
| *u* 'at' | 3 | 1% |
| *przez* 'through' | 2 | 1% |

| | | |
|---|---|---|
| *do góry* 'up' | 1 | 0% |
| the static use of the preposition *za* 'behind' | 1 | 0% |
| the dynamic use of the preposition *pod* 'under' | 1 | 0% |
| *obok* 'near' | 1 | 0% |
| Total of all uses | 293 | 100% |

As we can see, the prepositions *do* 'to', *na* 'on', *w* 'in', *z* 'from', and the noun cases indicating them in the early stage of speech production occurred with much higher frequency than the others. As far as the acquisition of *na* 'on' and *w* 'in' is concerned , this finding is consistent with the results of research on the acquisition of prepositions in English (Sinha et al 2003: 323), Italian, Serbo-Croatian and Turkish (Ingram 1989:428). One of the reasons why *na* 'on' and *w* 'in' are acquired fairly early is the fact that these spatial relations are considered to be cognitively basic. Johnston and Slobin (1979 quoted after Ingram 1989:427) predicted a definite acquisition order of spatial expressions if cognitive development were the only factor to determining the process of language acquisition. As for the static spatial locatives, 'in' and 'on' were predicted to be the first types to be acquired by young learners regardless of linguistic community.

The most frequently used term *do* 'to', 'into' as well as the preposition *z* 'from' denote dynamic relations which are canonically connected with movement to and out of a container. Thus, they may also have developed on the basis of the most early maturing concept of containment (Piaget and Inhelder 1956). However, the fact that in Polish movement towards a three-dimensional container is coded by the preposition *do* 'to', 'into', which highlights the goal of movement rather than the containment can contribute to the development of the child's sensitivity to the goal. In English the dynamic sense of the preposition *in* highlights containment, which may have the influence on the different perception of objectively the same spatial situation. This would support Bowerman's language-specific acquisition hypothesis (1996), which postulates that the process and early content of early spatial semantics is governed by the structure of the target language.

Finally, the use of the rare prepositions such as *za* 'behind', *pod* 'under' and *obok* 'near', was unstable and they were dropped in

subsequent utterances, which may suggest that their use was unproductive and formulaic, as in (9):

(9) *CHI: oo widzisz mamo <kręci się **koło za kołem**> .
%flo: oo widziś mamo: Klęci sie koło zia kołem
see mother-VOC: spins wheel behind wheel-INST
"Look, mother a wheel is spinning behind a wheel"
Basia 2;8.10

Note also that spatial terms such as *z przodu* 'in front of', *z tyłu* 'in back of' were not produced even once during the period of the study. According to Johnson (1979 quoted after Ingram 1989:429) spatial relations denoted by 'front' and 'back' are cognitively complex. Their productive use requires mastering the concepts of proximity (spatial relation between two objects) and object feature (conceiving an object as having front and back). The deictic use of these terms creates even more difficulty (Ingram 1989:429).

**4.2 Jaś**

During the studied period of four years Jaś has developed a vast repertoire of spatial terms. Table 3 presents the whole range of spatial expressions in their order of appearance. The first ones include, first of all, invented, childish words referring to motion along vertical axis, case markings predicating spatial relations and finally prepositions.

The first six utterances were selected owing to the use of a spatial marker in them. They include the words *ba* 'down' and *bam* 'down', which do not exist in the adult language. They predicate, similarly to the first spatial markers used by Basia, downward motion. The words *ba* 'down' and *bam* 'down' appeared at age 1;03.24 and 1;6.4 respectively. Contrary to Basia, Jaś did not invent any word predicating motion upwards. Nevertheless, the early emergence of *ba* 'down' and *bam* 'down' may be a linguistic reflection of an early maturing concept of movement along a vertical axis. Dialogue 10 depicts the way *bam* 'down' was used in Jaś' speech. What is worth mentioning is the fact that in the utterance only downward motion is specified without mentioning the trajector or the landmark of the relation.

(10) @Situation: Jaś zrzuca trawę, którą pozbierał i porozkładał na ławce.
*CHI: **ba** .
%flo: ba .
'down'
Jaś 1;7.3

Genitive which marks the use of *do* 'to', 'into' and the preposition *do* 'to', 'into' itself were the next items in the spatial language acquisition. They were uttered when Jaś was 1;7.25 and 1;9.15 respectively. The early onset of these terms confirms the child's sensitivity to motion. Since the major sense of the reposition *do* 'to', 'into' highlights the goal of movement, we may conclude that the attentional goal bias is reflected in the early mastery of these marks. Since the child does not tend to pay so much attention to the source of the path, the genitive indicating the use of the preposition *z* 'from' was produced three months later, and the preposition *z* 'from' itself four months later. Dialogue (11) is a typical example of the use of *do* 'to', 'into' recorded in the transcripts for Jaś.

%sit: babcia daje Jasiowi łyżeczkę śmietany .
*CHI: **do kieliszka** .
%flo: do keiśka .
to glass-GEN
'to the glass'
Jaś 1;9.26

The influence of a goal bias on the linguistic competence is reflected in the acquisition order of the next case markings: the accusative predicating the dynamic relation of movement towards an entity conceptualized a two-dimensional surface (1;9.22) and the locative specifying the static relation with a surface (1;9.23). Yet, the time span between the onsets of these case markings is relatively short. Besides, the acquisition of case markings denoting relations with a surface is a sign of the early development of the SUPPORT schema, reported by Piaget and Inhelder (1956). The dynamic use of the preposition *na* 'on', 'onto' also appeared sooner than its static equivalent at ages 1;10.14 and 1;11.16 respectively. In Dialogue (12) one may see the dynamic use of the preposition *na* 'on', 'onto' recorded in Jaś' speech data.

(12) *BAB: gdzie ty wychodzisz ?
*CHI: **do łóżka, na drabinę** .
%flo: do łóźka, na dabinę .
to bed-GEN on ladder-ACC
'to the bed, on the ladder'
Jaś 1;10.14

The acquisition of the prefix *-przy* at age 1;10.2, once again supports the hypothesis that the child's attentional bias is at work staring from the very beginning of conceptual development. The prefixes, whose role is to mark the source of the path, *-wy*, *-po* and *–od* , appeared a few months later.

Taking into consideration the fact that the preposition *u* 'at' codes a static relation, we may state that it showed up relatively early, at age 1;10.18. However, children pay much attention to people, who attract it by moving, taking and fulfilling children's desires. This may explain the early emergence of the preposition *u* 'at', which mainly introduces names of people, usually conceptualized as their dwelling places. To illustrate, let me quote Dialogue (13) taken from Jaś' transcripts:

(13) *MAM: gdzie byłeś z babcią rano ?
*CHI: **0u Cioci Wandzi** .
at aunt Wandzia-LOC
'at aunt Wandzia's'
Jaś 1;11.11

The rest of the spatial terms appeared in the second year of Jaś' life. The first two are: the accusative indicating the dynamic use of the preposition *pod* 'under' (2;0.19), the dynamic use of *nad* 'over' (2;2.14), which again point to the goal bias. They appeared in such utterances as the one included in Dialogue (14):

(14) *BAB: gdzie poszedł kotek ?
*CHI: do łóżka kocik, **0pod pierzynkę** .
%flo: do łóźka kocik, piezinkę .
to bed-GEN, under covers-ACC
'to the bed, under the covers'
Jaś 2;0.19

The last two spatial markers that were acquired in the first four years of Jaś' life are the static uses of *pod* 'under' and *po* 'on', 'all over'.

**Table 3. Acquisition order of spatial locatives - Jaś**

| Item | Age (year; month. Day) |
|---|---|
| *ba* 'down' | 1;03.24 |
| *bam* 'down' | 1;6.4 |
| genitive indicating the use of *do* 'to', 'into' | 1;7.25 |
| prefix *po-* | 1;8.30 |
| *do* 'to', 'into' | 1;9.15 |
| accusative indicating the dynamic use of *na* 'on', 'onto' | 1;9.22 |
| locative indicating the static use of *na* 'on' | 1;9.23 |
| prefix *przy-* | 1;10.2 |
| genitive indicating the use of *z* 'from' | 1;10.4 |
| locative indicating the static use of *w* 'in' | 1;10.6 |
| the static use of the preposition *w* 'in' | 1;10.11 |
| the dynamic use of the preposition *na* 'onto' | 1;10.14 |
| *do góry* 'up' | 1;10.18 |
| *u* 'at' | 1;10.18 |
| *z* 'from' | 1;11.12 |
| the static use of the preposition *na* 'on' | 1;11.16 |
| prefix *wy-* | 2;0.1 |
| the accusative indicating the dynamic use of *pod* 'under' | 2;0.19 |
| prefix *od-* | 2;1.23 |
| prefix *w-* | 2;2.10 |
| the dynamic use of he preposition *nad* 'over' | 2;2.14 |
| prefix *prze-* | 2;4.20 |
| instrumental indicating the static use of *za* 'behind' | 2;6.21 |
| *po* 'on', 'all over' | 2;8.3 |
| *pod* 'under' | 2;10.1 |

As Table 4 shows, the most frequent spatial term of all produced by Jaś was the preposition *do* 'to', 'into'. Together with genitive, which

indicates its use in the very early stages of speech production, it constituted about 49% of all uses of spatial terms in the period of study. For the sake of comparison, the preposition *z* 'from', which marks movement from a source and genitive indicating its use constituted only 18% of the total of spatial tokens.

The next preposition which was frequently used by Jaś was *na* 'on', 'onto'. Its dynamic uses were more frequent than the static ones. The dynamic uses of this preposition and noun cases indicating it constituted 11% while the static sense amounted only to 7%.

The preposition w 'in', 'into' showed a high frequency of use in the speech data recorded for Jaś – 11%. However, it was the only preposition which occurred only in its static sense.

**Table 4. Total frequency of spatial locatives during the period of study - Jaś**

| Item | No. of tokens | Percentage |
|---|---|---|
| *do* 'to', 'into' | 367 | 47 % |
| the dynamic use of the preposition *na* 'onto' | 81 | 10 % |
| the static use of the preposition *w* 'in' | 74 | 9 % |
| the static use of the preposition *na* 'on' | 59 | 7 % |
| prefix *przy-* | 52 | 7 % |
| *z* 'at' | 24 | 3 % |
| prefix *wy-* | 23 | 3 % |
| *z* 'from' | 18 | 2 % |
| locative indicating the static use of *w* 'in' | 16 | 2 % |
| genitive indicating the use of *do* 'to', 'into' | 15 | 2 % |
| *do góry* 'up' | 12 | 2 % |
| *bam* 'down' | 9 | 1 % |
| prefix *po-* | 6 | 1 % |
| *pod'* under' | 6 | 1 % |
| prefix *od-* | 5 | 1 % |
| the dynamic use of he preposition *nad* 'over' | 4 | 1 % |
| the dynamic use of the preposition *pod* 'under' | 3 | 0 % |

| | | |
|---|---|---|
| prefix *w-* | 3 | 0 % |
| prefix *prze-* | 3 | 0 % |
| *ba* 'down' | 2 | 0 % |
| accusative indicating the dynamic use of *na* 'on', 'onto' | 2 | 0 % |
| locative indicating the static use of *na* 'on' | 1 | 0% |
| genitive indicating the use of *z* 'from' | 1 | 0 % |
| instrumental indicating the static use of *za* 'behind' | 1 | 0 % |
| *po* 'on', 'on the surface of' | 1 | 0 % |
| Total of all uses | 788 | 100 % |

### 4.3 The acquisition order of language subsystems for Basia and Jaś

The data presented so far give grounds for some generalizations about linguistic subsystems, which include cases, prefixes and prepositions. The childish words *bu* 'down' and *opa* 'up', which do not exist in adult language were considered separately. Table 5 summarizes the relevant results concerning the acquisition order of linguistic subsystems, the main role of which is expressing spatial relations.

**Table 5: The acquisition order of language subsystems for Basia and Jaś**

| Subsystems expressing spatial information | Basia Age | Jaś Age |
|---|---|---|
| *bu* 'down' and *opa* 'up' | 1;8 | 1;3.24 |
| Cases | 1;9 | 1;7.25 |
| Prefixes | 1;10 | 1;8.30 |
| Prepositions | 1;11 | 1;9.15 |

As we can see, simplified, childish forms *bu* 'down' and *opa* 'up', which at the beginning replace direction nouns *góra* and *dół* ('mountain' and 'ditch') were acquired first. Let us recall that the reason for this is probably their cognitive and linguistic simplicity as well as the child's repeated experience of being picked up and set on her feet.

The next ones in the acquisition order are noun cases, the use of which indicates the awareness of spatial relations, which in the input speech are expressed in interaction with prepositions. This may have

been caused by their low level of abstractness and the fact that open-class elements are acquired well before closed-class ones.

Verbal prefixes are the third subsystem to be acquired. Although the in-depth analysis of prefixes is beyond the scope of the present study due to their complexity and a large number of meanings, let me compare the acquisition patterns of the prefixes *przy-* and *po-*, which emerge as the first ones. Taking into consideration the fact that *przy-* codes the telic relation of entering an entity conceptualized as a container and *po-* the relation of leaving such an entity, the earlier emergence of *przy-* and its significantly higher frequency reveal the child's conceptual goal bias, which is reflected in the linguistic tendency to mark the goal of movement rather than its source.

As one can see in Table 5, prefixes outpace the production of prepositions in Basia's speech by a month. I assume that this discrepancy is caused by the fact that prefixes are learnt together with the verbs they accompany without being conceived as separate meaningful units. In this way they belong to formulas, which are defined by Dąbrowska (2001:84) as "pairings of phonological form and a semantic representation, learned by rote and retrieved from memory when required". Formulas later on become the basis for generalizing and creating schemas, which "are the blueprints for assembling complex expressions. (…) Schemas are derived from actual expressions and have the same structure as their instantiations" (Dąbrowska 2001:85). All in all, prefixes are acquired before prepositions because at this stage they are just formulas and are retrieved from memory together with the verbs they accompany.

Prepositions constitute the last group in the acquisition order as the most abstract and the most grammaticalized subsystem expressing spatial relations. I presume that they start to be produced after the extraction of schemas, when the child progresses beyond rote-learned phrases.

## 5. Discussion

### *5.1 opa* 'up' and *bu* 'down'

The first spatial terms used by the two children were such words as *opa* 'up' and *bu* 'down' . Their early emergence coincides with the early emergence of *up* and *down* reported for English children. Early

acquisition of spatial terms indicating motion up and down in both languages shows that PATH is the first kind of information that is attended to and conceptualized by infants. The simplest understanding of PATH is, according to Mandler (2005:78), "an image-schema of an object following any trajectory through space, without regard to the characteristics of the object or the details of the trajectory itself".

The concepts of 'up' and 'down' are lexicalized in Polish by means of phrases *do góry* and *na dół*, which encode these relations; however, they are morphologically more complex and were rarely used by the children under study. To illustrate, Basia used *do góry* only once and did not produce *na dół* at all. Instead, such phrases as *na rączki* or *na kolanka* with time took over the meaning of *opa* 'up'. Thus, the UP-DOWN schema was replaced by SUPPORT schema. The use of *opa* 'up' and *bu* 'down' was gradually abandoned. My assumption is that it was after attending to the linguistic input that Basia abandoned the non-existing words. This assumption is in accord with Mandler's perspective on image schemas (Mandler 2005:139). From her developmental perspective on image schemas, she notes that all infants come to the task of language learning with the same preverbal image schemas, but after they attend to their native language, their conceptualization of spatial relations becomes different.

A number of studies report that young infants are more sensitive than adults to the semantic differences which are lexicalized by other languages and are not lexicalized in their native language (Bowerman 1996, Hespos and Spelke 2006). Hespos and Spelke (2006:237) report that infants' sensitivity to these conceptual distinctions declines in the course of development and in the course of acquisition of their native tongue. Language learners limit themselves to the semantic cuts which are marked by the ambient language. This finding is, for example, supported by an experiment (Hespos and Spelke 2006:236) where English-speaking adults in preferential looking and oddity tasks reacted to the in/on distinction and did not discriminate between tight/loose relations, which are not marked in English. Korean speaking adults did the reverse since the in/on relation is not marked in Korean. On the other hand, both Korean and English children were equally sensitive to the in/on and tight/loose categories, regardless of the ambient language.

Infants' attendance to the PATH itself, without focusing on its beginning or end, and without specifying the trajector and landmark, shows up infants' sensitivity to PATH and motion.

### 5.2 Infants' sensitivity to motion

The first case markings and the first prepositions produced by Basia and Jaś code dynamic spatial relations, denoting motion. The use of *w* 'in' is an exception because it is the only preposition which is used in the static sense. I have not found any data which would report what percentage of English prepositions produced in the early stages of language acquisition were used in the dynamic sense. However, one may assume that it was also high since in literature this phenomenon is frequently mentioned. For example, Choi and Bowerman (1991:96) report that the earliest uses of the prepositions, especially of the preposition *in* are primary and almost exclusively for motion. Here lies the major difference between the acquisition of prepositions in Polish and English (cf section on *w* 'in' below). The major similarity, however, is the fact that the first prepositions used by Polish and English children refer to motion.

The linguistic data only confirm the results of psychological research on children's early sensitivity to motion. If an analysis of an event is to take place, what is needed in the first place is attention. The fact that infants attend to moving objects has been confirmed by, for example, Arterberry and Bornstein's (2001) experiment, which has shown that infants as young as three months old can differentiate between biologically correct and incorrect motion, and can recognize the difference between the motion of animals and vehicles.

### 5.3 do 'to', 'into' vs. *z* 'from'

*Do* 'to', 'into' is a preposition marking the direction of movement towards a goal. Therefore, when *do* 'to', 'into' is acquired, the end point of path is highlighted.

The so-called goal asymmetry has been revealed by a number of psychological studies, which report it for both adults and children. People in general more willingly code goal-oriented paths than for example source-oriented ones. Rieger (1996, 1997 after Lakusta and Landau 2005:6) suggests that adults have the tendency to pay more

attention to the endpoint of an event rather than to its starting point and this perceptual asymmetry is reflected in language. The studies carried out by Freeman, Sinha and Stedman (1980 after Lakusta and Landau 2005:6) concerned 3-and 4-year-old children who answered the questions about the goal more easily than the questions about the source, in this way also showing the goal bias. The studies carried out by Fisher et al. (1994 after Lakusta and Landau 2005:6) showed that 3-and 4-year-olds when presented with a transfer event where a ball was moved from a toy elephant to a toy rabbit tended to interpret a novel verb *ziking*, which was to describe the event, as *give* rather than *take*. These findings may be interpreted as supporting the agency bias, in which agents are encoded as sentential subject, but they are also consistent with the attentional bias in favour of Goal Paths.

The assumption that the bias to express goals, rather than sources, is non-linguistic and is brought to the language learning task is additionally supported by the results of another experiment carried out by Zheng and Goldin-Meadow (2002). They report that American and Chinese congenitally deaf children, who have not been exposed to any language model, produced terms describing endpoints more often than sources.

The results of the above experiments provide psychological evidence that children come to the language learning task with a perceptual and attentional goal bias and this bias is reflected in the linguistic pattern of acquisition of spatial terms.

The early acquisition of *do* 'to', 'into' may also be caused by the fact that the concept of Goal appears maturing early. Mandler (2005:142) reports that five-month-old children pay more attention to the goal of a reach than to the direction of the path. Later, in the second half of the first year they interpret movement along a path as goal oriented (Woodward 1998 after Mandler 2005:142). By 9 months they are able to distinguish between someone intentionally grasping and object and someone unintentionally resting a hand on it, in this way also distinguishing between purposeful and non-purposeful action (Woodward 2000 after Mandler 2005:142). Next, 11-month-olds can distinguish a goal-path from a similar sequence of actions without a goal (Woodward and Sommerville 2000 after Mandler 2005:142) .

### *5.4 do* 'to', 'into' vs. *in*

In the Polish data the use of *do* ('to', 'into') is marked by the genitive case very early and what is striking is its high frequency of occurrence in the early stage of language acquisition (cf. Table 2 and Table 4). What is surprising is the fact that *to* in the English data appears much later and is not remarkably more frequent than the rest of the prepositions (cf. Table 7). For example the preposition *in* seems to outpace *to* both in onset and frequency. The next difference between the Polish and English data is that the Polish preposition *w* 'in' (as the only one among the early acquired prepositions) is used mostly in its static sense. This finding seemingly seems to contradict the results of studies which indicate the CONTAINMENT to be the most early maturing conceptual primitive, and the image schema of CONTAINER to be a parade example of a schema perfectly rooted in the bodily experience and in the child's daily experience of the routine actions like pouring liquids into cups etc.

Baillargeon and her colleagues (1995 after Mandler 2005:145) notice that the initial concept of CONTAINER differs from Lakoff's description as consisting of an inside, a boundary or an outside. The infant's concept appears to emphasize going into and going out. Thus, initially containers are dynamic spatial concepts of places into which things disappear and from which they emerge. This would explain the frequent use of the dynamic sense of the preposition *in* in the English data, since in English this preposition may be used more freely for coding dynamic relations, with such verbs as *put*, *go*, *come* (e.g. *She pushed my sister in the water or She put a block in the box*). In Polish the coding of the dynamic relation of going into a container is taken over by the preposition *do* 'to', 'into', functioning in expressions like *kłaśc do pudełka* 'put to box' or *wepchnąć do wody* 'push to water'. According to Cienki (1989:144) in English the dynamic relation of entering a container are *in* or *into* +Acc. (cf 14a), while Polish uses *do* + Gen (cf. (14b)).

(14) *a. to put something in your pocket*
*b. włożyć coś do kieszeni*

The dynamic relation of entering a container is also expressed in Polish by *in* +Acc. Cienki (1989:144) when discussing this structure quotes Sysak-Borońska (1980:52-53), who claims that this type is a peripheral usage and occurs when a trajector is embedded in a landmark

which is solid. When *do* +G is used, the landmark is a loose container. Let us compare the following semantically equivalent English and Polish pairs of sentences (quoted after Cienki 1989:144):

(15) *a. to hammer a nail into wood*
*b. wbić gwóźdź w drzewo* (filled solid)

(16) *a. to put a nail in a box* (container)
*b. włożyć gwóźdź do pudełka*

*Do* 'to', 'into' is more commonly used with empty, loose containers, like in sentences *włożyć gwóźdź do szafki*, *do lodówki*, and not **w szafkę*, * *w lodówkę*, while w +ACC with solid, tight or filled containers like in sentences *włożyć gwóźdź w kieszeń*, *w wodę*. Also Przybylska (2002:205) notes much lower frequency of *w*+ACC in comparison with *w*+LOC in the corpuses that she worked on. For instance, in the corpus, which recorded spoken Polish language *w*+LOC was used over five times more often. The remarkably higher frequency of *w*+LOC in the studied corpuses proves that this form must also have been more frequent in the input language.

Undoubtedly then, the structure *w*+ACC is rather a rare and peripheral one, which is reflected in its acquisition pattern. For example, *w*+ACC was used by Basia for the first time at the age 2;7.5, which is relatively late, and only six times.

The fact that the dynamic relations are cut in a different way in Polish and in English and that the prepositions *in* and *to* in English and *w* 'in' and *do* 'to', 'into' in Polish encode dynamic spatial relations in a different way accounts for the different pattern of acquisition of these prepositions. However, the non-linguistic concepts which are coded by these prepositions are the same, since the same dynamic relations are expressed. Nevertheless, the notion of CONTAINMENT is more salient in English when describing movement to a container, while learners of Polish, when using the preposition *w* 'in', need to pay attention whether the container that is being entered is a loose or a tight one.

### *5.5 w* 'in'

Psychological studies reveal that the concept of containment is maturing very early. Baillargeon and Wang (2002 after Mandler

2005:145) showed that 2 ½-month-old infants already know that if something is to go inside a container, the container must have an opening and that if something is in a container it will move together with it. Hespos and Baillargeon (2001a after Mandler 2005:145) showed that 6-month-olds know that a wide object will not fit a narrow one and that 7 ½-month olds know that a tall object will not disappear in a lower one (Hespos and Baillargeon 2001b after Mandler 2005:145).

However, Dwell (2005:373) argues that it seems unlikely that a child's earliest image schemas related to CONTAINMENT will be pure static relations in timeless space. Such a static notion as Lakoff's CONTAINER that is bounded and separates an interior region from an outside is not a developmental primitive. According to Dwell (2005:374) the earliest image schemas will involve activities and paths.

This would explain a late acquisition of the preposition *w* 'in' , which in Polish is used mainly for encoding static relations and its relatively low frequency of use.

## 6. Conclusions

Although the scope of the study has been narrow and limited to the speech production of two children, a number of generalizations may be made concerning the role of innate capacities and language-specific properties in children's cognitive development.

First of all, the processes of productive spatial language acquisition in Polish and in English are to a large extent similar. Both the Polish-speaking children discussed in the present analysis and English-speaking children reported elswere, were acquiring, in a relatively the same order, simple monosyllabic forms encoding basic spatial relations of vertical motion (*opa* and *bu* vs. *up* and *down*), motion towards a goal (*do* vs. *to*), entering a container (*do* vs. *in*), and support (*na* vs. *on*). The similar order of acquisition of prepositions in both languages as well as the fact that the first prepositions were produced mainly for motion indicate the crucial role of the non-linguistic human capacities in the development of spatial categories.

On the other hand, the language-specific acquisition hypothesis mentioned in the Introduction, which assumes a remarkable influence of the acquired language on the child's semantic structuring of space has been supported by, for example, the differences in the acquisition of *do* 'do', 'into' and *w* 'in' in comparison with the English *to* and *in*. In

various languages the same spatial situations may belong to different spatial semantic categories. Thus, the spatial relation of entering a container is typically lexicalized in Polish by the preposition *do* 'to', 'into' and in English by the preposition *in*. As a consequence, a child acquiring Polish may develop sensitivity to END-OF-PATH, which is highlighted by the preposition *do* 'to', 'into' while a child learning English may become more sensitive to the notion of CONTAINER, which is coded by the preposition *in*.

APPENDIX

**Table 6: Acquisition order of spatial locatives in English**

| Abigail | |
|---|---|
| Item | No. Of tokens |
| in | 2,3 |
| on | 2,3 |
| up | 2,3 |
| down | 2,9 |
| to | 3;3 |
| off | 3;6 |
| out | 3;6 |
| at | 3;6 |

After Sinha, Thornseng, Hayashi and Plunkett. 2003

**Table 7: Total frequency of spatial locatives in English**

| Abigail | |
|---|---|
| item | No. of tokens |
| in | 39 |
| on | 30 |
| up | 14 |
| down | 13 |
| to | 11 |
| at | 8 |
| Out | 5 |
| over | 5 |
| off | 4 |

After Sinha, Thornseng, Hayashi and Plunkett. 2003

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