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**Synaesthesia. A Cognitive Approach**

– abstract of Ph.D. thesis –

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**Key-words:** cognitive semantics, neural synaesthesia, linguistic synaesthesia, metaphor, metonymy, symbol, symbolic relationship, sensation-joint synaesthesia, symbolic synaesthesia, synaesthetic transfer, cross-modal relations

**Summary:**

### **Chapter I: *Introduction***

The first chapter of the thesis presents the research theme and objectives of the study. The main research theme of the thesis is the analysis of idiomatic synaesthesia from the perspective of cognitive semantics. Semantic literature has not been concerned with the systematic research of idiomatic synaesthesia; the semantic analysis of synaesthesia has been considered a research topic of stylistics, therefore researches have been conducted mainly in the field of literary synaesthesia (e. g. Ullmann 1957, P. Dombi 1974). Everyday language is rich in synaesthetic expressions as well; one main objective of the study is that to systematize synaesthetic expressions and to identify their types and subtypes on the basis of a relevant corpus. The classification of linguistic synaesthesias can be made on semantic basis also, this grouping is determined by the different semantic motivations underlying synaesthetic expressions. In addition, the thesis investigates if the panchronistic tendencies observed for literary synaesthesia hold for synaesthesias of everyday language as well. The other main objective of the study is to investigate the semantic basis of the linguistic synaesthesias – a research which started in the conceptual frame of cognitive semantics, but later it departed from it. During investigating the semantic motivation of linguistic synaesthesias has become clear that the definition of synaesthesia integrated in the framework of traditional and cognitive metaphor and metonymy theory cannot explain adequately the formation mechanisms of synaesthetic expressions – these cannot be considered relations based either on similarity or on contiguity. This conclusion led us to seek other processes underlying idiomatic synaesthesias. In this regard perceptual synaesthesia, and the process of symbolization described in the science of religion and in psychology seemed suitable.

The first chapter contains the organization of the thesis as well.

## **Chapter II: *Historical review of synaesthesia research***

The first subchapter (*2.1. Historical review of linguistic synaesthesia research*) of the second chapter points out that synaesthesia definitions differ from each other in respect of one major aspect: they are considered either as metaphoric or/and as metonymic relations.

From the many theories of synaesthesia, the definitions of the following researchers are presented in detail: Zoltán Gombocz (1926), Rózsa Lovas (1944), Stephen Ullmann (1941, 1957), Erzsébet Dombi (1974), Bretones-Callejas (2001a, 2001b, 2006) and Sean Day (1996). Zoltán Gombocz (1926) considers synaesthesia as name-transfer based on similarity, where the link between the members of the synaesthesia is made possible not by conceptual, but by connotative similarity. Rózsa Lovas (1944) thinks that the unity of perception – that is contiguity – gives rise to literary synaesthesia: the poet synthesizes in an arbitrary way the auditive, visual, olfactive, gustative, tactile experiences of the perceived reality; in this view synaesthesia is a syntactic relation.

Stephen Ullmann (1957) regards synaesthesia as a figure of speech being at the border-line of metaphor and metonymy because some synaesthetics are based on metaphoric similarity, and some of them on metonymic contiguity. Ullmann's other important finding is that the movement of synaesthetic transfers conforms to panchronistic tendencies which are the following:

1. synaesthetic transfers move from the lower (e. g. taste) to the more differentiated senses (e. g. sight)
2. touch is the largest source domain of transfers
3. sound is the predominant destination of synaesthetic transfers

Erzsébet Dombi P. (1974) applied a structuralist–formalist approach to synaesthesia, and she delimited it both from metaphor and metonymy considering it as an autonomous figure of speech. Dombi states that synaesthetic transfers are not based on name-transfers. In her view synaesthesia is the syntactic relationship of two or more – semantically incompatible – words related to different sensorial domains (P. Dombi 1974: 15).

Synaesthesia gained more and more interest in the last decades of the 20<sup>th</sup> century mainly in the United Kingdom and in the USA. Neurologists started to be concerned with perceptual–neural synaesthesia, and these researches linked up with the study of synaesthesia as a figure of speech. In these neuro-psychologic works idiomatic synaesthesia is treated as a marginal phenomenon, because the focus is on the description of perceptual–neural synaesthesia. In general, these papers consider idiomatic synaesthesia as a linguistic manifestation of perceptual synaesthesia, the linguistic and the neural phenomenon are not

sharply distinguished from each other (e. g. Day 1996, Bretones Callejas 2001b, 2006).

The overview of synaesthesia research has made clear that the thesis has to treat in detail the relationship of synaesthesia to metaphor and to metonymy, respectively to what degree it is related to neural–perceptual synaesthesia.

The second subchapter of the second chapter points out that the degree of interest toward synaesthesia is strongly linked to the feeling of the given era and to the mainstream psychology school. Research on synaesthesia reached its first peek at the end of the 19<sup>th</sup> and the beginning of the 20<sup>th</sup> century, and coincided with the appearance of psychology as a separate discipline, with the spread of symbolist movement in literature and in general, with the fin-de-siècle feeling. Kevin T. Dann in his book entitled *Bright Colors Falsly Seen* (1998) explains in detail that the estranged and fragmented urban society of France – and in general of entire Europe – at the end of the 19<sup>th</sup> century imbibed any experience that gave them the feeling that after all the world is knit together and that exists some underlying unity. Synaesthesia research was overshadowed by the spread of behaviorism beginning from the 30-40s of the 20<sup>th</sup> century: synaesthesia as a phenomenon which lacks objectively observable signs could not be integrated in the theoretical framework of behaviorism. Synaesthesia gained interest again in the 80s of the 20<sup>th</sup> century and synaesthesia research has become an interdisciplinary study, the works in the field combine psychological and neurological research results.

### **Chapter III: *The neurolinguistic basis of synaesthesia***

The third chapter of the thesis summarizes the results of neural research conducted in the field of perceptual synaesthesia: contains the phenomenology of perceptual–neural synaesthesia, reviews those psychophysical and fMRI experiments which prove the perceptual reality of synaesthesia and presents the theories proposed concerning the *neural* basis of *synaesthesia*. The frequency distribution of the types of neural synaesthesia is noteworthy because it makes clear that the most frequent neural synaesthesia types are those in which synaesthetes see a colour where others do not (e. g. GRAPHEME → COLOUR). This is important because the frequency distribution of linguistic synaesthesia differs fairly from the frequency distribution of the neural one (in the case of linguistic synaesthesia the type related to the tactile sense – which figures at the end of the frequency distribution list of neural synaesthesia types – is very important, while the role of colour is marginal), and this makes doubtful that the theories explaining the neural basis of synaesthesia can explain adequately

linguistic synaesthesia as well.

The third chapter of the thesis also deals with the phenomenon of the so called regular synaesthesia, which can offer an explanation for the neural basis of idiomatic synaesthesia. The conclusion of the subpart is that synaesthetes, children and non-synaesthetic adults as well show non-random associations of qualities belonging to different senses, and these relations are present due to the neural wiring of the human brain and cannot be attributed exclusively to learning.

#### **Chapter IV: *The types of linguistic synaesthesia and the tendencies of synaesthetic transfers***

The fourth chapter presents the types of linguistic synaesthesia and the patterns to which idiomatic synaesthetic transfers tend to conform. The first subchapter describes the linguistic strategies applied in characterizing sensations, and presents the collection criteria of the adjectives forming idiomatic synaesthesias. This section is followed by the classification of the adjectives belonging to the five senses. Researches focusing on synaesthesia generally give a rough classification of the sense domains: they delimitate five or six of them and take into consideration the qualitative adjectives that pertain to these when analyzing synaesthetic transfers. In order to be able to give a more accurate classification of the types and subtypes of idiomatic synaesthesias, this chapter provides a detailed division of sense qualities. The types and subtypes of linguistic synaesthesia have been determined on the basis of the identification of the sensory modalities and submodalities that serve as source and target domains in synaesthetic transfers.

The analysed corpus has been collected from two different sources. A part of synaesthetic expressions (3520) comes from the Hungarian National Corpus (MNSZ, [http://corpus.nytud.hu/mnsz/bevezeto\\_hun.html](http://corpus.nytud.hu/mnsz/bevezeto_hun.html)). In the course of analysing the corpus became clear that many idiomatic synaesthesias present in everyday language do not figure or are underrepresented in the corpus. The reason for this might be that the Hungarian National Corpus contains mainly political writings and texts in the public domain, and in these types of texts synaesthesias occur less frequently. For this reason the corpus was completed with search results of web search engines.

An overview of idiomatic synaesthesia types makes clear that the most frequent target domain is audition (2166), and the least transfers go to the domain of gustation (12). With regard to source domains it can be said that the domains of vision and touch – that is the highest and the lowest sense domains – serve as predominant source domains in synaesthetic transfers (1534, 1302).



The last subchapter of the fourth chapter investigates the possible universal principles in the process of synaesthetic transfer. The laws of synaesthetic transfers proposed by Williams<sup>1</sup> hold on the whole for Hungarian idiomatic synaesthsias as well. One principle observed by Williams is not valid: in the case of Hungarian idiomatic synaesthesias colour names do not modify sound, instead they characterize exclusively olfactive sensations. Ullmann's synaesthetic tendencies have their parallel tendencies in Hungarian ordinary language, but the hierarchical distribution needs reevaluation. The collected data show that linguistic cross-modal transfers do not tend to map lower terms onto higher ones in the sensorial hierarchy, instead, the directionality of synaesthetic mapping is convergent: idiomatic synaesthesias transfer, in a regular fashion, to immaterial domains, which are difficult to conceptualize, namely the domain of audition and that of smell (2687).

### **Chapter V: *The semantic basis of synaesthesia***

The first chapter of the thesis has pointed out that researches consider synaesthesia either as metaphoric or/and as metonymic relations. Therefore, the fifth chapter of the thesis presents on the one hand those theoretical approaches which, applying the cognitive metaphor theory, consider synaesthesia as metaphoric mapping. On the other hand, this section of the thesis analyses whether synaesthesia, according to the main theories, accomplishes the criteria to be considered as a type of metaphor or metonymy.

One conclusion of this chapter is that synaesthesia cannot be integrated in the traditional view of metaphor, which considers metaphoric relations based on similarity: darkness and an auditive quality (for example in the synaesthesia *sötét hang* 'dark voice') cannot be labeled as similar entities in any way. Those researches which investigate linguistic synaesthesia in the framework of cognitive metaphor theory, argue that synaesthesia is metaphor because it has its origins in the perceptual experiences we have as human beings interacting in the world – the similarity criterion is canceled out of the definition of metaphor. Even if this view gets accepted, we encounter difficulties in trying to analyse semantically idiomatic synaesthesia as cognitive metaphor based on the connection of perceptual experiences. The cognitive theory of metaphor can adequately explain those kinds of metaphors, which have a well-structured source domain. The sensations participating in the process of formation synaesthesias generally do not have a well-defined structure, they are so

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<sup>1</sup> 1. Touch words, if they transfer at all, tend to transfer to taste, colour, and sound, 2. Taste words tend to transfer to smell or sound, 3. Smell words do not form synaesthesias, 4. Dimension words may transfer to colour or sound, 5. Colour words tend to transfer to sound, 6. Sound words tend to transfer exclusively to colour.

called Gestalt-free, immaterial sensations. Accordingly, the sense words involved in linguistic intersensorial transfers do not have a well-defined semantic structure. For example, the semantic structure of the word *sötét* 'dark' does not contain a semantic element which could make it suitable to characterize a sound.

The next section of the chapter presents some definitions of synaesthesia which, although still formulated in the mainstream metaphor theory, depart from certain aspects of it. One such view is attributed to Seitz (2002a, 2005), who delimitates synaesthesia from conceptual metaphor, and argues that synaesthetic expressions are so called primary metaphors because they form in a largely intuitive and non-conscious way. The other noteworthy view is that of Marks' (1996), who attributes an important role to language in the formation of synaesthetic expressions and introduces the notion of amodal attribute that is or can be common in different sensorial fields. By this, Marks eliminates the difficulty of not having able to define the synaesthetic mappings by the means of well-structured target and source domains in the theoretical framework of conceptual metaphor. The third presented theory belongs to Shibuya–Nozawa–Kanamaru (2007), and is worth considering because considers a part of synaesthetic transfers based on emotional similarity of the senses.

The fifth chapter also discusses the relation of synaesthesia to metonymy, and its conclusion is that synaesthesia cannot be considered as a metonymic relation because it does not fulfill the fundamental criterion of metonymy – that of being a name-transfer. In the case of the expression *meleg szín* 'warm colour' – which is considered as metonymic synaesthesia – the touch word does not replace the colour name, but it characterizes it. Besides, it is not a satisfactory explanation for metonymic synaesthesias that the mapping is based on the co-occurrence of the senses: it is true that warm colours tend to co-occur with objects or phenomena related to warmth, but the above mentioned idiomatic expression is easily understood by children, who do not have necessarily the possibility to learn the sensory association of the two senses. In addition, the question arises: how can we define those colours which cannot be related to objects or phenomena giving off warmth or coldness (e. g. purple) as warm or cold colours?

The third sub-chapter of the fifth section presents P. Dombi's (1974) synaesthesia definition which states that synaesthesia is neither metaphor, nor metonymy. P. Dombi argues that (literary) synaesthesia is a syntactic relationship of two semantically incompatible sense words related to different sensorial fields. This definition is well-suited to literary synaesthesia, but cannot explain the semantic mechanisms underlying idiomatic synaesthesia, because it applies a stylistic point of view: incompatibility is justified in the case of literary

synaesthesia, because the special way of perception is expressed by a special figure of speech. However, everyday language users do not aim to use unusual figures of speech, instead they use with great naturalness dead figures of speech, which are embedded in common language, and they do not possess the peculiarity of rhetorical devices. Besides, the semantic research of idiomatic synaesthesias has to explain the compatibility of the two words related two different sensorial domains: the question is, how they can they combine in spite of their semantic incompatibility in a way that language users feel their combination neat.

Based on the conclusions drawn in the previous subchapters, the following section of the thesis proposes an alternative semantic framework for explaining the semantic basis of idiomatic synaesthesia. Two different types of synaesthesia are distinguished: 1.) idiomatic synaesthesia based on real perceptual cross-modal relations – modality-joint synaesthesia, and 2.) symbolic idiomatic synaesthesia. The first group contains synaesthetic expressions which express a perceptual experience when one stimulus activates another sensorial field because the brain areas processing the stimuli of the two different sensorial domains are interrelated. In this group belong the SMELL → GUSTATION and GUSTATION → SMELL synaesthesias (e. g. *büdös íz(ü)* ‘stenchy taste’, *édes illat(ú)* ‘sweet fragrance’). The class of synaesthesias based on real perceptual experience includes synaesthesias in which touch words transfer to smell and taste words.

The second type of idiomatic synaesthesia (e. g. *meleg hang* ‘warm voice’) is considered in the thesis as a symbolic relationship of the components. The basis of the symbolic relationship is neither similarity, nor contiguity but equivalency. The notion of symbol is applied in its meaning used in psychology and in the science of religion. In the aforementioned fields symbol is a form of representation which moulds the transcendent or the content of the sub-conscious in a perceptible form and it can be related to the sub-conscious, non-rational, emotive and intuitive; the symbolic process in turn contrasts the rational, logical way of reasoning. The synaesthetic symbolic relation is a natural one, which is not motivated by the similarity or contiguity of things out there in the external world, but is based on the intuition of a relation of correspondence or equivalence. This intuition is based on the functions and relations of the nervous system which fall outside the conceptual system and are mainly inborn. The relation of the members of synaesthetic phrases is a symbolic one: the sensation expressed by one member creates the same feeling in us as the other sensation which is modified by the former one (in the case of the idiomatic synaesthesia *éles hang*

‘sharp voice’: the sensation raised by sharp objects is equivalent with the sensation which is created by an auditive stimuli)

The fifth chapter contains the repository of modality-joint and symbolic synaesthesias.

## **Chapter VI: *Conclusions, suggestions for future research***

The last chapter of the thesis summarizes the key results and conclusions of the research which are the following:

1. The present study provides a detailed typology of idiomatic synaesthesia by dividing the sense domains, and hence the sense words related to them, into submodalities.

2. It states that the universal patterns observed by Ullmann and Williams have to be reviewed in the case of idiomatic synaesthesias in Hungarian language. According to the data, the hierarchical distribution of synaesthetic transfers does not hold for synaesthetic phrases in Hungarian language: sense words tend to transfer convergently, to sensations that are more immaterial and hard to conceptualize – that is to smell and sound.

3. Reviewing the propositions of cognitive metaphor theory, the conclusion of the research is that synaesthesia cannot be considered metaphor, because its member parts are not related due to similarity between them, and the cross-domain mappings cannot be determined. Metonymy definitions are also ill suited to understanding the semantic process underlying synaesthesia: synaesthetic expressions are not based on the contiguity of two concepts belonging to one conceptual domain – on the contrary, two logically incompatible domains (e. g. the visual and the auditive domain) are contracted. Besides, in the forming of synaesthetic expressions name-transfer does not play a role.

4. The thesis offers a novel way of explaining the semantic basis of idiomatic synaesthesia. It distinguishes two types of synaesthesia: 1.) sensation-joint synaesthesia and 2.) symbolic synaesthesia. The first type includes synaesthetic expressions which are motivated by real perceptual experience (e. g. *édés illat* ‘sweet smell’). The second group consists of synaesthesias in which the relation between the two members of the expression is a symbolic one. This alternative semantic framework points out that symbolic synaesthetic association happens in a non-conscious way, the togetherness of the members is rather felt than known: the symbolic relation thus belongs to the realm of intuition rather than to that of rationality. The alternative semantic framework of synaesthesia attracts attention to the fact that not every expression that is considered metaphor within the cognitive metaphor theory is really a metaphor – it seems necessary to reconsider the notion of metaphor, because it has

become a collective noun which contains linguistic phenomena that are formed on the basis of other processes.

5. The thesis refines the proposition according to which synaesthesia is a linguistic expression of inborn associations of brain areas. On the one hand, there have not been studies investigating if sensory modalities co-occurring in verbal synaesthesias are in neural relationship as well. On the other hand, I think that linguistic synaesthesia is not solely motivated by neural phenomena – semantic processes play an important role as well in their formation.

Future research can be divided into two groups according to the research questions and the applicable research methods:

### **I. Semantic research:**

1. It has to be analysed that the alternative semantic model explaining synaesthetic processes is also available for the so called pseudo-synaesthesias in which a sense word describes an abstract notion – a feeling, a characteristic, a relationship – (e. g. *meleg barátság* ‘warm friendship’), that is if these expressions also can be considered based on symbolic relationship.
2. A comparative research of linguistic synaesthesia could provide additional data concerning the refinement and the testing of universal patterns of synaesthetic transfers. This research should have two parts: the first one would investigate language specific and universal synaesthesias, the other one would analyse to what extent are language specific synaesthesias understood (without learning) by speakers of other languages.
3. A theme of future research could be the synaesthesias present in special languages like: for example to what extent are synaesthesias occurrent in advertising copies in the textile and perfume industry similar to or different from idiomatic synaesthesias used in everyday language, and if their understanding mechanisms are governed by the same symbolization ability described in the case of idiomatic synaesthesias.
4. Synaesthesia research in Hungarian language could extend into a diachronic research/analyses.

### **II. Psychological, neurological research:**

1. Psychophysical and behavioral experiments could investigate if there is a real

perceptual relation behind all linguistic synaesthetic expressions (like in the case of BRIGHTNESS → HIGH PITCH in Marks' experiments).

2. Neurological research could contribute to the research of neurological basis of linguistic synaesthesia if they stated that the sensorial fields contracted in linguistic synaesthesias are also cross-wired in the human brain.

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