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SCHEMAS

Structuring Concept Generation with the Help of Metaphor, Analogy and Schematicity

Schemas in Language, Music, and Visual Cognition Conference

Book of Abstracts

University of Niš, Serbia
Faculty of Philosophy
6-7 December 2024

SCHEMAS IN LANGUAGE, MUSIC, AND VISUAL COGNITION

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https://doi.org/10.46630/lmvc.2024

Publishing Operations Editor
Maja D. Stojković, PhD

Scientific Conference

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BOOK OF ABSTRACTS

Niš, 2024

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The Conference organizers gratefully acknowledge the financial support provided by the Science Fund of the Republic of Serbia through the SCHEMAS project (Structuring Concept Generation with the Help of Metaphor, Analogy and Schematicity – Grant No. 7715934). The Conference is organized jointly by the Faculty of Philosophy and the Center for Cognitive Sciences, University of Niš.

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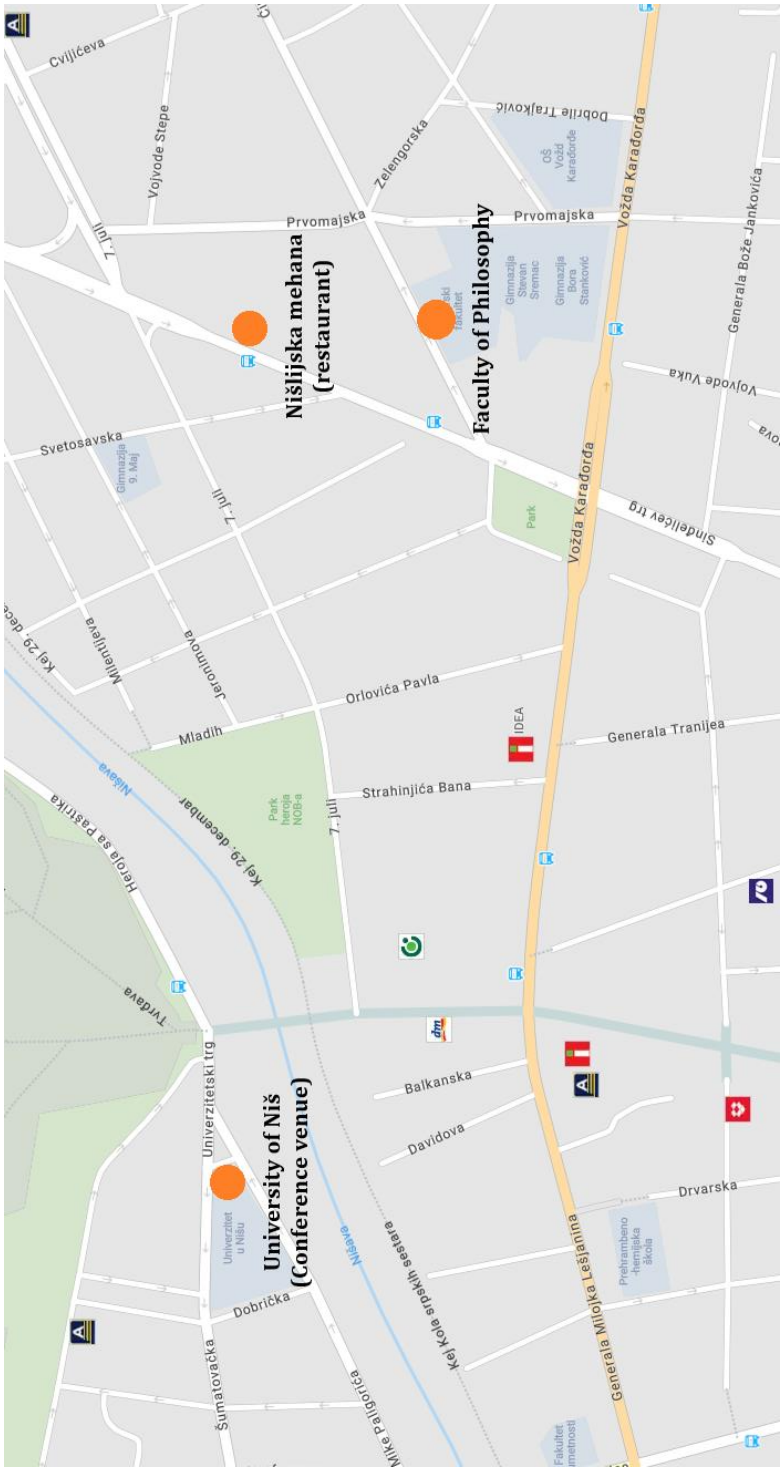

KEYNOTE LECTURES

Beate Hampe (beate.hampe@uni-erfurt.de) /
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MEANING BETWEEN EMBODIMENT AND USAGE: IMAGE SCHEMAS, METAPHORS AND SYMBOL GROUNDING

Five decades after the inauguration of Cognitive Semantics as a research paradigm – and after a massive, multidisciplinary "empirical turn" – Cognitive Semantics is to some extent characterized by a tension between two divergent strands of research, both rooted in the history of the paradigm and placing an emphasis on embodiment and usage, respectively.

Revisiting selected issues from early Cognitive Semantics, notably from image schema theory and the theories of conceptual metaphor and conceptual integration, this talk will (re-)view the central 'classical notions' of image schema transformations, image schema complexes, image-schema hierarchies and the relation of image schemas to primary and complex metaphors from the present-day context of embodied vs. usage-based approaches to meaning.

Apart from discussing (some aspects of) the nature and role of schemas in 'ception' and language, the talk cites multi-modal corpus data to contribute to current discussions of 'symbol grounding' and 'scaling' issues in present-day Cognitive Semantics.

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MUSIC, MORPHOLOGY, MEMORY

When you know a piece of music, what have you stored in long term memory, and in what form? It cannot be stored in an endlessly repeating tape loop. Rather, it must be stored in some static form, which can be "recorded" and "played back." The static representation for a piece of music cannot be just a sequence of notes, or a cloud of exemplars, or a vector in a space over thousands of dimensions, or a derivation generated by "Merge," or a nonredundant skeleton. Rather, it has to include all the notes, their rhythmic organization, and their melodic and harmonic relation to their context.

These considerations bear a strong resemblance to issues in linguistic theory, where the lexicon has to store not just strings of phonemes but highly structured lexical entries and their relationships to each other. Relational Morphology (Jackendoff and Audring 2020) captures these relationships with "relational links," which encode what is the same and what is different in linked items. Relational links turn out to be ideal for encoding motivic similarity in music.

More generally, they help answer questions about the form of musical memory and about the place of prediction in the comprehension of music. However, these parallels between music and language do not argue that music is a form of language or vice versa: this overall organization appears in many disparate domains of knowledge. Neither should we revert to the notion of a single general-purpose system. Each capacity has its own materials.

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SCALAR REASONING IN MACROECONOMICS: THE RHETORICAL ODDITIES OF *EVEN*

Forms of scalar reasoning are endemic to macroeconomic thought and argumentation and, thus, a focus on the linguistics of scales advances understanding of the cognitive models and methods animating different economic paradigms. Taking cues from the work of Gilles Fauconnier, doyen of Cognitive Linguistics, who pioneered early work on pragmatic scales in natural language (1975:374), this talk builds on this early work, pairs it with subsequent treatments of scalar reasoning by Kay (1990) and Israel (2011), and integrates it with his later theory of mental spaces (1994 [1985]) by examining the uses of *even* as an *affirmative*, *concessive*, and *refutative* technique taken from the work of prominent economists writing from the early-twentieth century to the present.

More specifically, this talk reports of uses of *even* in writings on money and political economy in the 1931 debate between Friedrich Hayek and John Maynard Keynes, proceeds to examine the post-Keynesian accounts of "functional finance" over against "sound finance," and finally, recent statements by the Bank of England and other prominent central banks that the Loanable-Funds model, whereby prior bank deposits create loans, is false.

These incommensurate accounts of capitalist economies entail the generation of mental spaces built on pragmatic scales that, following Israel (2011), are sensitive to two semantic properties: quantity (q-value) and informativeness (i-value), where q-values reflect relative positions (high-low) and i-values reflect rhetorical strength (strident-muted). Consistent with Kay (1990), the informative semantics associated with *even* can be mapped on to a valence axis of good←→bad, while quantity semantics can be mapped onto either an easy←→hard and more←→less axis, both of which are opportunistically profiled on a valence axis (e.g., "even harder to believe," "even more egregious").

Rhetorically, the purpose of these scalar mental spaces to highlight recalcitrance of the economist opponent ("even a thousand words of mine … have been water off a duck's back), conceding a premise as preparation for positing an *argumentum ad absurdum* ("even if"), of signaling a fiscal or monetary policy's contradictory goals ("even as"), or in arguing for the continued influence of an economist's theory ("even more relevant today"), among others. The goal of this talk is to highlight the range of mental space configurations used in conceptualizing either how the economy works over against common intuition, or how an economic theory cannot work because it violates common sense.

SESSION PRESENTATIONS

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SCHEMAS IN LINGUISTIC, MUSICAL AND VISUAL CORPORA: DO CONCEPTS FOR MOVEMENT ACROSS THREE MODES REVEAL SIMILARITIES OF UNDERLYING STRUCTURE?

We investigate correlations in the image-schematic structure of manually-annotated corpora in three modes of thought: music (the first ten sonatas by Beethoven), language (the smaller corpus of three books about those sonatas, around 35,000 words, and the larger corpus of political texts from reputable newspapers in Serbian and English, about half a million words) and vision (a series of jocular political cartoons and memes collected online). While we acknowledge the important structural differences among these modalities, we look for instances of five image-schemas motivating conceptual movement across the corpora: FORCE, indicating changes in musical dynamics and referential invocation of power-related terms in the books or interactions in the visuals; PATH, identifying vertical movement in the music and suggestions of upward- or downward motion in the texts and the visual corpus; LINK, suggesting the presence or absence of musical slurs and references to attachment or detachment in the language and the pictures; BALANCE, indicating the loss and regain of consonance in the harmony and invocation of lost and recovered stability in the verbal semantics and the visual presentations; and CONTAINMENT, allocating the nonharmonic tones that "belong" to their resolving notes in the scores and referring to physical or metaphorical enclosed areas in the texts and the images. In a novel analytical proposal in cognitive linguistics, we also ascribe each of the schemas a valence and an intensity (e.g., F+++ indicates a strong positive force, such as a fortissimo in the music or a strong pressure in the language, while F- indicates a weak negative force, a light piano articulation or a relief from pressure denoted in the language or the visuals). Results suggest the following conclusions: musical schemas outnumber linguistic and visual ones; moderate schema strengths are typical of language, music and visuals alike; predominant valences are shared by language and music when the texts are about the abovementioned music, but not when the texts have a different topic; hierarchies of five schemas by strength differ across the modes. Yet the central finding is that the correlations in average densities of each individual schema in music and language, by scalarity and valence, are total, but only when the linguistic output directly describes the musical materials. These correlations are either non-existent or much weaker between the music and the large linguistic or the visual corpus. The implication is that, while schemas operate as semantic building blocks irrespective of the external "symbolical form" in which they are realized, their frequency, scalarity and

valence in the corpora are not a consequence of general statistical tendencies, which might simply tend to stabilize in a very large corpus. Rather, it appears that scalarized image schema complexes perceived in one cognitive mode (e.g., music) may motivate the emergence of a corresponding number of the same complexes in another (e.g., the language about this music), working as primes in the perception process. If this is so, the unconscious inference of schematic structure across the three modes may be taken as an important phenomenon in cognitive science in general.

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AXIAL ORIENTATION IN SERBIAN AND IN FRENCH

Although Serbian and French languages express spatial relationships in formally different ways, a significant similarity is observed between these two languages in expressing axial orientation. The Serbian uses prepositional-case constructions with the genitive (prep+NGen: iznad/ispod/ispred/iza kuće) or adverbial expressions with the genitive (levo/desno od kuće), while the French language uses directional prepositions (Vandeloise 1986) to express orientation in relation to axes. In doing so, both languages conceptualize the object of localization as a point, i.e., they use punctual conceptualization. The Serbian genitive, by its nature, expresses boundaries (između dva čoveka), contrasting with the instrumental case which denotes unboundedness (među ljudima) (Ivić 1957–58), while French directional prepositions contain the preposition À which also expresses punctual conceptualization. Through analysing the ways of expressing orientation in relation to axes in Serbian and French, based on examples from translations of literary works, we aim to point out similarities in the conceptualization in the two languages. The initial hypothesis in the work is that the similarity in the way of conceptualization is a result of similar abstraction mechanisms, whereby the dimensional characteristics of the object are reduced to a point precisely because of the axial orientation. Namely, unlike orientation regarding surface area or volume, where prepositions express dimensional characteristics of an object due to the existence of contact between the located object and the reference object, in orientation regarding axes, there is no contact, and objects are conceptualized as separate entities.

This seems to be in accordance with the existence of WHAT and WHERE system in our cognition, the first one being responsible for the object recognition and the second one for the spatial localization of objects. We use complex geometric notions to name objects and simple notions (such as points and lines) when we locate them in space (Jackendoff & Landau 1992).

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HARMONIC ROUGHNESS VISUALIZED: CROSS-CULTURAL INSIGHTS INTO AUDITORY AND VISUAL PERCEPTION

Visualizing music in two and three-dimensional space has been a central topic in cross-domain studies, blending sound, linguistic metaphors, and visual imagery. This interdisciplinary field leverages the deconstruction of music into intra-musical parameters (pitch height, tempo, loudness, harmonization/mode, timbre, consonance/dissonance) and extra-musical parameters (performance setting, genre, performers' age, gender, and cultural background) to explore how listeners relate these elements to other domains.

This paper focuses on the relationship between the cross-cultural association of auditory roughness, expressed via harmonic dissonance, and visual stimuli varying in symmetry, speed, and balance, among other culturally primed attributes. This line of investigation is particularly relevant within the scope of cross-modal perception, building on studies that examine links between auditory roughness and angular shapes in both two-dimensional and three-dimensional forms (Liew, Styles & Lindborg, 2017; Liew et al., 2018, Giannos et al., 2021).

Consistent patterns, such as the association of harmonic dissonance to surface roughness and of a non-Western harmonization style to symmetry, emerge in participants' responses who originate from different cultural backgrounds (Western, Indonesian). These pairings support the idea of an organizational model of human perception that facilitates the conceptual blend of visual music imagery (Malloch & Trevarthen, 2018; Gritten & King, 2006; Godøy & Leman, 2010) providing an alternative method for associating music with another non-linguistic domain and addressing the problem of meaning construction through the notion of (conceptual) schemata. The role of familiarity and previous exposure to acoustic/harmonic roughness is noted, suggesting that repeated exposure and cognitive/cultural adaptation can influence the evaluation of dissonant stimuli. By exploring the dynamic nature of schemata in cross-modal correspondences and conceptual metaphors within music and visual perception, our study contributes to understanding multimodality, and the comprehension of music through the schema of roughness and visual elements.

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THE MULTI-DIMENSIONAL MAPPING HYPOTHESIS (MMH) OF MUSICAL EXPRESSION

I claim that music is a powerful expressive medium because it has the capacity to show in a detailed, embodied, and dynamic way how particular mental states or episodes feel like to us. I develop my claim with reference to a Multi-Dimensional Mapping Hypothesis (MMH) introduced by Green (2007, and forthcoming), an explanatory model of artistic expression, according to which artists (in our case, composers) express various states of mind by recreating their typical and recognizable phenomenal characteristics in a multi-dimensional space of parameters. The set of parameters includes arousal and valence (after Russell 2003, Benenti 2020) with added dynamicity (Green 2007) but, in principle, the model can handle as many parameters as theoreticians want to. An essential part of this model is the assumed possibility of cross-modal congruence between expressive (musical) stimuli and mental states/episodes, which is spelled out in terms of literal phenomenal similarity between the two (as opposed to merely analogical relation).

In my talk, I would like to discuss two problems related to the MMH which concern the listener's mind: 1. Its lack of resources to account for cognitive penetration and gestalt-shifts, and 2. A consequential incompatibility between tonal and expressive semantics, coming from the atomistic nature of phenomenal experience vs. the schematic nature of tonality – a mismatch that was noticed on a neurophysiological level by Koelsh (2011). I will explore possible theoretical solutions of these problems by reference to Antović's (2022) Multi-Level Grounded Semantics.

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THE ANALYSIS OF MULTIMODAL MUSEUM PRACTICES CENTERED ON SOUND: A CASE STUDY

The twentieth century marked a significant period during which several phenomena paved the way for museums to start exhibiting sound and nurturing a growing interest in its potential. The development of sound recording technologies was a fundamental milestone in this evolution. Additionally, the shift in new museology and museum practice toward focusing on visitors has spurred a greater interest among curators in using sound to enhance museum exhibitions.

Over the past decade, there has been a notable increase in the development of sound-based multimodal museum practices. However, the experiential and representational capabilities of these practices remain largely unexplored. In this paper, I examine the sound art installation The Visitors by Ragnar Kjartansson, utilizing social semiotic methodologies such as the Grammar of Visual Design (Kress 2006[1996]), Social Semiotics of Sound (Van Leuween 1999), Discourse Analysis (Ravelli 2006; 2007), and Spatial Discourse Analysis (Ravelli and McMurtrie 2016). My analysis highlights how mediums such as visuals, text, and, most importantly, sound and space, intertwine to articulate individual subjectivities and a sense of "togetherness." Furthermore, the analysis reveals that in The Visitors, the meaning of the text is apprehended not through reading or interpretation, but through experience. This is particularly significant in the context of contemporary museum practices, which increasingly value and pursue multisensory curatorial approaches. These practices aim to fully embrace museumgoers in the exhibits, allowing them to experience the message of the objects in a profound and enveloping manner.

Overall, this paper aims to advance the development and establishment of sound-based multimodal practices as a cohesive field of research and growing curatorial approach within museums. Additionally, it seeks to encourage a sensory shift from a purely visual epistemology to one that integrates both visual and auditory elements for a richer sensory experience.

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THE SPEAKING BOW: LINGUISTIC RESONANCES IN STRING PLAYING

The concept of 'speaking with the bow' has been a guiding principle in period string performance, akin to rhetorical delivery. While luminaries like Harnoncourt (1982; trans. 1988) and Bernstein (1973) metaphorically explored the intricate relationship between music and speech, the direct aural interplay between musical performance and spoken language remains largely unexamined.

The seminal study by Patel and Daniele (2003) on rhythmic prosody shared between a culture's language and its musical compositions has catalysed two decades of interdisciplinary research exploring the multifaceted relationship between language and music. This extensive body of work provides substantial evidence that a composer's native language influences key musical elements, including rhythm and melody. Additionally, various studies have investigated how these elements impact speech perception, revealing connections that deepen our understanding of their relationship across cultures.

Despite these advancements, a critical gap remains in understanding how a performer's native language influences their musical performance. This research addresses the gap by hypothesizing that the unique acoustic features of a performer's native language fundamentally shape their musical articulation and perception. Building upon Reiter's 'play-the-words' approach (2020), this study introduces a novel methodology for transcribing linguistic acoustic features into nuanced bowing expressions. It aims to capture the 'flavors' of various languages through expressive bowing techniques. For example, my methodology translates Cantonese coda phonetics into distinct bow strokes and reflects the prosody of English and Japanese through strategic downbow placements.

Preliminary sonogram analyses reveal intriguing patterns in note articulation that align with players' native languages, particularly when they 'speak' rather than 'sing' the melody. These findings support the hypothesis that native language influences musical articulation and pave the way for further exploratory investigations and empirical perception studies. This research has practical implications for teaching and performance practices, bridging cultural and linguistic divides in musical expression.

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MEMORISING THROUGH UNDERSTANDING: CONCEPTUAL SIMPLIFICATION AS A TOOL FOR DEVISING SCHEMAS

There is a gap in music performance, education and psychology in terms of memorisation training for post-tonal piano music. Despite the repertoire spanning over 100 years, pedagogues and professionals still lack effective tools for developing this skill. Existing research on this domain is mostly focused on observing practitioners' behaviours during practice, to understand how these prepare for a memorised performance of a selected repertoire. However, a systematic method for effective memorisation is not provided.

This paper discusses a new method for analysis, learning and memorisation of post-tonal piano music, named Conceptual Simplification, which was developed, tested and formalised with my PhD thesis (submitted in 2023). This presents a novel implementation to musical memorisation building on certain areas of mathematics and computer science to improve human memory and musical performance. However, Conceptual Simplification does not require any previous scientific training to be successfully implemented and works for different learning styles and types of complexity. This method could also be adapted to other instrumentalists, singers and conductors; and musical genres; and presents enough flexibility for other practitioners to incorporate additional strategies, adapting it to their needs accordingly. Finally, Conceptual Simplification can also assist in preventing performance anxiety through greater confidence and reducing the potential for injuries that usually result from repeated practice. The method's systematic approach toward engaging conceptual memory and reasoning leads to more confident memorised performances, while needing less repetition during practice.

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REVEALING THE TRACES: PRELIMINARY ANALYSIS OF SCHEMATIC FEATURES WITHIN MULTIMODAL SENSE-MAKING OF DANCE

'Sense-making' is a process of understanding and meaning-making that foregrounds the roles of sensory perception and body-mind integration/interaction. It draws attention to the notion that understanding is a complex, bodily process, rather than a purely abstract one involving only the manipulation of disembodied mental constructs. It recognizes that "[t]he meaning of something is its connections to past, present, and future experiences, actual or possible" (Johnson, 2007, p. 273). Some dance practices are themselves involved in sense-making processes and investigating how people make sense of such practices can provide insights into the nature of embodied meaning-making.

The project 'Revealing the Traces' probes multimodal interview data using an integrated range of analytical tools within an embodied cognition framework in order to unpack sense-making strategies that are evident within contextualized co-speech gestures. The dataset consists of segments from seven, hour-long interviews conducted with participants from the project: 'Feeling the Traces of the Colonial Past' (Radboud University in collaboration with Reframing HERstory Art Foundation). Participants watched a performance and took part in a guided movement workshop, which explored key themes from the performance.

The analytical framework combines a multilevel grounding approach (Antović, 2022) with a model derived from metaphor identification protocols (Cienki, 2017; Fisher, 2023), integrated with gesture analysis methodologies (Müller, 2024). Through this framework I focus on the transformations from the input experiences of observed performance and embodied exploration to the output interpretations and discussions, evident in co-speech gestures. I consider the validity and value of viewing the contextually situated transformations through the lenses of analogies, (conceptual) metaphors, and schematization.

Preliminary analysis indicates that in the service of making sense of dance, gestures can have multiple simultaneous referents and demonstrate schematization that highlights relations between elements. Spatial relationships are used as a proxy for diverse relationship types and dynamic qualities are often foregrounded and exaggerated.

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IMAGE SCHEMAS AS THE ORGANIZING PRINCIPLE OF THE OPERATIC DIRECTION

The paper focuses on image schema(s) (Johnson 1987; Oakley 2007) that can be traced in the direction-scenography concept of an operatic performance within the frame of multimodality of opera performance (Hutcheon & Hutcheon, 2010). I deal with the correspondences between/amongst different modalities (e.g., Spence 2011) of the performance: music, sung text, visual component(s) of scenography, time, space, acting, etc. I analyse what image schemas can be found in the staging concepts of opera production and how these schemas organize the correspondence(s) between different modalities to convey meaning, especially the emotional. In the case study, I analyse examples of contemporary productions of the Baroque lament or lamento aria (Monteverdi, Händel), which I treat as a dramatic situation and a crucial part of concrete opera.

Due to the complex, multimodal nature of opera theatre, I draw on several approaches, i.e., Conceptual Metaphor Theory (e.g., Kövecses 2020), Conceptual Blending Theory (Fauconnier & Turner 2002, Coulson & Oakley 2005), and Multimodal Metaphor Theory (Forceville & Urios-Aparisi 2009). In the music modality, I base my analysis also on the meaning-making process on the works of L. Zbikowski (2008, 2017), P. Pérez Sobrino (2018), and, more recently, M. Antović (2021, 2022). Among the works directly focused on theatrical productions, I use multimodal analysis (Hutcheon & Hutcheon); in the field of opera scenography, I draw partly on (Jindra 1983) and (Havlíčková Kysová 2021, 2022, 2023).

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SCHEMA-BASED TRANSLATION OF IUCN GLOBAL STANDARDS ON NATURE-BASED SOLUTIONS: A DISCOURSE ANALYSIS FROM ENGLISH TO ALBANIAN

This paper investigates the application of schema theory in the discourse analysis of translating the International Union for Conservation of Nature (IUCN) global standards on nature-based solutions (NbS) from English to Albanian. Schema theory, which focuses on the cognitive frameworks individuals use to process information, is crucial for understanding how translators manage the complexities of culturally and technically specific texts. The study examines translation challenges associated with NbS standards, such as technical terminology, cultural nuances, and contextual relevance. Through a detailed qualitative textual and comparative analysis, the research identifies strategies translators use to balance accuracy and cultural appropriateness. Key strategies include domestication, which adapts the text to fit the Albanian cultural context, and foreignization, which retains elements of the source culture while providing explanatory notes or glosses. Additionally, the use of explanatory strategies to bridge cognitive gaps and enhance comprehension is examined.

The findings highlight that schema-aware translation practices significantly enhance the readability and applicability of the translated guidelines. Translators with well-developed schemata in both environmental science and Albanian cultural contexts can more effectively balance accuracy and cultural relevance, ensuring that the translated text is both understandable and pertinent to the target audience. This balance is crucial for maintaining the logical flow and clarity of the source text, making it readable and cohesive in Albanian. By incorporating schema theory into translation methodologies, this paper contributes to improved practices for translating complex, culturally embedded texts. The implications of this research extend beyond NbS standards, offering insights for translating various technical and culturally rich documents. Ultimately, this study supports more effective international environmental communication and implementation, ensuring that global standards are comprehensible and relevant to local contexts, thus facilitating their successful adoption and practice in different cultural settings, such as in Albania.

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READING PAINTINGS: EYE MOVEMENT PATTERNS IN TEXT-INTEGRATED ART

Reading texts that combine text and image is specific because these elements separately elicit different patterns of eye movement. When reading, we start at the top left (Rayner, 1998). When studying art, we look at the centre of the painting or prominent spots (Rosenberg, Klein, 2015). In the 20th century, paintings in which text is part of the picture became widespread (e.g., works by R. Magritte, K. Malevich, E. Bulatov, etc.). The pattern of eye movements when viewing such paintings indicates whether the verbal or non-verbal component is the primary one and whether we can consider these paintings as an example of multimodal text. To answer these questions, an eye-tracking study was conducted with 25 native Russian speakers who had no special artistic or philological training. For the study, 20 paintings by 20th and 21st century artists were selected, 8 of which contained verbal components. The text could be 1) integrated into the artistic image or written on the painting as a separate, independent word; 2) in Russian (i.e., a language known to the recipients) or in French or Spanish (languages unknown to the recipients).

We found no significant difference in viewing time for pictures with text (M=18 s, SD=13) and without text (M=19 s, SD=12), nor in the number of fixations (M=58, SD=38) and saccades (M=57, SD=38). For pictures with integrated text, participants spent on average 55% of their time reading the text. We found a significant effect of the language in which the text was written on dwell time, with shorter dwell times associated with familiar languages that were not integrated. No such effect was found for dwell time in verbal areas. Our results show that such paintings can be considered as multimodal text.

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IMAGE SCHEMA AS AN ELEMENT OF CREATING THE MEANING OF AN INSTRUMENTAL PIECE OF MUSIC

Though they belong to our basic life experiences, and thus appear in extensive literature (Antović, Antović et al., Cienki, Mandler, Oakley, Rohrer), image schemas are not often discussed across all fields. In fact, the knowledge about them is rather modest, almost non-existent in the music community. My goal is to present interpretations of Two Studies for piano by Paweł Szymański (b. 1954), in which image schemas are quite easy to grasp. The overarching research method will be Conceptual Blending Theory with generic space filled with one or two schemas.

The First Study, in the major-minor tonality, is filled with increasingly longer series of identical chords, the first of which is always ff and further ones always mf. The work is divided into eight episodes, the series of which contain 1, 2, 3, 4, 5, 6, 7, 8 identical chords. Each series of identical chords is easily associated with the phenomenon of natural echo. For this reason, two correlated frameworks give rise to an image schema ITERATION (proposed by Johnson, Oakley, Cienki). Within each transition from one episode to another the next series is always one chord longer than the previous one. In such moments, the element connecting the two frameworks is the image schema SCALE (proposed by Johnson). In this situation, the whole work is given meaning – the scaling of musical echo.

The Second Study is a piece of one-voice music, composed alternately of quasi-baroque sections and modernist sections. While listening to the first type of sections, a musical event is correlated with a physical event. What both contributions have in common is a pair of two basic image schemas: +PATH and +GOAL (proposed by Antović). The modernist sections also evoke associations with physical event, but in this case, image schemas are: +PATH and -GOAL, where the minus sign means the absence of this schema (as above). This thought process leads to the conclusion that the study is a quick musical movement in two alternating manners.

In order for the audience to be able to discern image schemas mentioned here, each interpretation will be preceded by listening to a fragment of the work.

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THE PARAPHRASE AS A PERFORMANCE DISCOURSE GENRE: THE CASE OF THE BALINESE VOCAL GENRE "PALAWAKYA"

Paraphrasing is the uttering of discourse which displays a "sameness of meaning between different wordings" (Vila et al. 2011:83). This is vital in the Balinese performance genre called palawakya (Herbst 1997). Palawakya are poetic verses with localized Sanskrit-based poetic meters, with four-line stanzas in predetermined syllable counts. These are in Kawi, the poetic register of Old Javanese (hereafter OJ), a predominant language of cultural dissemination in both Bali and Java (Herbst 1997, Zurbuchen 1987). Since OJ is radically different from contemporary Balinese (Malayo-Sumbawan), paraphrasing becomes essential for any palawakya performance, so much so that it should be considered a distinct performance-centered discourse genre. For this OJ content to be understood by Balinese speakers, the practice of babaosan "reading" involves one participant singing a line of text, then another paraphrasing it in refined Balinese:

(1) Basantatilaka Kekawin Ramayana [https://youtu.be/Z-_DYmz9JOk], accessed 15/12/2019
OJ Verse: Kawit saratsamaya kala nira r para ngka //
by chance autumn time DEF 3.CONJ DEM.PL there
Verse translation: 'It happened to take place in the autumn season.'
Paraphrase (Balinese):
Nemunin sasih katigane, nampih sasih kapate punika.
N-meet-TRNS month ORD-three-DEF N-overlap month ORD-four-DEF that
'It fell on the third lunar month into the fourth.'

As (1) shows, the OJ verse itself may be rather brief; the paraphrase, however, must include all relevant information, for example, saratsamaya 'autumn' being interpreted as the period between the third and fourth lunar months, i.e., October, since 'autumn' does not exist in tropical Bali. Through an examination of various palawakya and their refined Balinese paraphrases, I demonstrate that this paraphrasing exhibits characteristics suggesting that it constitutes its own discourse genre, such as distinct intonational contours, as well as frequent references to either the paraphraser or the audience itself. This practice thus helps bridge the mythic past of OJ text to the world of contemporary Balinese.

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USING ENGLISH LITERATURE TO EXPLORE INTERPERSONAL AND INTRAPERSONAL ISSUES FOR SCHEMA ACTIVATION: A CASE STUDY OF EFL UNIVERSITY UNDERGRADUATES

Schemas form relative to experience, including vicarious (Vygotsky's thought internalization). Engagement with text, both written and oral, is vital to interaction in the EFL classroom and, as hypothesized, to increasing learners' English proficiency. Schema activation in university students seen as a group requires that the themes explored through literary interpretation be within students' personal and/or vicarious experience. The instructor's approach in eliciting personalized responses from students should be unimposing and unobtrusive. This paper presents a case study of interpreting English literary texts to form, activate and potentially change students' schemas regarding specific interpersonal and intrapersonal issues. A selection of contemporary English-language short stories were discussed in an integrated skills class with Year 1 English undergraduates (University of Banja Luka), followed by optional written assignments (digital dialogue journaling or argumentative/persuasive essays). Themes of gender roles and relations, infanticide, self-image, self-presentation and self-actualization featured in the stories were addressed in discussion sessions and through dialoguing. Content analysis of students' journals and essays reveals the extent and depth of schema activation regarding the themes explored. It focused on references to students' self-schemas (personal and vicarious experience), emotional schemas (opinions about the instructor and teaching procedures; participation in public discussion vs. doing written assignments as more discreet and guarded), as well as cultural and gender schemas. The students' texts were also examined for cognitive bias and ideas connected to adaptive behaviour. A survey was conducted to evaluate the linguistic and thematic appropriateness of the themes and texts used (theme interest; students' age and English proficiency), as well as if students' ideas, opinions and attitudes (schemas) had been activated and changed. The paper seeks to answer the question if schema activation and change can occur through vicarious experience (interaction with text) and personal experience (dealings and interaction with the course instructor and fellow students).

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ON INTERACTION OF MUSIC AND LANGUAGE VIA METAPHORS

This research deals with the problem of meaning construction and aims at describing how music is conceptualized through metaphors. The analysis is done following the traditions of the conceptual metaphor theory. The data were collected by hand-search and using language corpora (BNC); the novel 'Grace Notes' written by Bernard MacLaverty is of special interest in terms of language data as its plot is built around the life of a composer. The data were analysed by mapping building to provide characterization of the conceptual elements of music (target) these metaphors highlight, and by using componential analysis.

The results of the analysis show that metaphors of different semantic groups are used to represent music. In its turn each semantic group helps to highlight different characteristics of music as the arrangement of sound to create some combination of form, harmony, melody, rhythm, or otherwise expressive content created by composers. Each component of this definition is expressed by different metaphors.

Thus, music as 'the arrangement of sound to create some combination of form' is expressed by the metaphors of construction building; gem cutting; sculpting; architecture. Music as 'melody' is represented by a number of water metaphors which focus on differences of the movement of sound: flow, shower, flood, ooze, soak. Music as 'harmony' and 'rhythm' is represented metaphorically by 'the sea.' Music's emotional impact on the listener is manifested by the metaphors of sharp tools, light, colour. The metaphor of travelling stands for music having content interesting for the listener. And music as an outcome of the creativity of the composer is depicted by the metaphor of childbirth.

Thus, metaphors depicting music are not employed haphazardly, but represent a system in which each metaphorical element serves to represent a certain characteristic of music.

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FRAME ANALYSIS OF RUSSIAN AND ITALIAN VERBS: A TOOL TO COMPARE TRANSLATIONS

Rather than presenting a mere description of what can sometimes be perceived as isolated categories, frame analysis enables us to study the properties of a concept as a hierarchical structure, which reflects the way a human being processes reality (Minsky). Frames – thanks to their organized, flexible and formulaic structure (Sineleva) – help to create a precise and detailed artificial language, an algorithm which could help to categorize, systemize and formalize the semantics of Russian and Italian verbs. In order to be able to compare the semantics of the verbs (to literally assign a value to the differences and similarities between the verbs), I created a prototype frame for the Russian verb and a prototype frame for the Italian verb. The two frames contain the following slots: Aspect, Voice, Transitivity, Reflexivity, Mood, Tense, Form, Person, Number, Gender, Alteration of the form, Modality, Means of motion, Direction of motion. Graphically, each frame is represented as a table.

The compilation and the comparison of a frame for the Russian verb and one for the Italian verb give the possibility of correlating (literally overlapping) each Russian verb of motion in A. Chekhov's short story The Duel with the corresponding Italian verb contained in five different Italian translations (which were published by different publishing houses over a 50-year span: from 1963 to 2014).

Ultimately, this methodological approach is also an objective tool for investigating similarities and differences between the source text and its translations, thus also evaluating the quality of the translations. Thanks to the Dice- Sørensen coefficient of similarity, it was possible to calculate the level of equivalence between the source text and the various translations and to demonstrate that three of the five existing translations contain solutions which are closer to the Russian source text.

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THE ROLE OF NEURAL REPURPOSING AND THE BALDWIN EFFECT IN THE EVOLUTION OF CONCEPTUAL SCHEMATICITY IN MUSIC

For most people, music is experienced as a set of pre-conceptual sensations rather than conceptual schemas that characterize the comprehension of propositional language. Exceptions to this are found in the case of professional musicians, who usually grasp pitch and rhythm schemas into concepts such as perfect fifths, tonics, and demisemiquavers. However, even non-professionals can conceptualize musical pitch using conceptual primitives (Antović et al., 2020), which poses the question about their origin. On one hand, the presence of conceptual primitives suggests they were canalized during the evolution of Homo sapiens or their direct ancestors. On the other, music lacks propositional meaning (Lerdahl, 2013), which is a mystery concerning the reasons for the evolution of musical primitives. The aim of this proposal is to present a possible evolutionary scenario that can explain not only the ubiquity of conceptual primitives but also the tendency to conceptualize musical schemas. In this scenario, instead of one common precursor of language and music (Brown, 2000, 2017; Fitch, 2005), a communicative niche is proposed which became the testing ground for different means of communication to solve the social challenges that emerged in response to the increasing social complexity of hominin groups. Such inventiveness based on plasticity through neural repurposing (i.e., the use of cognitive tools that involve implementing an existing neural circuitry in a functionally new circuit (Anderson, 2016)) played a crucial role in the testing of different means of communication. Music can owe its conceptual primitives to the repurposing of non-arbitrary sound-meaning mappings from language-like propositional vocalizations (Podlipniak, 2024). If the results of such a repurposing had been adaptive, it could have been taken under genetic control by employing the Baldwin effect. This view can be supported by the fact that neural repurposing is observed in contemporary communicative phenomena such as in tone and whistle languages.

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ENHANCING MULTI-LABEL SCHEMA PREDICTION WITH CLASSIFIER CHAINS: MODELING INTERDEPENDENCIES AMONG <FORCE>, <BALANCE>, <LINK>, <PATH>, AND <CONTAINMENT>

Predicting combinations of conceptual schemas in annotated corpora presents a significant challenge due to the complex interdependencies among schemas. This study focuses on five fundamental schemas—<FORCE>, <BALANCE>, <LINK>, <PATH>, and <CONTAINMENT>—which can appear in any combination, including instances where all five co-occur. Traditional multi-label classification methods often treat each label independently, failing to capture the underlying relationships between schemas, especially when minimal schema complexes involve at least two schemas.

To address this issue, we propose the application of *classifier chains* for schema prediction. Classifier chains are a multi-label classification technique that models label dependencies by arranging binary classifiers in a chain. Each classifier in the sequence predicts one schema while taking into account the predictions of all previous classifiers as additional input features. This approach enables the model to capture the conditional relationships between schemas effectively.

We implemented classifier chains using a sequence of binary relevance classifiers enhanced with schema interdependency information. Our experiments were conducted on an annotated corpus specifically designed for schema prediction tasks. The performance of the classifier chains was evaluated using metrics suitable for multi-label classification, such as Hamming loss, subset accuracy, and F1-score.

The results demonstrate that classifier chains outperform traditional multi-label classification methods that ignore label correlations. Specifically, our approach showed improved accuracy in predicting schema combinations, particularly in complex instances where multiple schemas are present simultaneously. This indicates that considering label dependencies is crucial for accurate schema prediction.

In conclusion, the application of classifier chains provides a robust solution for predicting complex schema combinations in annotated corpora. By effectively modeling the interdependencies among schemas, this method enhances predictive performance and offers valuable insights for future research in multi-label classification tasks involving intricate label relationships.

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IMAGE-SCHEMATIC BASIS OF NEWS STORIES: A CASE OF BBC TEXTS

Media studies have come up with a number of criteria for newsworthiness influencing selection of reported events: proximity, change, prominence, conflict, timeliness, usefulness, the unusual (Cotter 2011: 75). This presentation argues that newsworthiness mainly rests on image schemas, i.e., dynamic recurring patterns of organism-environment interactions (Johnson 1987: ix). Proximity is related to FAR-NEAR; prominence is linked to CENTER-PERIPHERY and to VERTICALITY underlying the formation of hierarchies; conflicts are based on COUNTERFORCE transformations; change results from the modification of schemas for force and motion.

Image schemas also underlie the choice of predicates and their arguments in the utterances structuring Headline, Main and Previous event sections (Dijk 1985: 74) of news stories in two main ways. Canonical utterances foreground the name of the source affecting the target according to the underlying schema as is the case with COUNTERFORCE, capturing the head-on meeting of forces (Johnson 1987: 45), e.g., Russia launches 'massive' attack on Ukrainian power grid (https://www.bbc.com/news/articles/czvvj4j4p8ro). Non-canonical statements foreground units referring to the target with the source name backgrounded or indicated in the text body. It is exemplified by BLOCKAGE, representing the experience of encountering a barrier (ibid): Teenager held over murder of Ukraine nationalist ex-MP (https://www.bbc.com/news/articles/cn07p5zrexvo).

The undertaken analysis homogenizes the classification of image schemas for force: each schema underlying text evolvement has a starting point and an abrupt or gradual ending leading to its transformation into an adjacent schema. For instance, the COUNTERFORCE termination results into CONTACT initiation with its further progress rendering a varying degree of closeness between the parties involved, etc.

To conclude, since both image schemas and news are related to the human sensorimotor experience the former permeate news discourse at several levels: newsworthiness, i.e., selection of reported events, their framing and choice of naming units.

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EXPLORING ATTENTION, COGNITIVE LOAD AND BRAIN CONNECTIVITY DURING MUSIC LISTENING

The purpose of this research was to investigate the cognitive mechanisms underlying the ability to read musical notations. Reading musical notations requires efficient integration of auditory and visual stimuli. Such integration is likely to be provided by means of functional connectivity between different brain regions. Furthermore, it should require maintaining a certain level of continuous attention and exerting a notable cognitive load. In this study, we aimed to evaluate the level of attention, cognitive load and functional brain connectivity during simultaneous music listening and reading music notations in an experimental group of 31 musicians and a control group of 13 people without any music education. We hypothesized that these metrics, measured using EEG (electroencephalography), change with the difficulty of the musical task, which depends on the music duration, tempo and the graphical representation of the musical scores. Higher tempo should require processing more audial information within the same time period, thus, increasing the difficulty of the task. Longer excerpts should have greater load on the working memory and require maintaining attention for a longer time. Finally, the amount of information contained in the graphical representation of the musical scores (pitch, rhythm) may also be crucial for efficient integration of auditory and visual stimuli. In our study, we used 5 types of visual representations for the musical scores: unmodified (1), containing information only about the pitch (2) or rhythm (3), containing information about the pitch in a verbal form (ex. 'do, mi, sol, etc.') (4), and with dots for each sound (no information about pitch and rhythm) (5). Such experimental design allowed us to see how concept construction during reading music notation depends on the available information and reflects the functional interactions between different brain regions that occur during the formation and processing of concepts in the musical domain.

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GRAPHIC SCORES AS TOOLS FOR MULTIMODAL MEANING CONSTRUCTION

A graphic score consists of images and/or texts which can be conceptualized and interpreted as a musical score, without necessarily employing any elements of musical notation. For over 70 years now, artist-researchers and practitioners including visual artists, electronic composers, improvisers and music therapists have been employing and theorizing upon graphic notation in rather diverse ways (Evarts 1968, Nyman 2012, Gottschalk 2016, Bergstroem-Nielsen 1993 & 2009), to the extent that it is now considered a hybrid art form (Shaw-Miller 2002) or intermedial practice in itself (Stefanou 2018). Recently, arts-based research methodologies (Leavy et al. 2018, Leavy 2020, Woods & Jones 2022) have popularized graphic scores, by encouraging their application across broader interdisciplinary research contexts that occasionally extend beyond music and its cognate disciplines (Lomax 2018, Woods & Jones 2022, Stefanou 2022). While this growing interest ensures continuing engagement with the practice, it also exposes the need for a more nuanced and contextualized appreciation of the relationship between graphic notation, sound and musical meaning, taking into account how graphic scoring is understood, applied and evaluated across different disciplines and backgrounds. In the context of Soundsketcher, an ongoing project exploring the development of an automated sound visualization and graphic notation tool, we identify three modes for conceptualizing graphic notation, and by extension three distinct but complementary approaches to multimodal meaning-making through (a) sound as an object to be visualized, (b) sounding as an emergent outcome of imaginative listening and (c) sonic communication as a dynamic, reflexive process of conceptual integration and dis-integration. In summarizing and critically reviewing these approaches, we also identify best practices and challenges for the creative study of graphic notation in interdisciplinary and collaborative research contexts.

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SOUNDSKETCHER: EXPLORING CROSS-MODAL CORRESPONDENCES FOR THE DEVELOPMENT OF A SOUND VISUALIZATION AND GRAPHIC NOTATION TOOL

The graphic representation of sound structures, particularly in electronic or improvised experimental music without traditional scores, poses a unique challenge. Existing tools often require manual input, making the workflow labor-intensive and ad hoc. To facilitate this process, we introduce Soundsketcher, an innovative tool that automatically converts audio files into graphic scores, assisting users in learning, analysing, and co-creating music.

Soundsketcher employs advanced algorithms to visualize sound characteristics, utilizing well-established auditory-visual correspondences such as the bouba/kiki effect (Ramachandran & Hubbard, 2001). By doing so, it creates perceptually coherent visualizations that help users grasp the structure and nuances of sound. This tool allows users to upload audio files and select which sound characteristics they wish to visualize, providing a tailored and insightful analysis experience.

The core functionality of Soundsketcher involves mapping auditory properties to graphic representations that may also form the basis for original graphic scores. Visual elements, such as line length and width, shape or color, correspond to specific sound features such as pitch, loudness, inharmonicity, noisiness, etc. For example, higher frequencies might be represented by higher vertical positions, brighter colors or sharper shapes, aligning with intuitive sensory correspondences (Eitan, 2017; Parise & Spence, 2013; Speed et al., 2021).

Soundsketcher's interface is designed to be user-friendly, making it accessible to a wide range of users, from educators and students to professional musicians, composers and improvisers. By transforming audio files into visual sketches, Soundsketcher aspires to enhance educational, research and creative pursuits, offering new ways to explore and understand sound.

Future developments will integrate artificial intelligence to further refine sound source separation and sound object identification, allowing for more detailed and dynamic visual representations (Adeli, Vellera, & Müller, 2014).

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THE PROMINENCE OF ROUGHNESS IN MUSIC COGNITION: PERSPECTIVES FROM CROSS-MODAL, IMAGE SCHEMATIC, LINGUISTIC AND MUSIC-THEORETICAL APPROACHES

The concept of roughness can meaningfully describe qualities across various modalities, such as touch, hearing, vision, and taste, leading some researchers to suggest it may constitute an amodal attribute (Di Stefano & Spence, 2022). Besides being considered the most salient dimension in the tactile perception of texture, roughness also consistently appears as one of the most prominent concepts in timbre semantics (e.g., Zacharakis & Pastiadis, 2016; Wallmark, 2019; Reymore & Huron, 2020). Interestingly, recent evidence suggests that roughness is the most universally agreed-upon descriptor of timbre across different linguistic groups and levels of musical expertise. (Zacharakis et al., 2014; Wallmark, 2020; Zacharakis & Pastiadis, 2021; Rosi et al, 2023). Furthermore, direct correspondences between auditory and visual roughness (e.g., Giannos et al., 2021) or auditory and vibrotactile roughness (e.g., Bernard et al., 2022) have been documented. Semantics and cross-modal correspondences aside, the existence of a general smooth-rough schema has also been proposed (Rohrer, 2005; Johnson & Rohrer, 2007; Setchi & Asikhia, 2017). This schema is suggested to serve as a sensory component of another prominent concept in music cognition: tension and release (Pressnitzer et al., 2000; Huron, 2006; Farbood & Price, 2017; Zacharakis & Pastiadis, 2021). Given evolutionary evidence, roughness – whether auditory, tactile, or visual – signifies danger and alarm (see Di Stefano & Spence, 2022 for a review), thereby increasing tension. Thus, auditory roughness appears to be a structural component in music, and contemporary music graphic scores frequently use roughness-related visual representations to convey textural qualities. This presentation will explore paradigms of auditory roughness visualizations while challenging the notion that auditory roughness "being entirely temporal in nature" lacks a spatial component (Di Stefano & Spence, 2022). Instead, it will examine potential perceptual nuances between vertically dissonant sonorities (i.e., shorter timescale) and granular, discontinuous textures (Smalley, 1997).

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THEMATIC AMBIGUITY AND RHETORICAL DISPLACEMENT IN MAHLER'S FIFTH: A SEMIOTIC ANALYSIS OF THE LANGSAM THEME FORMAL FUNCTION IN THE SCHERZO MOVEMENT

In the Scherzo movement of the Fifth Symphony, Mahler employs innovative compositional techniques that appear to diverge from Classical tradition. However, through a semiotic lens, these variations can be seen as modern extensions of Classical norms within the formal structure. Utilizing Agawu's introversive semiotic approach (2009), this paper explores how the Scherzo movement's form adheres to the Classical rhetorical paradigm of Beginning-Middle-Ending (BME). Interpreting each formal section within the BME paradigm, allows one to assess the complexity and continuity of Mahler's musical materials by revealing the functional and hierarchical relationships between implicit, loosely connected events that still reflect preserving the logic of sectional order within the ABA ternary form typical of a Scherzo.

Central to this movement is the thematic ambiguity surrounding the recurrence of the Langsam theme, which contrasts with the Scherzo themes and challenges conventional sectional distribution. For example, traditionally analysed as the start of a new Trio section, the Langsam theme's initial appearance is accompanied by rhetorical signs that do not indicate a new section. Instead, a long Middle sign followed by a long Ending sign suggests thematic continuity rather than division. This thematic vs. rhetorical displacement leads to a reinterpretation of the traditional formal analysis as a simplified three-part form. This long-range view is justified by the complexity and length of Mahler's movements, which demand extensive rhetorical signs to maintain structural balance. The BME paradigm reflects a bottom-up approach, letting the traditional ternary form emerge out of the music rather than forcing the music into a preconceived mold. This semiotic interpretation of the Classical BME paradigm thus has the capacity to explain complex modern musical thoughts throughout the entire Fifth Symphony and extends to symphonic works by Mahler and other Modern composers.

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PATTERNS OF SEMIOSIS AND SEMIOPOIESIS: WHAT MOLECULAR GENETICS CAN TEACH SEMIOTICIANS

It has been demonstrated that self-assembly and self-organization processes alone cannot fully explain the origin and functioning of the genetic code (GC). Additional symbolic control, such as autogene (Deacon), codepoiesis (Barbieri), and biosemiosis (H. Patti) is needed. This has led to a deeper understanding of the semiotic mechanisms of the GC. Initially, analogies were drawn from the semiotic mechanisms of natural language, with the GC being likened to a dictionary for translating from the language of nucleotides to the language of amino acids (Crick). Now it has been revealed that it is not fixed signs, but rather schemes of regular association that are at play.

The following characteristics are noteworthy and require rethinking of the usual schemes of semiosis: 1. Codons (nucleotide triplets) are correlated with an amino acid through intermediate stages; at each, their biochemical structure is completely changed. It is not the biochemical characteristics that are important, but the ones set by the distinguishing system; 2. The amino acid is synthesized independently of DNA, A sign operation arises as a closure of the previous operations of codon transformation by the new sign "anticodon – amino acid." 3. Depending on the context, the identical triplet of nucleotides acts as a signal for translation initiation; in addition, specific stop codons do not correspond to any amino acid and instead signal the completion of operations. 4. Genomic DNA is the same for all cells but contains regulatory codes enabling the various programs to be realized

The features mentioned above allow us to reconsider semiosis as a dynamic process of self-creation of a sign (semio-poiesis). This revives Peirce's conception of the sign as a quasi-mind and as a pattern of association between the quasi-utterer and the quasi-interpreter welded in the sign.

SCHEMAS IN LANGUAGE, MUSIC, AND VISUAL COGNITION
Book of Abstracts

Publisher:
FACULTY OF PHILOSOPHY
UNIVERSITY OF NIŠ

For the Publisher:
Natalija Jovanović, PhD, Dean

Publishing Unit Coordinator:
Sanja Ignjatović, PhD, Vice-Dean for Science and Research

Technical Editorial Office:
Darko Jovanović (Cover Design)
Milan D. Ranđelović (Technical Editing)
Publishing unit (Digital Publishing)

Format:
17 x 24

Print Run:
50

Press:
Faculty of Philosophy

Niš, 2024

ISBN 978-86-7379-660-4

CIP - Каталогизација у публикацији
Народна библиотека Србије, Београд

81'1:165(048)
81'37:165(048)
159.931/.936(048)
78:81(048)

SCIENTIFIC Conference Schemas in language, music, and visual cognition (2024 ; Niš)
Book of abstracts / Scientific Conference Schemas in language, music, and visual cognition,
University of Niš, Serbia Faculty of Philosophy 6–7 December 2024 ;
priredili Mihailo Antović,
Biljana Mišic Ilić, Miloš Tasić. - Niš : Faculty of philosophy University, 2024
(Niš : Unigraf-X-Copy)
. - 40 str. ; 24 cm

Тираж 50

ISBN 978-86-7379-660-4

1. Mišić Ilić, Biljana, 1962- [уредник]
а) Когнитивна лингвистика -- Апстракти б) Когнитивна семантика -- Апстракти в) Музика -
- Лингвистика -- Апстракти г) Визуелна перцепција -- Апстракти

COBISS.SR-ID 158275849