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On the embedded cognition of non-verbal narratives

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Abstract. Acknowledging that narratives are an important resource in human communication and cognition, the focus of this article is on the cognitive aspects of involvement with visual and auditory non-verbal narratives, particularly in relation to the newest immersive media and digital interactive representational technologies. We consider three relevant trends in narrative studies that have emerged in the 60 years of cognitive and digital revolution. The issue at hand could have implications for developmental psychology, pedagogics, cognitive science, cognitive psychology, ethology and evolutionary studies of language. In particular, it is of great importance for narratology in relation to interactive media and new representational technologies. Therefore we outline a research agenda for a bio-cognitive semiotic interdisciplinary investigation into how people understand, react to, and interact with narratives that are communicated through non-verbal modalities.

Keywords: Non-verbal narratives, narrative cognition, digital culture, semiotics, multi-modal, digital technologies

Introduction

As originally conceived among others by Roland Barthes and Claude Bremond in the late 1960s, narratology was to be a field of study that could transcend disciplines and media. However, as pointed out by Ryan (2006), in the following thirty years it took a direction almost exclusively concerned with written literary fiction. For different reasons, that will be described below, in the last three decades the exclusivity

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of the logocentric nature of narrative and its ontological status as literary fiction has been challenged. Therefore, acknowledging narratives as an important resource in human communication and cognition, the purpose of this article is to outline a research agenda to investigate the embedded cognitive processes involved when people understand, react to, and interact with narratives that are communicated through non-verbal modalities. Given the growing dominance of the visual modality in contemporary digital culture, the issue is particularly important when seen in relation to the increasing ubiquitousness of new representational and interactive technologies (Bruni 2014a). Such technologies *immerse* the user perceptually and cognitively and expand the possibilities of mediating virtual environments and narrative events.

In spite of the obstacles posed by the predominant language-based approach to narrative (Ryan 2006), there are good reasons to elucidate the salient cognitive processes of these less investigated aspects and modalities of narrative communication. In the last three decades, the study of non-verbal forms of narrative has included film studies (Bordwell 1985, 2012; Bordwell, Thompson 2008; Chatman 1978), pictures (Varga 1988; Wolf 2005), comic strips (Cohn et.al. 2011, 2012; McCloud 1994), painting (Bal 1991; Steiner 2004[1988]), photography (Hirsch 1997), opera (Hutcheon, Hutcheon 1999), television (Kozloff 1992; Thompson 2003), dance (Foster 1996), and music (Abbate 1989; Grabócz 1999, 2007; Tarasti 2004; Seaton 2005; Rabinowitz 2004; Sternberg 1992). However, there has been no consensus about what is actually a non-verbal narrative, particularly, about whether the possibility of such a narrative mode is necessarily bound to language: whether it can exist but only as an intermediary or surrogate process originally encrypted or codified in natural language, or if it is possible that a narrative experience can be totally independent from language.

With her "transmedial approach", Ryan demonstrates that not all stories can migrate from one medium to another without presenting some cognitive challenges or consequences: "A core of meaning may travel across media, but its narrative potential will be filled out, actualized differently when it reaches a new medium" (Ryan 2006: 4). More than the migration from one medium to another, the focus of this article is on the eventual differences in sensorial modalities (visual and auditory) when conveying a non-language based narrative. In media relativism two different media cannot convey similar meanings or use similar devices (Ryan 2006). The question we raise here is whether there is ground for a similar "modality relativism", where a narrative could not be conveyed in two different sensorial modalities without losing some of its original substance. In the following, the importance of this matter will be made evident by considering three trends (or domains) in which the notion of narrative has become a central element, often determining new fields of enquiry and societally relevant applications.

Narratives beyond the literary realm

Narratives have existed all along the history of humankind as a central element for the construction of individual and collective meanings. Therefore, the study of narrative communication has been a constant since Classical culture to our days. Here a distinction can be made between the actual history of the development of theoretical concepts about narratives, i.e., a historiography of narrative theory, and the "diachronization of narrratology", i.e., a historically contextualized study of the use made by authors of narrative devices (Fludernik 2003; de Jong 2013, 2014). Such rich cultural patrimony reflects the centrality that narrative communication has had in the way in which we humans understand ourselves, each other, our history, our culture and the world around us. This centrality gives rise to the first trend under consideration here, namely that *the study of narratives has gone beyond the exclusive domain of literature and art*, and narrative has been acknowledged and investigated as a universal cognitive mode in humans. Self-constructed narratives contribute to the formation of a person's mental model of experience, sense of personal and cultural identity, and are involved in the creation of memories and social relational patterns (Barthes 1975; Ricouer 1984; Polkinghorne 1988; Bruner 1990). In this direction we have witnessed new social and psychological applications of narrative theory, as for example the growing interest in fields such as narrative therapy (White, Epson 1990), narrative pedagogics (Goodson, Gill 2011) and social constructions of identity (Kleinreesink et. al. 2012; Corman 2013). Conversely, as narratives are thought to be part of the fundamental nature of the self, their pathological manifestations may have important consequences for a person's psychological health as well as for the dynamics of cultural sustainability.

Besides all the exciting and beneficial uses of a "narrative framework", there is also a risk that the popularity of the term "narrative" in the last two decades dilutes its meaning into "belief", "value", "experience", "interpretation", or "content", making it difficult to discern when the concept is truly central for a given framework (Ryan 2006: 6–7). According to Ryan, this dilution can only be prevented by rigorous definitions of what constitutes a narrative in the specific context and by broadening the concept beyond the verbal, but at the same time compensating by a semantic narrowing down so that not all contents of all media end up being considered as narratives. In this sense, "[t]he property of 'being a narrative' can be predicated of any semiotic object produced with the intent to evoke a story to the mind of the audience" (Ryan 2006: 11).

The prominent role of narratives in new media and digital cognitive technologies

The second trend considered here has to do with how the digital revolution has contributed to expand the domains in which our ways of generating and understanding narratives acquire prominence. The advent of new media expands significantly the possibilities for interactivity in the production and reception of narrative structures and the involvement with narrative-driven representational content. In this sense, digital immersive-interactive technologies are not limited to be fancy interfaces but can also afford new multimodal and interactive modes of meaning-making (Bruni 2011, 2014a). We can therefore see clear trends in the development of interactive narrative-based technologies for many different purposes (e.g. communicational, pedagogical, educational, didactic, persuasive, therapeutic, health, entertaining, ecological or artistic purposes). This is reflected for example in such emerging fields as computational narratives (Broniatowski, Reyna 2013; Bolioli et. al. 2013; Bhatt et. al. 2013; Damiano, Lieto 2013), narrative logic (Dumas et. al. 2010; Szilas 1999), interactive narratives and digital storytelling (Schoenau-Fog, et. al. 2010; Baceviciute et. al. 2012; Mulholland, et. al. 2012), edutainment (Kalogeras 2013; Marsh et. al. 2011; Heiden et. al. 2010), ambient intelligence (Bhatt, et. al. 2013; Guger et. al. 2008) and cybermedicine (Si et. al. 2010; Szilas et. al. 2010), for instance.

Therefore the canonical linear mode of reception is being altered, introducing new complexities into cultural dynamics. This trend can be expected to grow as the pervasiveness of sophisticated intelligent, automated, immersive, interactive technologies and virtual or augmented environments will be an increasing tendency in the near future (Bruni 2011, 2014a). It is therefore easy to foresee an exponential increase in narrative consumption in transmedial platforms that engage our cognitive systems in new challenging ways.

The cognitive aspects of narrative generation and intelligibility

There are several signs that indicate that in the last two decades the so-called "cognitive turn" is also gaining prominence in the study of narrative communication. Therefore the third trend that we are considering, which is central for the scope of the present article, has to do with the recent interest in *the cognitive aspects of narrative generation and intelligibility*. This can be seen in the proliferation of disciplines, paradigms and fields of inquiry that are interested in, or have as focus, the relation between cognition and narratives (Finlayson et. al. 2013; Sanford, Emmott 2012; Ryan 2006, 2010).

Ryan (2010) reviews the "problematic" relation between narratology and cognitive science, and elaborates on three realms in which this relation is gaining importance: the study of the minds of characters; inquiries into the cognitive and interpretative processes of readers and spectators; and research on narratives as a mode of thinking and apprehending the world. She departs from the view common among narratologists (e.g. Abbott 2002), in which "story" (*fabula*) is an event or a sequence of events while "narrative discourse" (*syuzhet*) is the way those events are represented. According to Ryan (2006), the two components play asymmetrical roles: narrative discourse (which is leaning to form) is defined in terms of, and therefore it depends on, its ability to represent *that* which constitutes a story, while on the contrary, story (leaning to substance), can be defined in autonomous terms from the discourse (which is actually an instantiation of the story). Regarding stories as a series of events ends up equating stories with events, whereas events are in fact the raw material out of which stories are made. This brings about an important suggestion for the exploration of what constitutes *narrative cognition*:

> Story, like narrative discourse, is a representation, but unlike discourse it is not a representation encoded in material signs. Story is a mental image, a cognitive construct that concerns certain types of entities and relations between these entities. Narrative may be a combination of story and discourse, but it is its ability to evoke stories to the mind that distinguishes narrative discourse from other text types. (Ryan 2006: 7)

This ability to evoke stories in the mind can be considered not only as a communication act but also as a human cognitive mode for organizing experience. Either or both modes can be operative in different narrative contexts. These two different "functions" of narratives entail two different but interrelated processes of meaning generation, interpretation and reception in a narrative communication act. On the one hand there is the process in which a cognizer receives or generates meaning in a way that is close to what is intended, desired or expected by the initiator of the process (an author, for instance). On the other hand, the cognizer may construct meaning out of what is being mediated, or perceived, independent of whether that meaning corresponds or gets close to what is intended by an initiator, or even of whether such an initiator exists at all. We have proposed to refer to the former process as *narrative intelligibility* (i.e. fidelity of communication) and to the latter one as *narrative closure* (i.e. the sense of having experienced a narrative) (Bruni, Baceviciute 2013).

When dealing with narrative and cognition, Ryan (2010) draws a continuum that leads from speculative and interpretative approaches – such as literary theory and classical narratology – to highly experimental and empirical approaches, in which narratives are just an instrumental tool to explore higher cognition – such as in

different branches of experimental (cognitive) psychology and cognitive neuroscience. For example, in the middle of this continuum we can find the relatively new field of cognitive narratology (Jahn 1997; Herman 2007, 2009, 2010) – a "post-classical" derivation of structuralist narratology that has been under development in the last two decades. As an interdisciplinary endeavour it borrows ideas from both sides of the continuum, combining analytical tools from the "soft" humanistic disciplines with concepts from the "hard" empirical cognitive scientific fields. This intermingling has not yet resulted in a rigorous empirical strategy and remains in a strictly speculative vein (Ryan 2010). Furthermore, so far, cognitive narratology does not seem to be interested in transcending the logocentric bias of the great majority of narrative investigations. An exception in this regard is Herman (2009), who emphasizes the importance of transmediality in cognitive narratology, postulating it as a discipline that encompasses "the nexus of narrative and mind" in all kind of media capable of storytelling, and in different communication contexts where narratives are a resource for structuring and comprehending the world – including computer-mediated narratives. Furthermore, Herman (2010) has also considered multimodality in narrative communication, still including natural language in the multimodal construct.

Interest in the cognitive aspects of involvement with narratives is also increasing in the emerging field of cognitive semiotics (Zlatev 2012; Ranta 2011; Matuk 2010; Lee 2012). Yet surprisingly there has been very little communication between the cognitive semiotics and the cognitive narratology communities, a link which we find very natural to pursue. Analogously to cognitive narratology, the research agenda of cognitive semiotics entails the integration of methods and theories developed in the disciplines of cognitive science with methods and theories developed in semiotics and the humanities, with the ultimate aim of providing new insights into the realm of human meaning production.The dialogue could be extended to biosemiotics, which could also make a significant contribution by providing more adequate notions of "representation" and "information" than classical cognitive sciences (Favareau 2008) and by helping to link the embedded levels of analysis in narrative cognition, from the physiological to the phenomenological. Moreover, the biosemiotic approach is highly congenial with a non-logocentric, nonverbal, non-(exclusively) symbolic or linguistic treatment of sign systems and meaning making, opening therefore possibilities for the exploration of the different nonverbal narrative modalities.

A recent significant contribution exploring the relation between narrative and cognition is the work of Sanford and Emmott (2012), where the authors examine the psychological and neuroscientific evidence for the mechanisms which underlie narrative comprehension. They explore the scientific developments which demonstrate

the importance of attention, memory representations, depth of processing, and what they called "embodiment effects" in narrative processing, (i.e. "experiencing a seemingly physical sense of rich perceptual and motor descriptions", Sanford, Emmott 2012: 268). This interdisciplinary contribution provides a link between the latest findings of cognitive psychology and neurosciences and the humanistic disciplines that deal with narrative comprehension. Even though this work is centred mostly on the linguistic modes of narrative comprehension, there is one particular issue of great interest to nonverbal narratives. This has to do with the experiential aspects of involvement with narratives described through the lens of embodiment theory. In this context, the embodiment framework has brought into focus the relations between language and the perceptual system on the one hand, and imagination, perception and action on the other hand. Their approach to embodiment in narrative processing starts by gathering current empirical findings from neuroimaging and brain-mapping studies. They relate bottom-up descriptions of lower-level processes that may add up to the complexities of obtaining a mental simulation of the events codified in a written narrative. This description of embodiment relies on the framework of "mirror-neurons" that has been developed in contemporary cognitive neuroscience. However, interpreting the embodiment aspects with too much emphasis on neural correlates may create reductionist obstacles when integrating factors of explanation from different levels of analysis. This is where a biosemiotic approach could offer an advantage, by considering simultaneously the different levels of aggregation of information – from the multimodal binding and categorization of percepts to their integration into the complex semantic patterns that characterize the development of a narrative structure. Such approach does not require or necessitate a deterministic mapping between the "substrate" and the phenomenological sphere of meaning-making, a point that is central to our agenda and to which we will return.

Even though there has been a rich history of alternative theoretical frameworks and models of cognition in the last 30 years, these innovations have very seldom been included in the more practical implementations of knowledge for the development of representational technologies or for the characterization of involvement with narratives.

Multimodal, visual and auditory narratives

There are new interesting developments that have links to the rich body of research related to cognitive linguistics and conceptual metaphor theory (Lakoff, Johnson 1980, 1999), which are relevant for our topic here. In particular recent work in nonverbal and multimodal metaphor (Forceville 2009; Forceville, Urios-Aparisi 2009)

faces some research problems analogous to the ones found in the field of non-verbal narratives, where there is a paucity of empirical studies dedicated to the cognitive aspects of non-verbal narrative communication. Page (2010) states that a narratology derived from the study of verbal resources alone can no longer be fully adequate to the task of investigating storytelling in its broadest sense. However, the field of "multimodal narratives" is still mainly concentrated on the *paralinguistic* features of narratives (e.g. gestures and emotional tones in a narrator's utterances) and not so much on the possibility of a non-language based narrative.

In narratives, just as in metaphors, an exclusive or predominant concentration on verbal manifestations may be blinding researchers to important cognitive aspects of narrative intelligibility and closure. Some of these approaches would accept the existence of visual narratives only if these can be considered as the visualization of the utterance of a narratorial figure (Ryan 2006). For example, Cassell and McNeill (1990) acknowledge the fact that there is narrative information at other levels or modalities than just the linguistic, for example in comics or films. They recognize that when people tell stories they speak not only about the events of the story per se, but also about the characteristics of the representation and narration of the story. Therefore, they stress the importance of the proxemics of speech and recognize that gestures can help to differentiate between the different levels of narratives. This implies that codification of the narrative is not only based on the symbolic qualities of spoken language, but is also being codified in the non-symbolic characteristics of proxemics (see also Page 2010). However, their "event lines and narrative level" model is still based on what Ryan calls the utterance of a narratorial figure.

When investigating narrative as a cognitive mode for organizing experience, an important question is whether the generation and reception of narrative structures necessarily have to be translated or codified into natural language, even if they are presented in non-linguistic modalities as in visual and non-language auditory stimuli (e.g. soundscapes, music). The question entails, for example, whether animals, allegedly not possessing the symbolic capacities afforded by natural language, or children under language-acquisition age, can organize thoughts, events and experiences in a narrative mode. This is another aspect that would be interesting to approach from a biosemiotic point of view. In an earlier study, Pappas (1993) set out to question the "common assumption" that children's abilities to understand and compose stories precede their capabilities to understand and use non-story written language. But this is different from saying that a capacity to form and generate non-language-based stories precedes our later capacity of codifying stories with the aid of language. A related question is whether narrative structures can be communicated between individuals without operating a temporary language codification when communicating visual to visual. This would be like saying whether it

is possible to communicate iconically without any symbolic interface. Speculating about why mammals need to form *images* to be presented to the "mind's eye" instead of processing directly the quantitative bits of perceptual information, Bateson (1979) claims that image formation is perhaps a convenient or economical method of passing information across some sort of interface, and that the cognitive processes of mammals must be dealing with many different interfaces. So if we as mammals are able to codify or integrate digital bits into an analogical image at the perceptual level, could the same apply to the cognitive level of narrative formation? What are the advantages of codifying an iconic representation of narrative into a symbolic representation? The underlying implicit semiotic question would be, whether the substance conveyed narratively leans more towards the iconic or the symbolic, and whether this leaning is dependent on its communication in the verbal or non-verbal modalities. This issue, which we could call the "threshold of narrativity", is two-sided: firstly, what are the minimal requirements for a mental organization of events to count as a narrative; and, secondly, what are the minimal cognitive structures and functions that can afford it. Would iconic re-enactments of past events through pantomime as those exhibited by orangutans (Russon, Andrews 2010) be on the threshold of narrativity? In this direction, Ryan offers a "semi-parametric" set of criteria for defining narrativity as a scalar property rather than as a rigidly binary feature that divides mental representations into stories and nonstories (Ryan 2006). In her model, therefore, the quality of being a narrative is not a matter of "yes" or "no", but rather a matter of "more" or "less".

When addressing nonverbal narratives, the main perceptual modality that has been considered is the visual, whereas the auditory modality has received much less attention. Even though semiotics in general and cognitive semiotics in particular have produced considerable theoretical contributions to the study of visual narratives – especially in the cognitive semiotics tradition of Greimas (1989) – there is very little empirical research in the field, and even less in relation to the increasing preponderance of the visual modality in new interactive digital media. Similarly, besides considering the narrative-evocative possibilities of music (e.g. Eyre 2007; Maus 1997), the auditory non-verbal modality has been surprisingly little investigated. Thus there is also a need to explore the evocative qualities of narrative soundscapes that are related to new digital sound technologies (Cuddy-Keane 2005; Schafer 1977).

Towards a research agenda for non-verbal narratives in digital culture

The intention of this article is to highlight the need for a research agenda that can theoretically and empirically deal exclusively with the nonverbal, and even the preverbal, realm in narrative generation and intelligibility, with particular focus on multimodal representations in interactive and immersive digital media. This direction can draw inspiration and theoretical background from the rich semiotic tradition in the study of nonverbal communication, including the newest developments in biosemiotics and cognitive semiotics.

The issue could have implications for developmental psychology and pedagogics as it could provide insight into whether children under language acquisition age can organize thoughts, events and experiences in a narrative mode. It could also be of interest for cognitive scientists, cognitive psychologists, ethologists and evolutionary studies of language. In particular, it is of great importance for interactive media and new representational technologies in order to understand the learning patterns that are instantiated when reacting to, and interpreting, incoming information from ubiquitous user interfaces that bring together cognition, reaction and action in narrative trajectories without explicit language-based representations. This could aid the design of technological solutions for mediating important content in situations where written and spoken language is not an option, as for example in scenarios involving contexts or persons with particular impairments who may benefit from a more direct body-environment interaction where needs, action plans, and interactive sensomotoric couplings could be mediated through narrative logic. A bio-cognitive semiotic approach could be of value to develop an interdisciplinary theoretical framework in order to connect what we consider the four implicit levels of analysis necessary for the investigation of the cognitive aspects of narrative intelligibility in general, and of non-verbal narratives in digital representational technologies in particular, namely the psychophysiological, the perceptual-cognitive, the technological and the cultural levels.

If we acknowledge Ryan's (2010) account of the problematic relation between cognitive and narrative studies, the main challenge remains bridging the gap between bottom-up approaches that tend to biologize human cognition and experience (sometimes becoming excessively reductionist) and top-down approaches that consider the phenomenological level (but face the empirical problem of assessing subjective experience by first-person accounts). This is especially the case when dealing with the kind of higher level cognitive processes and affective states involved in narrative intelligibility, closure and related cognitive processes that could be considered in such a framework – as e.g. semantic congruency, emotional states,

meaning and sense-making, categorical perception and categorization. Furthermore, Ryan (2010) is critical of experimental approaches in that they focus almost exclusively on the most automatic and unconscious of mental operations, which are often indistinguishable from the processing of language. Part of the critique is that results obtained in this manner may end up being common-sense truisms already known to literary theorists and narratologists, which just become "scientifically confirmed". Another difference between the two sides of the spectrum between literary studies and cognitive neuroscience is the foci of interests. The concern of cognitive and psychological approaches to narrative is not so much the elucidation of important aspects of narratives but rather the investigation of higher-order cognitive processes elicited by narratives. In other words, narratives are just stimuli for the investigation of e.g. understanding, particularly in brain-imaging experiments for localizing brain areas (see for example Zacks et. al. 2010; Speer et. al. 2009; Yarkoni et. al. 2008; Mar 2004). In our view, we see the necessity to invert this kind of relation: "the nature of understanding", i.e. (narrative) intelligibility and closure, could become an experimental construct, or a variable, necessary to research the nature of nonverbal narratives. In this direction we consider experimental designs that involve state-of-the-art media technology for the design of virtual environments with embedded narrative events, coupled with psychophysiological methods (such as EEG and ERP methodologies and other affective and behavioural signals). The challenge remains the attempt to bridge the gap without renouncing a scientific empirical approach on the one hand, and without disregarding the irreducibility of subjective phenomenological experience on the other. Seen from this perspective, it is possible to construct bridges between biosemiosis, cognitive semiosis, and narrative cognition, which are very different from the biological reduction sometimes implied by cognitive neuroscience, so their relations should not be a matter of concern for humanities-oriented semioticians and narratologists.

Our perspective therefore considers different thresholds, kinds, and levels of semiotic freedom (Bruni 2008b) – i.e., the increase in indeterminacy as semiotic processes and agents gain in sophistication – that are concomitantly embedded in the physiological, cognitive, technological and cultural processes of narrative intelligibility and closure (Bruni, Baceviciute 2013). Such a scale of semiotic freedom ranges from the very basic sense receptors and neural activations to multimodal image formation, to the very human sophisticated capacity for narrative intelligibility. Between these extremes there are a myriad of embedded semiotic processes that have to do with many forms of patter-recognition, categorical sensing and perception, integration and semantic congruency, and many other related physiological and cognitive processes. Such processes can be found either as "prototypic" forms with low levels of semiotic freedom, or as more developed manifestations with

increasing levels of semiotic freedom as for example in the open and creative instantiations of narrative communication. They are semiotic in nature in the sense that they imply triadic logic because there are different kinds of representations involved, which are specific to the different levels outlined above (e.g. sensing, perception, categorization, etc.). This constitutes a continuous functional cycle from sensing/perception to integration/association/cognition to response/action/behaviour, involving concomitant heterarchically embedded processes (Bruni 2008a, 2014b). As most of current cognitive and digital technologies that immerse us in digital culture can afford narrative-based representations, or are somehow mediating narratives, it has become important to understand such cognitive processes in relation to the complex dynamics that the pervasiveness and the increase of narrative exposure in digital culture entail.

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О когниции невербальных нарративов

Признавая, что нарративы являются важным ресурсом человеческой коммуникации и когниции, автор исследует когнитивный аспект визуальных и аудитивных невербальных нарративов, особенно в связи с новыми иммерсивными медиа и дигитальными интерактивными технологиями репрезентации. Рассматриваются три важных направления в нарративных исследованиях, возникших во время когнитивной и дигитальной

революции в течение последних 60 лет. Данная тема соприкасается с такими дисциплинами, как психология развития, педагогика, когнитивистика, когнитивная психология, этология и эволюционная лингвистика. Таким образом создается исследовательская программа биокогнитивной семиотической интердисциплинарной работы, рассматривающей, каким образом люди понимают передаваемые невербальными модальностями нарративы, как на них реагируют и как с ними взаимодействуют.

Mitteverbaalsete narratiivide kognitsioonist

Tunnistades, et narratiivid on inimkommunikatsiooni ja kognitsiooni oluline ressurss, keskendub see artikkel visuaalsete ja auditoorsete mitteverbaalsete narratiividega tegelemise kognitiivsele aspektile, eriti seoses uusima immersiivse meedia ja digitaalsete interaktiivsete representatsioonitehnoloogiatega. Vaatleme kolme olulist suundumust narratiiviuuringutes, mis on tekkinud 60 aastat kestnud kognitiivse ja digitaalse revolutsiooni vältel. Teema on seotud ka arengupsühholoogia, pedagoogika, kognitiivteaduse, kognitiivpsühholoogia, etoloogia ja evolutsioonilise keeleteadusega. Seega visandame uurimisprogrammi biokognitiivsele semiootilisele interdistsiplinaarsele teadustööle, mis vaatleb seda, kuidas inimesed mõistavad mitteverbaalsete modaalsuste kaudu edastatavaid narratiive, neile reageerivad ja nendega vastastiktoimes on.