

LAURI LINASK

Autocommunication
in the Semiotic Development
of the Child



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47

LAURI LINASK

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in the Semiotic Development
of the Child



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INTRODUCTION

In the broadest sense, this dissertation examines how young children's meaning-making evolves as they become active participants in their culturally meaningful environments. Humans are uniquely cultural beings to the extent that culture is frequently characterized and confined as specific to humans, for better or for worse. For humans, culture and culturally inherited means of meaning-making are inherently prerequisites of their survival. Humans carry these means along within, even in case they become isolated from their cultures. However, humans are not born with an innate understanding or comprehension of their cultural surroundings, and meaning-making does not remain uniform throughout childhood.

Access to the cultural environment develops over time in the course of social and cultural interaction gradually, and sometimes step by step, during such processes as concept formation, language acquisition, and formation of narrative thought, among many others, which all characteristically involve meaning. During this interaction, as the young child changes physically, physiologically, psychologically, and culturally in the course of ontogeny, it is not only the child's relationship to the surrounding world that is transformed, but the child's relationship to her or himself as well – as a part of this world. The child's thinking is transformed in relation to itself. Therefore, as the child's meaning-making evolves in communicative interaction with the surrounding culture, the child also undergoes changes in this process in communicative interaction with him or herself.

In semiotics, meaning is understood to be constituted by signs. Although all types of signs and all kinds of meaning-making are involved in culture in general, the majority of semioticians agree that, specifically, culture may be characterized as arbitrary and conventional meaning-making by symbolic signs, as exemplified by natural language. Most semioticians also share the view that, specifically, the formation of symbolic signs enables purely conceptual thinking, even though other signs may also contribute. By way of adopting means of meaning-making characteristic of the surrounding culture (becoming “symbol-minded”, as DeLoache [2004] calls it), largely constituted by artefacts embodied with symbolic meaning, children enter into their cultural and linguistic communities.

The acquisition, or emergence, of symbols and symbol use broadly, as well as language, specifically¹, has been one of the most complex problems of human development to explain across ages, bridging various approaches in philosophy, linguistics, anthropology, developmental and cultural psychology, cognitive sciences, neurosciences, and semiotics, among others. The problem of

¹ In other words, the “symbolic threshold”, as it has been called in recent years after the anthropologist, neurobiologist and biosemiotician Terrence Deacon's influential book *The Symbolic Species* (1997). The term is used for both phylogeny and ontogeny of emergence of symbols. Earlier, Elizabeth Bates (1979a; 1979b; 1979c) employed this metaphor throughout her work on the development of signs and pre-linguistic communication in young children.

where human meaning-making and symbolic thinking arises within the interrelations of culture and nature, within which culture is born, situated and tied, is foundational to the humanities. Moreover, human meaning-making is at once external, social, and culturally shared; and at the same time a process and a result of internal, individual understanding and interpretation. How to conceptualize culture within the individual mind? What is the nature of human meaning-making? What are the characteristics of the natural history of how humans specifically come to use signs? If culture is characterized by a specific kind of meaning-making, then how and under which conditions does it emerge within the child, and how does meaning-making develop over time, thus acquiring its characteristic cultural forms, coming to fulfil its various roles within the culture, which the child inhabits?

Some of the most prominent figures in the 20th century developmental psychology, such as Karl and Charlotte Bühler, Jean Piaget, and Lev Vygotsky, each recognized in their unique ways that children's mental and linguistic development – including related areas like practical behaviour, conceptual thinking, reasoning, problem-solving etc. – occurs through meaning-making as constituted within the processes of signs²³. To describe, understand, and model these processes⁴, these psychologists and many others employed existing semiotic terminology or at least partly developed their own, as a fully-developed semiotic vocabulary had not yet been established at the time they conducted their studies. These pioneering attempts were frequently overshadowed by the absence of a unified and comprehensive semiotic theory.

Among them, it is good to briefly discuss the works of Jean Piaget (1886–1980). A truly major figure in developmental cognitive psychology and structuralist theory, among his many significant contributions, he conceived of an elaborate account of the development of meaning-making in signs during early childhood (e.g., Piaget 1973 [1926]; Piaget, Inhelder 1977). He traced this development from early sensorimotor meaning-making through various stages, culminating in the formation of the “symbolic” or “semiotic function” around the second year of age. According to Piaget, “the semiotic function” encompasses

² Very recently, Sinha (2023) has given a broad historic account of the semiotic approaches to human development starting with the brief overview of the general lines of discussion of signs and thought in the philosophy of Aristotle, empiricism of Locke and Condillac, and the traditions of Leibniz and Kant. He then outlines the foundational roots of contemporary thinking on the subject of the development of signs, including the relationship of signs and thought in children in the works of the psychologists Karl Bühler, Jean Piaget, and Lev Vygotsky.

³ Bühler's various works would have made a good addition to the discussions presented in this thesis for a variety of reasons, not least for its functionalist approach and influence on the Prague school semiotics. Cf. also Innis's work (2016) for a brief comparison of Bühler's concept of signs with that of Charles Peirce and Ernst Cassirer, and for a good review of congruence between semiotics and developmentally oriented cultural psychology.

⁴ While there is a variety of theories and definitions of signs, they all tend to emphasize signs' processual nature, inherently valuable for developmentally oriented approaches to human psychology (Valsiner 2001).

ses and developmentally connects such various processes as mental representation, acquisition of language, emergence of imagination and conception, and other psychological phenomena with a semiotic component, such as drawing and symbolic play (e.g., Piaget, Inhelder 1977, cf. Krampen 1981)⁵, which all find their advent around the same time during the second year of age. For his developmentally adapted theory of signs, he synthesized psychoanalysis of Freud, linguist Ferdinand de Saussure's semiology (via Claparède), and the Peircean pragmatist semiotics of Charles Morris⁶, to analyse the progressive differentiation of cognitive expression and content within the child's mind.

To critically reflect on these approaches within developmental psychology from the point of view of the theory of semiotics, and perhaps to productively contribute back to developmental science, "developmental semiotics" as a distinct area of study was first suggested by Thomas Sebeok in 1977, and subsequently by Krampen (1981) and Daddesio (1995)⁷. Ontogeny of signs was explicitly the focus in the experimental works of the developmental psychologist Bates and her colleagues (1979). More recently, Lenninger (2012) has re-invigorated the term, and developmental semiotics, tasked with providing theories of how meaning-making and signs develop in children, can be exemplified by the works of Sonesson (e.g., 2006; Lenninger, Sinha, Sonesson 2015⁸); Zlatev (2009; Zlatev, Andren 2009), Sinha (2023), Moro and Rodriguez (2008; Rodríguez, Moreno-Llanos 2023), just to name a few. It is worth reminding that besides semiotics "proper" and developmental psychology, signs have been primary units of analysis in linguistics, and consequently in the study of language acquisition, at least since the seminal works by de Saussure in semiology⁹. Developmental semiotics has carried the promise of bridging all of these disciplines. While most semiotics is primarily theoretical and scholarly, developmental semiotics prides itself on involving experimental and observational research (cf. Violi 2007). However, the vast majority of developmental semiotics can be found rather in developmental and cultural psychology than as specifically semiotic.

⁵ Something akin to Piaget's "semiotic function" has been central to the evolutionary accounts by neuroscientists Donald (1991) and Deacon (1997); the former was directly transposed to ontogenesis by Nelson (2007).

⁶ A good critical comparison of Piaget's and Peirce's terminologies has been offered by Smith (1977).

⁷ Independently, Muller (1996) introduces the concept of "developmental semiotics" as a distinct area of study. Muller has an engaging account of Jacques Lacan's psychoanalytic theory of how signs develop in small children, with a hope of bringing it back closer to Peirce's semiotics. Over the years, Lacan's and Freud's approaches have become somewhat obscure and current accounts of semiotic development tend to ignore them, although both Freud and Lacan certainly used semiotic terminology.

⁸ Lenninger, Sinha, and Sonesson (2015) also provide a recent overview of the interrelations between developmental psychology and developmental semiotics.

⁹ Separately, the founding figure of sociolinguistics, Michael Halliday speaks of "meaning and the construction of reality in early childhood" (2004a [1974]), and representing the child as "a semiotic being", as "one who means" (2004b [1995]).

In Piaget's theory, signs and the semiotic function primarily play the role as cognitive structures for interacting with the surrounding physical environment. However, for this dissertation, the child's cultural development is of central importance. There is plenty of congruence of interests between semiotics and cultural psychology (cf. Valsiner 2000, 2001, 2019; Toomela 1996, 2003a, 2003b) and subsequent introductory chapters, as well as articles presented within this dissertation should certainly reflect that as well. From cultural psychology, this thesis adopts the idea that the human mind is inherently a social and cultural phenomenon. The semiotic understanding of signs adds to this idea the emphasis that children are not passive recipients of their cultural surroundings and language, but active meaning-makers. Symbols are individually created, but culturally shared. Symbolic thinking cannot emerge in isolation from culture. This dissertation thus explores the cultural origins of individual meaning-making as constituted in signs, and how children come to form and use signs characteristic of their cultures, or in other words, the semiotic development of the child.

While actively engaged with the surrounding cultural environment, the child's thinking itself is reflectively transformed. The focus of this thesis lies in the processes of how, interacting with culture, the child changes her or himself. In this dissertation, this interaction is termed as "autocommunication", drawing on the work of cultural semiotician Juri Lotman (e.g., 1990; cf. Linask 2023 in this dissertation).

This dissertation presents altogether five papers, which cover the development of meaning-making in young children from different, yet methodologically and historically broadly related perspectives. The subsequent chapters serve as an introduction and a commentary on these articles and functions as a map relating them on a cohesive surface in order to show the ways they are interrelated with each other, although they were written as separate articles fulfilling their own specific assignments. After the introduction, articles themselves are presented.

The first four are more theoretically oriented papers set to conceptualize signs and meaning-making within child development. The fifth is an application of these theories and conceptualizations in the study of a specific kind of auto-communicative speech that occurs in young children at about the time of formation of symbolic meaning-making, namely, crib speech. The first sets out to study meaning-making in nature, as it is understood in the theory of meaning by biologist Jakob von Uexküll, and finds an application of this theory in the observations conducted by developmental psychologist Martha Muchow.

The second and the third paper conceptualize semiotics in the works of psychologist Lev Vygotsky¹⁰, who is renowned for his cultural-historical approach. The papers emphasize the role of the concept of signs in his theory of

¹⁰ Martin Krampen deserves another mention at this point, as his work on conceptualizing a cohesive developmental theory of signs within the papers of Jean Piaget (Krampen 1981) constitutes as methodological inspiration for the work in this dissertation on the developmental semiotics found in the works of Lev Vygotsky and Roman Jakobson.

cultural development of the child, and present a systematized theory of the development of signs. In Vygotsky's theory, signs are shown to reflectively change the behaviour and thinking of the young child. These papers address how children meaningfully interact with their surrounding worlds, and how cultural environment becomes significant for them.

The fourth paper addresses developmental semiotics inherent in Roman Jakobson's communication model, while introducing the hierarchical organisation of how linguistic structures are formed during the development of the child's speech to accommodate interactions with other people, including how children come to use linguistic structures for reflection.

The fifth paper conceptualizes the child's communication with her or himself as autocommunication with the aid of Juri Lotman's concept of 'I-I' type communication. However, its main task is to systematically describe and explain a particular autocommunicative speech phenomenon occurring in the verbal behaviour of around two-year-olds, namely "crib speech", as a manifestation of the child's semiotic interaction with him or herself.

It is good to note that the order of the articles presented here does not follow the sequence of their publication, but methodological considerations. The sequence of articles in this thesis roughly follows two principles, or two common threads tying them together. Firstly, the approaches presented here are related conceptually, following in the direction of more general towards more particular, although the general model of communication in this thesis is not positioned entirely linearly in relation to this thread. Overall, what is presented in the first articles, make up as the principles or prerequisites that underlie the framework for what is investigated in the last, although each of the approaches introduces something additional on the general level of discussion as well, and conversely, each relies upon a specific set of applications, observations, and experimentations. Secondly, overall, they follow historical considerations from historically earlier towards the historically later, although this is somewhat accidental, and this thesis as a whole should not be taken as a single conceptual history, in which surely it would come up short for a variety of reasons.

Applying Jakob von Uexküll's concept of umwelt to human experience and development¹¹

The paper included as the first in this thesis introduces the developmental aspects of the theory of meaning by the biologist and an early predecessor of bio-semiotics, Jakob von Uexküll (1864–1944). These ideas are subsequently related to early ecological and environmental psychology, as found in the seminal studies by the psychologist Martha Muchow (1892–1933). The present paper was published as part of a collection edited by Günter Mey and Hartmut Günther in 2017, titled *The Life Space of the Urban Child: Perspectives on Martha Muchow's Classic Study*. This collection aimed to provide a contemporary reflection on Muchow's empirical studies of children's outdoor activities and their use of spontaneous playgrounds in the streets of 1930s Hamburg, Germany. The essay illustrates conceptual congruence between the approaches of Uexküll and Muchow, which both partly emerged at the same time at the then newly established University of Hamburg, although the instances they bring as examples for their theories are certainly very different.

Umwelt is the self-centred world of an organism, or the world as it is known or shaped by the organism (cf. Kull 2010; Magnus, Kull 2012). Uexküll distinguished two sides or aspects of umwelt: the perceptual world, which encompasses properties of objects in the umwelt that can be perceived with the sense organs, and the operational world, which includes cues that can be acted upon. These two sides of umwelt are united by the functional cycle, underscoring the idea that perceptual and operational worlds are ultimately interconnected within the sensorimotor system, contributing to the fulfilment of a need of the organism.

When Jakob von Uexküll developed the umwelt model, he was primarily interested in the diverse meaning relations that different kinds of organisms have within their environments. He also found it important to recognize that these meaning relations, and consequently the umwelt, are dynamic and change over time, as neither the organism nor its environment remains constant throughout the organism's lifespan. In the context of this dissertation, it raises the question, whether Uexküll's concepts can be applied to describe the development of the specifically human umwelt? Muchow's work is demonstrated as an application of these ideas, with her findings interpreted through the lens of Uexküll's notions of umwelt and the functional cycle.

In 1926, Uexküll established the Institute for Umwelt Research at the University of Hamburg, where the research was centered on the sensory biology

¹¹ This essay was published co-authored as Linask, Lauri; Magnus, Riin; Kull, Kalevi 2017. Applying Jakob von Uexküll's concept of umwelt to human experience and development. In: Mey, Günter; Günther, Hartmut (eds.). *The Life Space of the Urban Child: Perspectives on Martha Muchow's Classic Study*. New York: Routledge, 177–194. Although all authors contributed to the paper, the author of this thesis was primarily responsible for the sections 'Umwelt Dynamics in Human and Non-Human Ontogeny' and 'Conclusions'. The introduction presented here also emphasizes these parts of the essay.

and behavior of various animal species, as well as the meaningful objects of their activities. Concurrently, until 1933, the University of Hamburg's Institute of Psychology was home to renowned figures like William Stern and Heinz Werner, as well as to Martha Muchow, who is perhaps lesser-known.

In the early 1930s, as a junior member at the Institute, Martha Muchow conducted a series of observations of what she called *The Life Space of the Urban Child*, posthumously commented on and published by his brother Hans Heinrich in 1935 (Muchow, Muchow 2017 [1935]). The objective was to characterize what Muchow referred to as children's "lifeworlds" – the subjective environments in which the children "actually" live. Similar to how Uexküll used specific examples to relate environmental characteristics to behaviours and building plans of various organisms as constituting their *umwelten*, Muchow correlated environmental features with the behaviours of children at different ages, specifically contrasting the children's perceived environment with the physical environment. She also delineated the children's lifeworlds on the bases of how their life spaces – the environments they inhabit – differ from those of adults. Muchow's concept of the lifeworld can thus be considered broadly analogous to Uexküll's concept of *umwelt*, although she explicitly referred to Uexküll's work only briefly. For understanding the aims of the essay presented in the thesis, a short introduction to Muchow's (Muchow, Muchow 2017 [1935]) study might be useful.

The study focused on children aged 5 to 14, primarily residing in the working-class district of Barmbek in Hamburg. Initially, Muchow outlined the general characteristics of the children's urban environment in Barmbek, making use of maps to highlight main thoroughfares with heavy traffic, secondary streets with lighter traffic, routes leading to significant locations such as bridges over the canals or to the shopping mall, playgrounds, and the docking areas near the canals, which the children often attended. This aimed to capture and depict the space within which the urban child lives – the shared physical environment.

Subsequently, the children were asked to describe the places they used in the district. Muchow tried to get answers to questions such as, what were their activities on their walks and how they themselves perceived them, what were more significant places, where did they play and when, how much time did they spend at certain places compared to others, etc. Again, according to children's own accounts, their various activities were related to distinct age groups, as well as genders.

After conducting interviews with children to understand the urban environment from their points of view, the children's movement within the district was mapped and described. This exercise aimed to precisely identify where children of different ages play and explore, covering characteristics that differentiate their spaces from those of adults. While adults typically stuck to familiar routes for commuting between home, work, and the mall, children's roaming areas proved to be more varied in distance, locations, and streets used. By analysing the collected maps, children were categorized into age groups based on the complexity and size of their roaming areas, which also showed gender-specific trends in certain parts of the district.

Then, observation posts were set up in the district of Barmbek at the specific places, where children liked to attend and play: a loading dock area at the Osterbeck channel, a vacant lot in the neighbourhood, and a playground with a set of attractions, such as climbing-trees, swings, sandboxes etc. The observations began by describing the specific structure, characteristics, objects, and boundaries of these places. The behaviour of both children and adults in relation to these objects was closely described, often focusing on specific movements and gestures. Within the same areas, adults and children interacted with certain objects in very different ways. Objects were analysed based on their usage by children of varying ages and the level of attention they received from both children and adults.

Three *stages* of development can be drawn in human ontogeny, after Jakob von Uexküll's (e.g., 1982 [1940]) work, based on the type of meaning-making they involve: the *pre-representational umwelt* stage central to meaning-making in the embryonic stage, wherein "meaning factors" are dependent on the organism's building plan; the stage of *umwelt* of meaning carriers or objects, which relate the subject to its environment by the functional cycle, implying a nervous system; and the stage of the observer with an *umwelt* of neutral objects, which are independent of subjective relations – perhaps, characteristic of abstract conceptual thought. Of course, there is no reason why these very broad stages cannot be analysed further into sub-stages. For example, Thure von Uexküll (1986) has proposed a synthesis of Jakob von Uexküll's and Jean Piaget's stages of sensorimotor and symbolic or semiotic function. It is clear that as different organisms have varying meaning relations with their environments, so does organisms' *umwelten* change over the course of their ontogeny.

The paper included in the thesis argues that these three stages correspond to the three *levels* or kinds of meaning-making within the mature human being. Firstly, meaning factors are relevant throughout the entire life courses of all living organisms to the extent that the building plan of the organic body must complement the cues within the surrounding environment, e.g., the joints of legs for walking, the structure of the hands for grasping. Muchow, as an early ecological psychologist, observes a variety of ways how both children and grown-ups are functionally fit within their physical environments, and how their specific activities are dependent on the structures of their morphological features. Humans, as well as other organisms, sometimes carve out their environments in meaningful ways to complement their building plans.

Secondly, a greater plasticity and flexibility of *umwelt* relations is evident in organisms with more complex nervous systems, which organize their sensorimotor processes. *Umwelten* of all animals are inherently dependent on the complexity and characteristics of their nervous systems, and humans are specifically characterized by the plasticity of their brain substance. While building plans of children and adult humans vary to a degree in size and the proportions of organs and body parts to each other, the differences in the way they perceive and affect their environments mostly lie in the way their *umwelt* relationships are organized as a result of learning. According to Uexküll's theory, nervous systems

enable forming meaning relations on a level of higher complexity of organization, compared to that of meaning factors.

According to Uexküll, human-specific meaning-making occurs when an observer forms relations with what he terms “neutral objects”. These objects, detached from the subject-object perception-operation cycles, become meaning-carriers only once they enter into a relationship with a subject. Objective depictions of the physical world rely on these neutral objects as they lack specific associations with any single subject. Consequently, they serve as the observer’s “uniform standard measure” for understanding the varied relationships that different animals maintain within their environments. Uexküll posits that other animals, unlike humans, are not observers in this sense; instead, their *umwelten* consist of objects tailored to their specific physical environments, where certain qualities of these objects are deemed essential, while others are secondary. For Martha Muchow, the concept of the observer’s uniform standard measure is adapted in the creation of maps and structural descriptions of environments, based on generalizations of children’s descriptions, and serving as a basis for comparing the lifeworlds of children and adults.

Martha Muchow’s examination of the life space of the urban child was influenced by Jakob von Uexküll’s *umwelt* model, and may be taken as an application of this model to human development. Through her observations, Muchow found that urban dwellers, while sharing the physical environment of the city, construct their own city, or lifeworlds, tailored to their individual needs and interests. She observed that each individual experiences the city differently, according to such factors as the “size, intensity, and accentuation” (Muchow, Muchow 2017 [1935]: 141–142). Muchow demonstrated that the perception of the city varies depending on the age and structural characteristics of the inhabitants, and showed how children and adults construct different life spaces, thereby linking Uexküll’s *umwelt* model to a developmental perspective in human beings.

This essay also exemplifies the potential of including the concept of *umwelt* within the studies of urban dwelling, as it provides for productive inclusion of points of views or perspectives of various different inhabitants of urban environments – in the variety of species, as well as in the variety of ages of the dwellers.

In the context of this thesis as a whole, this text perhaps lies further apart from the other included papers. However, Uexküll’s approach is fundamentally developmental, emphasizing the significance of changes in organisms’ meaning relations taking place over time during ontogeny. Therefore, Uexküll’s theories provide for the broadest and most general framework for describing the changes that take place within an organism’s *umwelt*. Moreover, Uexküll’s approach is inherently processual, as it conceptualizes the functional cycle that connects the sensory and the motor part within the organisation of meaning-making without reducing these processes into mechanistic or behaviouristic simplifications. In these foundational aspects, Uexküll’s theory of meaning provides for this thesis groundwork for subsequent studies on the development of meaning-making in young children, and consequently, the changes within their *umwelten*.

Is the Vygotskian Perspective Suitable for Describing the Development of Signs?¹²

The second paper in this thesis delves into the theory of signs as developed in the works of the developmental psychologist Lev Vygotsky (1896–1934), which are closely associated with cultural-historical psychology and cultural psychology more broadly nowadays. Positioned as both an introduction and addendum to the third paper, *Vygotsky's natural history of signs* (Linask 2019), introduced in the subsequent section, it aims to illustrate the relevance of Vygotsky's theories to the dissertation as a whole. Its primary objective is to conceptualize Vygotsky's account of the formation of symbol use in small children as what in semiotics is called “the symbolic threshold”.

While the concept of signs was central to Vygotsky's works, developmental psychology has historically often neglected its significance for his other concepts or even attempted to exclude it from analyses altogether. This is the case in some forms of what has been called “the activity theory” (Toomela 2000), which also traces its roots in Vygotsky's approach. Also Michael Cole, a major figure in cultural psychology, simply substitutes Vygotsky's “signs” with “artefacts” in his foundational book *Cultural Psychology: A once and future discipline* (1996). It is also noteworthy that Vygotsky's approach has only relatively recently gained wider recognition and relevance in semiotics¹³, however, this thesis certainly hopes to demonstrate how much more it has to contribute. Critically examining his theories of signs in relation to other foundational theories, such as those proposed by Ferdinand de Saussure (e.g., Bronckart 2022) or Charles Sanders Peirce (e.g., Barnham 2022¹⁴, West 2021), remains a largely provisional and ongoing endeavour¹⁵.

¹² Published as: Linask, Lauri 2012. Is the Vygotskian Perspective Suitable for Describing the Development of Signs? *Rivista Italiana di Filosofia del Linguaggio*, 6(2), 202–209. This paper does not meet the formal requirements for a doctoral thesis, but it is not considered a mandatory component for fulfilling them.

¹³ One of central figures in Tartu-Moscow school of semiotics, Vyacheslav Ivanov (2014) has relatively recently argued that Vygotsky's studies should be taken as an early original contribution to semiotic theory, as well as contextualized Vygotsky's “cultural-historical” approach in terms of cultural semiotics. Ivanov is also one of few to stress Vygotsky's role as a significant predecessor of cultural semiotics of the Tartu-Moscow school. Earlier, he has suggested that the understanding of the development and the dynamics of culture among Tartu-Moscow school semioticians principally finds its origins Vygotsky's works (Ivanov 1983).

¹⁴ Chris Barnham, in a recent book titled *The Natural History of the Sign: Peirce, Vygotsky and the Hegelian Model of Concept Formation* (2022) (a title somewhat similar to that of one of the articles presented in this dissertation, Linask 2019) suggests a connection between Peirce's semiotics and Vygotsky's psychology by way of their shared roots in the philosophy of Hegel. Although Peirce's conception of “sign” and Hegel's “concept” are often contrasted (Peirce himself having articulated some of the differences), there is plenty of common ground between the two. Barnham argues that Peirce had less incentive to explain the positions which he and Hegel agreed upon in the generally Hegelian atmosphere of the late 19th century US philosophy. Vygotsky, in his studies of the development of concepts during

The task of this paper is to shed light on the multifaceted role that the concept of signs plays in Vygotsky's theories. While the third paper provides a detailed and organized account of the concept of signs in Vygotsky's works, this paper offers an outline of the role signs serve at the intersection of various processes within specifically human psychology and culture.

To explain how thinking of children forms and develops in such a way that they become members of their surrounding cultures, Vygotsky employed signs as the primary unit of psychological analyses. According to Vygotsky, signs – particularly linguistic signs, or symbols such as words and in speech, although Vygotsky also examined numbers, diagrams, drawing, maps, and various other signs and sign systems mostly involving a conventional, cultural component – serve as means and mediators for organizing human behaviour, including thinking.

According to Vygotsky, symbol use, or “the symbolic activity”, marks the distinctive behaviours specific to *Homo sapiens* (Vygotsky drew his conclusions on the studies of chimpanzees by Wolfgang Köhler), explaining the radical differences between the species in the ways they behave within their natural habitats. Therefore, symbolic activity delineates the evolutionary, phylogenetic threshold for behaviours commonly recognized as cultural. At this juncture, it is crucial to recognize two distinct yet interconnected levels of analyses, which are thereby brought together. On the one hand, symbol use is culturally specific and varied, while symbol systems are usually shared within communities. Symbolic meaning-making is often studied on the level of culture as a social or socio-cultural phenomenon.

However, as Vygotsky points out, symbolic meaning-making also operates at the individual level as a behavioural phenomenon, as individual members of cultures create meaning, representing and interacting within their environments. Consequently, symbol use, and all that it entails (cf. detailed account in Linask 2019), bridges the levels of culture and the individual without reducing the significance of one for another, thereby providing cognitive grounding for culture, as well as engaging individual meaning-making culturally. Nowadays, we might say that both culture and human thinking is in essential characteristics constituted in, and manifests as discourse, in the broad, semiotic use of the term. However, it does not mean reducing it solely to discourse either, according to Vygotsky's theoretical framework (cf. Linask 2019).

On the other hand, symbol use and cultural meaning-making are not available for humans since birth, but as a result of cultural learning within the society (itself species specific to humans, naturally). Acquisition of the use of linguistic

childhood, seeks to explain it with the help of semiotic analyses of symbolic signs. Barnham argues that Peirce's classification of signs was conceived of as serving to overcome the limitations and shortcomings of Hegelian understanding of the development of concepts, thus, “signs” for “concepts”.

¹⁵ In fact, in several ways (besides the dialogue and debate with behaviourism in psychology), his approach is akin to that of pragmatism of Charles Morris (e.g., 1946).

signs, especially the use of speech, along with other sign systems, gives children access to the cultures they inhabit.

According to Vygotsky, symbols are not simply inherited from preceding generations, nor are they invented by children. Vygotsky's theory helps to explain how, rather, symbols and symbol use as means for interaction with the other members of the culture, as well as with oneself, forms or emerges over a series of transitions, during which the child's "natural" or "organic" meaning-making is culturally and psychologically transformed. Consequently, symbols mediate between the social and intellectual processes. As a result of this process, environment itself becomes culturally significant, while cultural environment becomes meaningful cognitively, for the child. Thus, signs not only grow to mediate between culture and the individual, but also between the individual and their environment, including the individual him or herself. This very juncture – the ontogeny of the symbolic threshold at the point of which the child becomes symbol-minded – is the central topic of attention in all subsequent papers in this thesis, as grounded within explanations provided by Vygotsky's broad theoretical position.

Moreover, to explain how these developmental changes in human thinking take place over time during the course of ontogeny, Vygotsky's approach helps to ground the formation of symbolic signs within the very processes of those interactions themselves, in which the young developing child is engaged. Symbols are not simply mechanically added to behaviours. Rather, symbolic thinking is the result of active (re-)organization of the relationship between the child and environment (which includes culture and the child herself). Symbols transform the natural organization of the child's psychological functioning by reorganizing it on a higher level, that of culturally shared meanings. Vygotsky's analyses of this processual (microgenetic) aspect of the symbolic threshold – the act of giving meaning and psychologically engaging with the environment – provide means of demonstrating how various psychological functions, such as perception, memory, attention, practical, or natural thinking etc., are reorganized in relation to each other through the formation of symbols (e.g., the inclusion of speech within these processes, as the use of speech itself gradually forms as symbolic activity). Symbols mediate the organization of various psychological processes in relation to each other.

Thus, Vygotsky's theory provides an account of how small children acquire the use of linguistic signs within a language system, gaining access to culture in the process. It is also an account of cultural thinking as constituted by symbolic signs, and of development of these signs. In Vygotsky's theory, symbols as units of analysis integrate culture, language, and the psychological formation of the child's mind. And lastly, no less foundationally, especially for semiotics as an evolving science, it is a perspective based on observation and experimentation for studying how children learn to meaningfully act in culture.

Vygotsky's natural history of signs¹⁶

The third paper in this thesis compiles and arranges Lev Vygotsky's various writings on signs to provide a comprehensive and cohesive account of his theory. While the paper presented in this thesis certainly is neither the first nor the only one to suggest it, Vygotsky's analysis of children's cultural development is semiotic at its very foundations. Vygotsky conceptualized cultural development, characteristic specifically to humans, in terms of the development of behaviour, including thinking and practical behaviour or activity, with the aid of socio-culturally shared signs. Broadly, Vygotsky's work presents, on the one hand, an account of the acquisition or formation of sign use and the symbolic activity, and on the other, an account of the changes that take place within signs as units of thinking during this process.

At the time of Vygotsky's writings during the late 1920s and early 1930s, semiotics as a theory or theories explaining the role of signs in meaning-making had not properly formed as of yet as an independent field of scholarship, although the use of semiotic concepts was of course widespread, connecting various areas of study. Vygotsky employed these concepts in diverse ways, elaborating them for his own purposes to explain changes in interrelations of natural, or organic development, and cultural development, that take place in meaning-making during childhood. Although he was very productive, Vygotsky died very young, only at the age of 37, and he did not leave behind a finished system of thought. As a result, his papers, often available in the form of unpublished manuscripts, particularly when read separately, present a fragmented picture of child development. For the same reason, they present a fragmented account of his theory of signs, which has resulted in major misrepresentations and misinterpretations over the years, in semiotics and developmental psychology alike, which have relied on unsuitable sources.

This paper aims to fix this shortcoming and demonstrate that not only is Vygotsky's approach inherently semiotic, but a comprehensive and cohesive theory of signs can be reconstructed by gathering his semiotic notions from his papers and by clarifying the relationships between these notions. Even nowadays, developmental psychology has only partially acknowledged the importance of a coherent theory of signs as its integral part, whereas semiotics and linguistics lack a full understanding of the psychological processes underpinning meaning-making in humans. Vygotsky's theory stands as a valuable contribution to the theories of signs in general and it is indispensable for explaining changes that take place during the development of meaning-making in human children up to date. Over the years, there has been a variety of scholarship on Vygotsky, but much of it has been poorly informed about his theories of signs. As a result, this scholarship has largely overlooked the central role that the topic of signs played in Vygotsky's theoretical framework.

¹⁶ Published as: Linask, Lauri 2019. Vygotsky's natural history of signs. *Sign Systems Studies* 47(1/2), 257–304.

The use of sources on the topic of signs in Vygotsky's works must also be clarified. Firstly, English-language translations of Vygotsky's work have been notably problematic over the years, including the parts regarding semiotic terminology, despite several attempts at translations. Secondly, significant concerns arise with the original works themselves, as they were largely not adequately published until the late 1980s. The paper (Linask 2019: 259–261) provides an overview of the most reliable English-language sources regarding signs in Vygotsky's works, along with an overview of secondary commentary.

Vygotsky conducted his research and experimentation in dialogue with the contemporary intellectual climate. He argued that reducing thinking and cultural behaviour characteristic of human beings to elementary connections of stimulus-response, as proposed by behaviourism, would not suffice to explain the differences in behaviours among different species, nor account for the origins of behaviours, or their development within human beings' active and purposeful interactions with the environment, other people, and themselves. Vygotsky also suggested that the linguistic sign, often viewed as a purely abstract relationship, mechanically set as a means of communication with other people, actually facilitates thinking and other intellectual activities in interaction with the surrounding socially shared cultural environment as constituent part of the overall psychological behaviour. Vygotsky's contribution lies in not treating speech separately from the system of activities in which the child is involved, but rather as one psychological function among others.

He suggested that while *Homo sapiens* largely share most elementary, or "lower", psychological functions like perception, selection, memory, concept formation, and problem solving with other kindred species, human-specific behaviours emerge once speech and these elementary psychological functions are integrated into one single system of activities, giving rise to psychological functions of "higher" organization. Initially serving mainly a communicative function, speech evolves to also serve intellectual and cognitive functions, paving the way for qualitatively new kinds of behaviours that distinguish humans from other closely related species. Moreover, Vygotsky explains the developmental changes leading to children adopting the means and ways of meaning-making characteristic of their surrounding cultures. In humans, cultural development is normal development. He suggested that the higher functions emerge as new structural entities as a new stage of development of the system of lower functions. This process of integration of cultural means within individual thinking and behaviour, taking place as a series of lawful transitions and transformations, is in other words, formation of symbolic behaviour, symbolic activity, or symbolic thinking, depending on the context. Vygotsky calls these developmental steps "the natural history of signs" (Vygotsky, Luria 1994: 148–151; Vygotsky 1994 [1929]: 62).

Every elementary behaviour, e.g., an association or conditional reflexive connection, involves a situation at hand, forming within the mind, as a psychological function, a stimulus, and a memorised response. A sign operation brings into this elementary behaviour an intermediate link, which can be a word or

really any other kind of external auxiliary aid (possibly a differentiated part of the situation or the behaviour itself), creating two new connections – one with the stimulus and one with the response. Each connection functions as a separate conditioned response cycle within the cerebral cortex. However, as to the initial situation, instead of one connection, there is now two (three, if the original is included or involved), and the structural construction and the combination of nerve connections is new. The structure of the behaviour as a whole is new – it has become differentiated –, as a functional barrier is introduced within the overall cycle, with this barrier directed within the mind itself, rather than towards the situation at hand, or towards the response.

Thus, the sign – as the intermediate link, forms as an independent structure in the symbolic activity to substitute either the situation at hand, or the response, or both. As a result, the symbolic organization of activity enables relative freedom of responses from the situation *hic et nunc*, and thus, eventually, planning and control of one's own behaviours. Vygotsky brings multiple examples of these processes, e.g., the formation of young child's pointing gesture; however, the most significant in terms of the development of thinking probably is the formation of words and speech. Symbols, which are otherwise products of cultural history, thus come to be used to reorganize one's own behaviours and responses. Parts of brain that develop along with the acquisition of speech come to organize functioning of the parts associated with the other psychological functions.

Particularly in his earlier writings, Vygotsky viewed signs as psychological tools for thinking, akin to physical tools used to manipulate the external environment. For that reason, taking Vygotsky's theory of signs as instrumentalist has been one of the main sources of misrepresentation both in semiotics and psychology. Signs, like tools, are instrumental in problem-solving tasks and indeed mediate purposeful activities between individuals and their surroundings. However, he explicitly cautioned against overextending this metaphor, arguing that while both are artificial devices, they serve distinct functions. In fact, it is the advantage of signs that they influence intellectual operations without physical alteration, not the object directly. Cognitively, this enables them to tend to objects absent from the immediate present of the situation, and seek and prepare stimuli, which only then can be applied in problem solving, planning for the future and organising thought, including sharing thoughts with other people. Mediating generalized thought, symbols are not determined by specific objects, although they can be tools sometimes. Furthermore, he asserted that the development of sign use reflects broader patterns of cognitive evolution, with the laws governing practical intelligence serving only as a specific instance of the general principles guiding higher psychological functions.

Vygotsky analysed the convergence of communicative speech as a higher cognitive function with all the lower functions – practical thinking and activity, natural forms of perception, selection, attention, memory etc. – to show how these functions transform in the process into higher or cultural forms. In fact, according to Vygotsky, at the start of this convergence, communicative behaviour also is not a higher function, and of course not restricted to *Homo*

sapiens at all. However, he proposed that the actual convergence of communicative speech with practical thinking and other functions is a distinctive feature of human development. This convergence is another aspect of the process of symbol formation.

For Vygotsky, words and also other things become signs (as structures) functionally. He gives an account of the development of signs use, which in its principles actually complements Roman Jakobson's linguistic account, which has been conceptualised in the fourth paper of this thesis (Linask 2018), and introduced in the subsequent section. Jakobson does not explicitly rely on Vygotsky at this particular point, however.

Initially, the child's vocal behaviour evolves from reflexive responses to conditioned reactions (not too differently from other gestures), gradually integrating with other motor responses to form complex behaviours: first communicative acts are "emotional", whereas within interactions with caregivers, specific acts become differentiated to maintain social contact for seeking attention and care. As speech gradually becomes central to communicative interactions, social contact further shapes the development of vocalization into functional speech. An important step in the process is the differentiation of word meanings in relation to their vocalized expression, as they first acquire an indicative function in reference to external objects, and further, gradually, not so much as these objects appear or occur *hic et nunc*, but as to their generalized experience. Children initially associate words with specific objects before grasping the structural unity between words and their meanings as generalized concepts shared within social contexts – i.e., their symbolic nature. This is the transition from external behaviours to internalized concepts at the symbolic threshold, in effect, intellectualization of external communication.

Acquiring language and formation of symbols profoundly changes how cognitive processes are organized within the mind of a person as a system of interrelated functions as a whole, rather than merely altering individual functions. In the article, these processes are systematically analysed and illustrated, but essentially, convergence of sign use and other psychological functions, such as perception, selection, attention, memory etc. reorganizes all aspects of human behaviour in relation to each other.

For example, perception, while organically differentiated already in its natural forms, initially functions as an integral sensory whole. According to Vygotsky, as syntactic structures are formed, speech analytically introduces and enables within the sensory field indication, selection, ordering and arrangement, and joining of elements together – in essence, purposeful operations of analytic differentiation, as well as synthesis. At early stages of sign use, in order to deal with an object, the small child needs a variety of complementary bodily movements to accompany handling of objects within the practical sphere of activities (pointing, turning, gesturing etc.) – to compensate for lack of verbal development, in order to communicate distinct characteristics of the perceived environment. As speech becomes intellectualized during formation and organization of linguistic structures, the child gradually becomes less reliant on external en-

vironment for representing and arranging the relationships within the perceptual field.

The use of signs and words helps the child to distinguish objects from their environment, focusing attention. Indication with the help of signs enables the child to single out and distinguish concrete single objects within the sensory situation. Naming the toy, as an early form of reference, enables the child to focus the situation for the parents. Using words, adults guide the attention of the child at some cultural objects and to disregard others. Over time, words themselves become centres of the perceptual structure, organising the natural structure of the situation around their meanings. Thus, perception no longer serves merely as an observation of a shape or colour – not as isolated, but as categorized. In a way, humans perceive through the lens of speech. As a result, the child comes to be able to infer from the environment without having to resort to senses only.

In the beginning, the child's cognitive selection within sensory situations is undifferentiated and constrained by available motor responses. Creating a sign relationship between the stimulus and the corresponding symbol, as an organized form of selection, introduces a functional barrier within the sensorimotor cycle¹⁷. While in the beginning the concrete experience of an object dominates its cognitive selection, slowly, the generalized concept starts to dominate over the process, and selection is turned around from as to the point of view of its outcomes. With the motor responses differentiating from the sensory processes, the direct response is inhibited, and intellectual life as an independent psychological function emerges. While at first, attention is entirely determined by the sensory field and the particular disposition of the child's current interests, words and speech function to bring to the fore certain aspects of the sensory field, disregard others, and combine aspects of the sensory field to produce deferred responses. While in the beginning, the child's attention is guided by the object, the child comes to guide her own attention conceptually.

While memory is available for the small child as an unsystematised, unmediated expression of experience already as constituted in conditioned sensorimotor cycles, over the course of development, symbols are included within these responses, coming to substitute things, situations and other objects external to the situational present, as well as providing for categorized comprehension¹⁸. In fact, according to Vygotsky, cultural development brings the greatest changes to the functioning of memory, compared to other functions.

¹⁷ This approach accords with Cassirer's (1944) suggestions regarding the human-specific *umwelt*, providing a developmental account of its formation, although Cassirer was rather on the view that the formation of understanding of signs takes place as a sudden discovery, while according to Vygotsky, it is a developmental process including several steps. Vygotsky's approach and Uexküll's model of the functional cycle have not been synthesized up to date.

¹⁸ The significance of the difference of an occurrence as it happens in meaning-making here-and-now, as compared to conceptualization within the memory, has been elaborated in semiotic terms by van Heusden (2009), in the context of evolution of human cultural meaning-making. van Heusden also sees signs as cognitive structures, similar to Vygotsky, and the approach taken in this dissertation.

According to Vygotsky, in many ways, culture functions as a system of memory, providing for individual functioning of a person, among other psychological functions that it mediates, which again should not mean reducing culture into memory. Various sign systems are passed down and developed over the course of the cultural history. Language itself, as well as writing, functions as a mnemotechnical tool for organizing interrelations of other psychological functions, as well as the relationship between the person and the environment. In relation to the perception of time, moments of the past are interpreted as to their relationship to the present, while their selection enables setting up potential future states of the sensory field, sometimes forming as narratives. Combining elements of the sensory field of both its past, present, and future states gives ground to the creative organization of the cultural memory and enables organisation of practical behaviour from the point of view of its potential outcomes. Creative organization of daily experiences by linguistic means in terms of memory as a discursive phenomenon also becomes relevant in the analyses of crib speech in the final paper of this thesis.

Vygotsky's approach offers the potential of relating the individual and cultural levels of functioning of memory. Vygotsky's concept of "cultural memory" promises to provide cognitive grounding for current understanding of cultural memory and in terms of functioning of individual memory within sociocultural settings, it appears well compatible with Juri Lotman's approach to "cultural memory" set on the level of culture as a whole. Both approaches include study of memory as a discursive phenomenon. However, bringing these approaches together remains a future task.

Already these brief sketches should illustrate the underlying idea in Vygotsky's analyses of processes of changing interrelations of various psychological functions, as they become intertwined with socially shared signs during language acquisition, culturally transforming the behaviour of the child onto the level of cultural meaning-making.

One of the most important concepts in Vygotsky's theory is "internalization". This concept has been of essential value also for this thesis, particularly in the last article, the study of crib speech. It is crucial to Vygotsky's analyses of cultural development that the formation of every higher psychological function begins in the social, communicative sphere with external means. In brief, internalization is the process in which speech and practical activity are intertwined, leading to the control of one's own behaviour, reorganization of behaviour with the aid of symbols. Vygotsky introduces the idea that the human mind is both a subject and its own object. In this process, an external behaviour is turned internal, or "intra-psychological". One of the most important results of this process is the differentiation of internal thinking as an independent psychological function, taking place exclusively as symbolic.

According to Vygotsky, the process of internalization, which has been in essence already introduced as to its consequences within interrelations of psychological functions, is observable in the development of speech, particularly as to speech's functioning in the external sphere of practical activity.

While early communicative behaviour involves children turning to parents for help, increasing in case of need, slowly, speech develops as means of reflection for solving the problem at hand by oneself, on one's own, without external assistance. Speech enables bringing the thought on the thought process itself – reorganizing the psychological functions reflectively. According to Vygotsky, as a result, a distinct form of speech differentiates from communicative speech with others, in order to attend to the child's own personal needs. Rather than serving communicative purposes, this type of speech serves specifically cognitive, reflexive, intellectual functions. He calls this speech genre “egocentric speech” after Piaget, but it is usually called “private speech” nowadays, which is unfortunate, because as it should be clear already from this introduction, there is really nothing private about it. It manifests audibly between ages 3 to 7 as children's self-talk, often occurring during play or solving some sort of a problem (during reading, drawing, writing etc.). While in the beginning, it resembles social talk, over time, its characteristic features are gradually distinguished, until it is turned fully inside, intellectualized as “inner speech”¹⁹, as a distinct plane of verbal thought within the structures of internal thought (which does not mean reducing thought to inner speech). This process is carefully reviewed in the paper.

For Vygotsky, all sign operations are inherently formed to regulate, reorganize one's own behaviour – they are at least partly directed towards oneself. Sign relations are formed by including into psychological operations external, communicative means, which are acquired by social interactions. Therefore, it can be generalized that processes of internalization, intellectualization of behaviour, are inherently “autocommunicative” – they arise within communication with oneself. This idea will be clarified in the subsequent papers.

Finally, in the paper on Vygotsky's “natural history of signs”, an account is given of the cultural development of concepts in children. Culturally shared symbols structurally change psychological functioning as its constituents. However, for Vygotsky, changes take place in the psychological functioning of these symbols themselves during this process. For Vygotsky, the unit of analyses was the internal part of the symbol, e.g., the word –, the “meaning”, or the “word meaning”. The main characteristic of words is that they do not refer to single objects, but to a group or class of objects, while formation of these groups or classes changes in the process of their adoption into thinking. This characteristic of words does not arise in usage suddenly, but is itself a result of several stages of transitions, starting from early use of words to everyday concepts up until the use of abstract concepts, which develops during schooling by teen ages. While the young child's thinking is highly contextualized and concrete at first within the situation in which thinking occurs, over time it becomes free and voluntary,

¹⁹ Recently, Fadeev (2022) has argued for adopting Vygotsky's concept of inner speech to studying digital literacies and suggests that semiotic analysis has a lot to contribute to contemporary psychology in terms of how inner speech is conceptualized.

and then further, complex and organized, as the use of abstract concepts forms, e.g., during the acquisition of the use of mathematical concepts.

In conclusion, Vygotsky's approach, which is both developmental and processual, proves valuable as a theory that integrates the acquisition of speech with the psychological functioning of human beings through the introduction of the concept of signs. Within the fields of semiotics, developmental psychology, and psycholinguistics, Vygotsky's concept of signs, as well as his analyses of the formation of sign use, have been undeservedly marginalized. Nevertheless, his theory provides an account for the social aspects of the formation of individual minds and offers a cognitive foundation for the functioning of cultures²⁰.

²⁰ In various papers, Aaro Toomela (1996, 2003a, including his doctoral dissertation of 2000) has brought together Vygotsky's concept of symbols and Juri Lotman's concept of "semiosphere" in order to delineate the role of culture in culture-individual relationships. As a neurologist and developmentally oriented cultural psychologist, he also relies on Lotman's analyses, more inclined towards general semiotics in this matter, on how novelty emerges in the creative mind. Relating to this thesis, Toomela's (2016) broad framework (almost an independent system of thought on its own) includes both Uexküll's concept of *umwelt* as well as Vygotsky's account of interrelations of conventional signs and thought, although he does not discuss a direct connection of these approaches. Based on Vygotsky's original writings, as well as recent research on the ontogeny of the human brain, Toomela (2003b, 2016, 2017) has outlined a developmental account of signs that can be considered as an alternative to that of Deacon (1997).

Differentiation of language functions during language acquisition based on Roman Jakobson's communication model²¹

The fourth paper included in this thesis takes a new look at linguist Roman Jakobson's (1896–1982) famous communication functions, albeit from the point of view of the development of communication in children – a perspective much less acknowledged and realized. As to early language acquisition, Jakobson's original contribution is primarily known for his account of structural differentiation of phonemes (see for example Krampen 1986a). The study of functional changes that occur in the ways children communicate in relation to his communication model has attracted less attention over the years. Although there were other early followers (covered in this thesis, Weir 1962, Bates *et al.* 1979), Bruner's (1975) and Silverstein's work (e.g., 1985) may be brought out as more influential for broader semiotics, yet not necessarily for this specific application.

The paper included in this thesis compiles and organizes Jakobson's suggestions on the ontogeny of speech functions from a large selection of writings (cf. Linask 2018 for precise sources). It focuses on the topic of step-by-step differentiation and formation of linguistic structures in children's language during first language acquisition. The paper explores the correspondence of these emergent structures to various specific or distinct uses of communicative acts, or “functions”, in Jakobson's (e.g., 1971 [1962]; 1985 [1976]) terms. These specific uses of language subsequently become available for the child as a result of formation of linguistic structures.

Bringing together Karl Bühler's communication model and that of Shannon and Weaver, along with incorporating influences from others, Jakobson outlines the basic constituent factors inherent in every communicative situation, underlying any message transmission. In semiotics, these factors are widely recognized: the addresser and addressee; the contact or channel that is used to transmit the message; the context, which is referred to within the communicative act; the code, which has been used to articulate and structure the message; and of course, the communicative message itself. Accordingly, these six factors determine the six functions or tasks that any message fulfills in a communicative situation – emotive, conative, phatic, referential, metalingual, and poetic.

In the paper presented in this thesis, it is asserted that “the function of each factor is its correlation with other factors and with the constructional principle of the whole [of the message]” (Linask 2018: 519). However, it should be clear that Jakobson has not explicitly defined the term in this manner, and it could be argued that this formulation aligns more closely with the writings of Tynyanov (cf. O'Toole and Shukman 1977: 32–33). A more accurate statement might be that for Jakobson, each “function” signifies the set or orientation (*Einstellung*)

²¹ Published as: Linask, Lauri 2018. Differentiation of language functions during language acquisition based on Roman Jakobson's communication model. *Sign Systems Studies* 46 (4), 517–537.

of the message toward a particular factor – a formulation also adopted in the paper.

All linguistic structures present in a message can be functionally linked to the basic factors of the communicative situation, as they are set to fulfill a purpose or task. Thus, “functions” are derived from the relationships between factors within the situation as a whole and the specific structures that fulfill them within the message, including the message as a whole unit, providing for the message a hierarchized structure. As Jakobson’s communication or language functions are generally understood, all functions are involved in any communicative act, at least in natural language, where the factors constitute the minimal set defining the communicative situation. However, communicative acts vary in terms of the organization of these functions in relation to each other. Their organization is reflected and evidenced by the arrangement of the particular structures of messages involved in these situations. The function that underlies the structural organization of the message as a whole is termed the “dominant function”.

On the other hand, Jakobson contends that all languages share the same fundamental hierarchical build-up. Despite children being communicative in various ways from birth and even before, linguistic structures are not initially available for them. Consequently, it follows that first language acquisition must follow the grammatical build-up of language in a systematized manner: certain structures can only be formed once others have formed as prerequisites. Thus, the functional differentiation of the child’s language becomes evident through step-by-step appearance of particular structures set to fulfill these functions in specific communicative acts or communicative acts with specific dominants.

It must be remembered that Jakobson really only discusses verbal development, yet small children’s communication is functional in other various important and relevant ways. Bates and her colleagues (1979) have made significant contributions to studying them, but while their work does not contradict Jakobson’s account in its core, it is not feasible to discuss here all its interesting points.

The first function to appear in children’s early communication as distinct is phatic – aimed at creating and maintaining contact between the child and the mother – and early verbal development reflects that as well. According to Jakobson (1985: 93), next to the phatic function, early holophrases are functionally simultaneously emotive, conative, and referential, as children gradually learn to encode their attitudes (emotive function) and address caregivers (conative function) to express their needs. In the beginning of the second year of age, a distinct subclass of holophrases differentiates, used referentially to denote specific environmental occurrences (e.g., “mother”, “dog”, “ball”, “sitting on the lap”). Bates and her colleagues (1979) observe that these early holophrases are often functionally accompanied by corresponding movements and communicative gesturing.

In early syntax, functionally variant structures (as parts) are in a step-by-step manner combined with each other forming phrases as wholes, and a higher level

of grammatical complexity emerges. In the child's speech, both functional, as well as structural discernment of messages is gradually clarified. According to Jakobson (1985), the introduction of specifically metalingual speech – i.e., talk about language and meaning – is congruent with the formation of clauses, characterized by featuring an explicit grammatical subject and predicate. Earlier utterances remained highly contextualized, whereas in subject-predicate clauses, the attachment of one to another takes place within the clause itself, rendering them free and variable in relation to the situation at hand.

The formation of subject-predicate clauses enables speaking of things distant in time and space, of universes of discourse, of fictitious things, of verbal contexts, realization of the distinction between the general and the specific, as well as between words and sentences as such versus individual utterances, and much more. Subject-predicate clauses, functioning as propositions, do not necessarily relate to any particular context at all, as in equational propositions, for example. The metalingual function, whether as a component or dominant in case of specifically metalingual speech, is evident in utterances that incorporate any of these structures.

Vygotsky (1986 [1934]) distinguishes between communicative and reflexive, i.e., cognitive functions or aspects of speech. In comparison to his terminology, all of Jakobson's functions primarily serve communicative purposes, with the metalingual function specifically serving a reflexive or cognitive role, although in the cases of the referential and poetic functions, which go through fundamental transformations over the course of language acquisition, it may be debated. However, once the metalingual function is integrated within the hierarchical bundle alongside other functions, all speech, regardless of its dominant function, carries a cognitive, reflexive aspect. Consequently, formation of speech fulfilling the metalingual function is congruent with internalization of speech, as speech and thought gradually intertwine. Hence, internalization is evident in the appearance of subject-predicate clauses as thinking in "word meanings". According to Vygotsky's theory, internalization essentially constitutes as formation of symbolic thought. Jakobson's linguistic account accords with Vygotsky's psychological account at central points, with linguistic signs having the central connecting role between language and thought in the changes in meaning-making of the child at the "symbolic threshold".

The incorporation of the metalingual function into speech is intricately connected with children's adaptation to the linguistic environment (and cultural environment by way of language), having profound effects on their communication and thought. The appearance of subject-predicate clauses, in which the metalingual function is manifested, marks the true boundary zone at the "symbolic threshold". Deacon (1997), Donald (1991), as well as Bates much earlier (1979c) argue that the most compelling evidence for the emergence of symbolic thought lies in the development of the syntax as rule-based composition of signs. The critical question that remains unanswered is whether the formation of subject-predicate clauses and the ability to formulate verbal propositions repre-

sent manifestation of underlying symbolic thought or do they themselves constitute as its emergence.

The poetic function, characterized by the orientation or setting of the message towards itself, manifests in its most distinct form in (verbal) art. In *The Sound Shape of Language*, Jakobson and Waugh (1987 [1979]: 217–224) delve into “children’s verbal art”, exploring children’s play with alliteration, assonance, rhythm etc., just for its own sake – which is a very common occurrence. However, much like the metalingual function cannot be restricted to talking about language solely, the poetic function cannot be reduced to art, as it permeates all forms of speech. Similar to rhythm, the sonic contour of speech itself, alike contour in drawing or writing, holds significance as an integral part of any expression or communication of meaning.

Jakobson discusses the relationship between the metalingual and poetic functions in his brief, but very condense introduction to Ruth Weir’s *Language in the Crib* (1962), a study of a specific speech phenomenon called crib talk or crib speech. In various ways, Weir’s analysis is an application of Jakobson’s structuralist and functionalist approach. Crib speech, which will be examined in detail in the dedicated paper and introduced in the subsequent section, typically occurs among small children of about 1,5 to 3 years of age just before falling asleep. It is characterized by a distinctive, peculiar form and it happens when the child is alone in the crib, just before drifting off to sleep, as a talk by the child him or herself.

Jakobson draws a distinction between interpersonal communication, involving two individuals as the addresser and the addressee, and intrapersonal communication, i.e., communication by or with the person him or herself – terms, which are still often used nowadays in studies of self-talk. In this, he heavily relies on Vygotsky’s analyses of egocentric and inner speech, both of which are developmentally linked forms of intrapersonal speech. These concepts were specifically covered in the third paper included in this thesis (cf. Linask 2019). Throughout various papers (cf. sources at Linask 2018: 530), Jakobson emphasized the importance of intrapersonal communication for speech development. It serves both communicative and cognitive purposes, as it effects change in the communicating individual him or herself, thereby changing cognition as interpretation. In a way, Jakobson contributes to the study of egocentric and inner speech from the point of view of structuralist-functionalist linguistics – a perspective which unfortunately has been often overlooked in psychologically oriented studies of inner speech.

Crib speech is intriguing because, due to its audible nature, it serves as an observable form of intrapersonal speech before it becomes internalized within the child. In crib speech, various linguistic structures are in the process of their formation, and it is part of the process during which language is being integrated within the child’s thought process. Unlike egocentric speech, studied by Vygotsky (1986 [1934]), which is common among slightly older children, crib speech is not used for problem solving, but for fun (cf. detailed analysis in Linask 2023). As noted by Jakobson and Weir, two-year-old Anthony, whose

speech Weir studies, employs crib speech for language practice. The overall construction of crib speech is set upon the hierarchical organization of speech itself, rather than communicating something (referentially, or in the phatic, emotive or conative functions) to another person. Consequently, although small children of this age lack the linguistic means to talk about language, Jakobson suggests that crib speech is predominantly metalingual. He also proposes that the metalingual and poetic functions are not yet differentiated in crib speech, contributing to its distinct poetic form. The analyses provided in the last paper of this thesis bring clarity to this issue.

In addition to providing a conceptual overview of Jakobson's theory for history of semiotics, the paper serves multiple purposes for this thesis as a whole. It helps to understand structural and functional foundations of the child's early language use, along with the developmental steps leading to language acquisition, thereby giving the child access to her or his culture. Equally important, the paper presents a conceptually accessible linguistic counterpart to Vygotsky's account of cultural development of the child. For both of these authors, the unit of analyses is the sign, which has its central task and role of connecting both the communicative and cognitive aspects, as well as external and internal aspects of meaning-making, bridging linguistics and psychology by way of semiotics. Furthermore, Jakobson's theoretical account lays the groundwork for conceptualizing self-talk in small children in terms of general theory of communication, as well as semiotics, which is presented in the final paper of this thesis and summarized in the subsequent chapter.

Autocommunication in crib speech and private speech²²

The fifth article, which in some ways stands as the central piece in this thesis, presents a closer investigation of the speech phenomenon known as crib speech. Unlike preceding articles, this study is not purely conceptual, although it is an application of previously established conceptions and frameworks, and it repositions the study of autocommunication conceptually, among its other tasks. It does not serve as a history of semiotics, which is partly the task of previous papers. Rather, it is an analysis of a specific speech phenomenon that occurs in young children, and previously introduced frameworks are used to provide explanations for the conditions of its occurrence and appearance. The investigations into Vygotsky's and Jakobson's theories, as well as Uexküll's and Muchow's studies, although the latter is not explicitly mentioned, serve as prerequisites for this concluding paper. These approaches are synthesized and integrated within Juri Lotman's concept of autocommunication, which is adopted and developed to provide a comprehensive account of crib speech, bringing the thesis together as a whole.

It is one of fundamental tenets of semiotics to hold that all phenomena of mind, whether external or internal, are communicative, and thereby semiotic in nature²³. Autocommunication is communication, in which the addresser and the addressee of a communicative message are the same – it is communication with oneself. As all communication also relates back to the subject or person who communicates, it is often held in semiotics that all communication has an auto-communicative aspect.

Although the concept is best known after Juri Lotman's (e.g., 1990) work in cultural semiotics, the idea can be traced back to Jakobson's concept of "intrapersonal communication", and further down the road to Charles Peirce's idea that thinking in general is carried on in the form of internal dialogue (cf. Linask 2023: 68). In certain instances, autocommunicative aspects of communication become distinctly relevant for the interpreting subject. In the ontogeny of human meaning-making, these aspects are differentiated from communication with another person as distinct forms set for specifically autocommunicative purposes. Both Lotman and Jakobson refer back to Lev Vygotsky's work on private and inner speech as the clearest case of where distinct characteristics of such kind of communication can be best recognized (cf. Linask 2018; Linask 2023). Although the idea originates in Vygotsky's psychology and Jakobson's language-centred theory of communication, and it has mostly found use as "cultural autocommunication", this thesis argues that the concept of autocommunication can be productively taken back to study the processes of mind within the ontogeny of the child, particularly the changes that take place in the

²² Published as: Linask, Lauri 2023. Autocommunication in crib speech and private speech. *Semiotica*, 250, 67–90.

²³ E.g., cf. Deacon 1997: 70 on Peirce in this matter.

interactions between speech and thinking, deemed as “intrapersonal”, “egocentric” or “private”, and “inner”.

The close connection between Lotman and Vygotsky in their approach to autocommunication and memory has been extensively discussed by Andrews (2012; 2015). However, Andrews argues that Lotman’s concept of autocommunication is not based on Vygotsky’s notions of egocentric and inner speech, while this dissertation (cf. Linask 2023) suggests that Lotman’s concept is a complementary elaboration of Vygotsky’s idea. True, as a synthesis of several approaches, Lotman conceptualizes autocommunication on a more general level of communication theory, rather than within the framework of child’s semiotic development, while taking the concept to its own productive alleys. Comparing Vygotsky’s and Lotman’s approaches, Andrews (2012; 2015) acknowledges the importance autocommunication on both individual and collective levels, thus bridging Vygotsky’s and Lotman’s approaches within cognitive science.

From the point of view of this thesis, Andrews’s work with colleagues (Skotko *et al.* 2005) is also noteworthy for its contemporary application of Jakobson’s speech functions in analysing the loss of language in the case of a patient named H. M. In that, interrelations of speech and thinking as per Vygotsky are already assumed.

Lotman distinguishes two types of autocommunication: the mnemonic type of using signs to remind oneself of something; and the type in which a communicating subject actively communicates with oneself, in other words, interprets oneself, e.g., one’s own speech or one’s own thinking – which he calls the “I-I” type (Lotman 1990: 22). Specifically, the “I-I” type is relevant to cases of personal diaries, internal monologues and other kinds of self-talk. Both the mnemonic type and the “I-I” type can be distinguished from communication with another person, and both can be distinguished from each other by certain characteristic features. These features can be difficult to interpret or decipher by another person for whom they are not addressed, however, autocommunicative messages are structured in specifically recognizable ways, thus providing cues for their study.

The paper presented in this thesis combines Lotman’s theories of autocommunication from *Universe of the Mind: A Semiotic Theory of Culture* (1990), and his model of communication from *Culture and Explosion* (2009), to outline the nature of structures characteristic to autocommunication, relate them functionally to Jakobson’s communication model, and explain the purposes that such a paradoxical appearing type of communication might have. Introducing the “I-I” type concept of autocommunication, Lotman takes a step further from Jakobson’s more one-dimensional model of the “addresser-addressee” relationship, as it takes the addressee to be an interpreter to have an active part in the process of communication.

Once outlining this far more dynamic version of the communication model, compared to Jakobson’s earlier structuralist-functionalist model, this paper applies it to the study of young children’s self-talk in the example of what is called crib speech. In the thesis, it is shown how the interpreting mind uses

specifically autocommunicative structures of messages to change the communicating subject itself, i.e., the interpreter's state of mind, in relation to the situation at hand, either as to the message or what it is set to convey, or both. In the paper, these processes are analysed both on the level of microgenesis, as well as on the level of ontogeny. If the message is not set up and communicated to bring about change in an "other", it is set up and communicated to bring change within one's self. The article takes Lotman's model and adapts it to analyse crib speech as a particular case of autocommunicative speech to systematically describe its form, its structural features, its functions within communicative action, as well as within the ontogeny of speech and thinking, and consequently provide an overall explanation of its nature.

Crib speech occurs among about 1.5 to 3-year-old children as pre-sleep monologue or soliloquy, distinctly when the child feels that she or he is alone. Only some children engage in it, although children's self-talk is not uncommon in general. Crib speech has a characteristic, peculiar form for which it has been distinguished as a speech genre²⁴. The thesis argues that in regard of the development of human meaning-making, various important aspects are observable in crib speech, which remain indistinguishable in interpersonal communication, or hidden once inner monologues become silent during the child's semiotic development. Among many others, as crib speech is truly a rich phenomenon for semiotic study, these aspects include and concern the acquisition and development of speech, the interrelations of speech and thinking, the child's construction of, as well as interactions and experience with him or herself, the child's creative construction of her or his surrounding world and him or herself within it, verbal, or more broadly, symbolic play as meaning-making, and the general problem of the threshold of symbolic thought in the ontogeny of the child.

The first to study crib speech was Ruth Weir, who observed her son Anthony when he was two to two-and-a-half years old. To provide an idea of what it looks like, here there is an excerpt from Weir's (1962: 126) observations:

Excerpt 1. *Step on the blanket – Where is Anthony's blanket – Where is Anthony's blanket (falsetto) – Where's hiding (falsetto) – Books – Down – Down – Have the books today – I take the white blanket off – On the blanket – Under the blanket – Sleep go – What a blue blanket – What the take the blanket...*

²⁴ Crib speech typically occurs among small children who are accustomed to sleeping alone, but most children around the world are not. It is worth noting that in general, children often engage in self-talk. It is quite plausible that when small children of this age engage in verbal play, it may sound a little akin to what has been described as characteristic of crib speech, albeit perhaps topically less restricted to happenings around sleep time. Distinguishing crib speech as a speech genre may involve a degree of reification, as Weinstein and Baldwin (cf. 2024) describe among other "speech genres". It would be worthwhile to carefully observe other instances of small children's self-talk, as more could be learned from it regarding cognitive and reflexive aspects of speech within interactions between language and thought.

Since Weir's pioneering work, there have been subsequent studies, although the number of children whose crib talk has been observed remains regrettably small (cf. overview in Linask 2023: 69). However, due to the challenges in observation, comprehension, and understanding the reasons for its unusual appearance, interpretation of crib speech has remained largely open up to the present day. Consequently, there is a wide variety of interpretations, ranging from linguistically and psychologically oriented perspectives to studies on cognitive narratives, the development of the child's self, dialogical and Bakhtinian studies, and psychoanalytic interpretations, among others (cf. Nelson, ed. 2006 [1989]; Linask 2023). This paper proposes its own analysis from the perspectives of semiotics and communication theory based on Juri Lotman's concept of autocommunication, while also integrating several other approaches, particularly those of Vygotsky (1986 [1934]), Jakobson (1971 [1962]), Weir (1962), and Nelson (2006 [1989]; 2015), to explain why crib speech exhibits such extraordinary structure.

To explain the nature of crib speech, the paper compares crib speech structurally and functionally with what is known as private speech (or "egocentric speech", as Vygotsky termed it following Piaget). Oddly, although both Jakobson and Weir briefly mention Vygotsky's work in relation to crib speech's connection with "egocentric" and "inner" speech, Vygotsky's theories really have not been used in the study of crib speech to date, a gap that this thesis also seeks to address. In the paper, Vygotsky's theories of signs and symbolic activity, and acquisition and formation of sign use in small children, as well as the theory of internalization of social speech within thinking of the child is used to explain the relationships between these "speech genres" and changes in children's thinking. Crib speech is analyzed in the context of ontogeny of symbol use.

Crib speech and private speech share several significant commonalities, but also some notable differences. Both characteristically present as the child's vocalized self-talk, although they occur at different ages (private speech is typically observed at 3 to 7 year-olds, with its distinctive features developing at later stages). Crib speech exclusively occurs when the child feels as if alone, while private speech often occurs in the presence of others. They also share similarities in their form (cf. Linask 2023: 77): both appear as condensed, abbreviated, and elliptical, with a tendency towards predicativity. However, private speech is less about attention to sound and meaning, and expression and content, of speech activity as such, which has been analyzed in this thesis as distinctive to crib speech. Furthermore, both types of speech are free, at least in principle, although often not in practice, from *hic et nunc* of the setting in which they are uttered. Future studies should explore whether crib speech and private speech are genetically homologous or analogous phenomena.

The most distinctive aspect of crib speech is its play-like, somewhat poetic form. Episodes of crib speech consist of strings of words and fragmentary, open-ended phrases that are repeated and modified with variation. Episodes are structured on both expression and content levels. While Weir (1962) focuses on describing sound play, rhythm, rhyme, alliteration, phrase symmetry, among

other characteristics, Nelson (2006 [1989], 2015) emphasizes narrative structures representing the child's daily experiences. Moreover, crib speech sessions typically revolve around a central unifying theme. The article demonstrates how all these structural features taken together give crib speech episodes as wholes an integral, hierarchized, "text"-like organization, in the sense of how Lotman uses the term (e.g., Lotman et al. 2013 [1973]: 58–59). Lotman's concepts of "text" and his analyses of "play" and "art" as modelling systems (Lotman 2011 [1967]) are employed to structurally describe and explain crib speech's creative nature and the means by which children use crib speech to generate meaning. Analyzing children's certain communicative activities as playful, creative phenomena, even of textual nature, may well prove beneficial for understanding other phenomena also that have been restricted more narrowly as linguistic or psychological, rather than as secondary modelling systems. Already Johan Huizinga, in his *Homo Ludens* (1949 [1938]), famously recognized the cultural significance and value inherent in symbolic play activity as such, in its own right, irrespective of any other psychological function it might serve.

While characteristic features of private speech have been found to be most evident during problem solving, crib speech is most distinct as play with language and meaning. As crib speech is not used for communicating something to another person, its referential function is rendered as secondary even in case declarative clauses are involved; instead, the metalingual and poetic functions prevail. Jakobson's analyses of the structural contrast between the metalingual and poetic functions is applied to structural analyses of crib speech. The thesis shows how "poetic" devices and informational redundancies are used in crib speech for bringing the locus of speech activity upon speech itself.

As various linguistic structures are in the process of formation during crib speech age-period, and as crib speech is about play with language, crib speech often strikes as if language practice. Indeed, the practice of formulating and modifying subject-predicate clauses is common during crib speech episodes. Crib speech is one of the earliest observable linguistic expressions of symbolic thought liberated from its immediate context. Although it is often topically tied to the surroundings of the crib, it is not always tied to the spatial and temporal setting of the utterance as a linguistic structure. Moreover, it is set on speech activity as such, free and variable within its experiential context. Finally, in subject-predicate clauses, one is tied to the other, forming a conceptual whole by relating individual ideas together, rather than situated in the child's sensorimotor activity within the surrounding environment. All of this emphasizes crib speech's significance as source of evidence for the study of the threshold of emergence of symbolic thought.

Meryl Sole (2014) has studied 9 children's (18 to 36 months) solitary pre-sleep singing and spontaneous musical vocalizations more broadly. Regretfully, her study is not included in this work in the discussion of crib speech. At first, pre-sleep singing among the two-year-olds might seem to be a phenomenon different from crib speech as in the case of songs the children already appear to have the "text" available beforehand, instead of creatively producing one on

their own. However, Sole observes children engaging in various kinds of free-flowing vocalizations, re-working already learned songs (altering songs in terms of form and repetition) and fully improvising, which all qualify for playful speech and text generation, which was the focal interest of the essay included in this thesis.

Moreover, Sole's study adds an important layer of meaning to the narrowly linguistic one, which certainly should not be ignored in a semiotic study, which aspires to embrace all aspects of the study of meaning-making – in this case, that of human voice, sound, and melody. The central thesis for the paper at hand has been that in autocommunication, vocalization itself as a modality (the message, messaging as such and/or the code) is meaningful, rather than any referential message that it might carry. Children's musicality broadly (conveying both self-expression and art) and the sound of human voice more narrowly, are most certainly relevant to this discussion (cf. preceding discussion of Jakobson's "poetic function"). It appears that children often seek to explore various musical qualities of words and sounds, and sometimes the tune is more important than words. Confirming literature on general pre-sleep vocalizations, toddlers observed in Sole's study were singing to reflect, experiment, learn, express emotion, self-soothe and make sense of their recent experiences (Sole 2014: i). In the light of Sole's research, analysis provided in this thesis has been somewhat restrictive.

However, the descriptions that Sole gives are very much in line with the ones given in the essay included in this thesis: often singing and talking takes place intermittently, one going over to another in a fluid manner. Based on Sole's (e.g., 2014: 97) analysis, it is quite possible that for children, there is no principled difference as to whether they do singing or talking, although there is some preference in terms of the specific child, of course (cf. 2014: 165). Her thesis is also valuable in that it clearly spells out that crib speech is self-soothing, an aspect neglected in other studies. Sole's more descriptive findings overall do not contradict analyses put forth here and they may be kept in mind when reading the work²⁵.

²⁵ It is the view of the author of this thesis that taken broadly, autocommunication is not at all restricted to verbal communication already in early childhood. While not using the term itself, Rodriguez and Moreno-Llanos (2023) have recently reviewed the relevant literature and conducted a semiotically informed case study with a child from 8 to 17 months of age, suggesting that already at a very early age, self-directed and "private" ostensive gesturing (i.e., holding an object up for oneself), pointing, and symbolic gesturing (i.e. bringing one's own attention to different aspects and sides of the object) for the purpose of self-regulation takes place with the help of external objects or instruments. While their study does not trace the effect of social interaction upon the development of self-regulation, it appears that when coordinating means and ends, objects and gestures can be made use of for one's own purposes from an early age for reaching a goal that the child him or herself has set up. While the study suggests the importance of the material context of object use in the pragmatics of the development of self-regulation, Rodriguez and Moreno-Llanos do not study the relationship between coordinated movement (or "early gestures", as they call it) and (self-directed) speech. While this relationship is a fundamental problem as to the interrelations of thought

Often, crib speech is not only abstract monologue, but enactment of daily social interactions (as in *Excerpt 1*), appearing as imaginary conversations between the parent and the child, or between toys. It is important to recognize that in these dialogues, the child's subjective position as to the topical interactive situation is playfully renegotiated, as well as the child's grammatical focalization in relation to the narration. Crib speech should be further investigated in relation to the narrative –, and more broadly, the semiotic construction of the dialogical self.

The “dialogical self” is a concept that describes the mind's disposition of imagining internal dialogues involving participants in different positions. The dialogical self theory (DST), which has been prominent in cultural psychology since Hubert Hermans (e.g., 2001; 2018) work starting in the 1990s, proposes that the self, as a society of mind, includes a multiplicity of interacting self-positions. Both semiotics and DST have sought to surpass the external-internal divide (clearly evident also in this dissertation; also cf. Wertsch and Tulviste [2005] on Vygotsky; and Cole [1996: 129] on cultural psychology, regarding this issue) and hold that phenomena of mind, external or internal, are communicative. Lotman's concept of autocommunication, the phenomenon of crib speech, and DST should be brought together, because it seems that “I-I” type autocommunication and the idea of secondary modelling systems present as valuable models for explaining the functioning of dialogical processes within an individual person's mind. So far, crib speech has not caught the attention of DST. Crib speech often appears as imaginary conversations in which the child takes both roles of the participants, with turn taking between different conversational voices. This suggests that crib speech provides as a forum of interaction at which the child's self is formed and enacted, while providing observable evidence for the nature of self and for the dialogical self theory. The study of dialogical self, not restricted by the boundary of the human head, and studied as a textual phenomenon within which the discourse guides communicative interaction and the subjective positioning in relation to the discourse, might prove beneficial to understanding the psychological self.

Moreover, it is not only the dialogues that are (re-)enacted in these talks. Katherine Nelson has analysed crib speech of two-year-old Emily in terms of narratives in which Emily organizes her experience of everyday events. As the paper presented in this dissertation shows, at the level of the narrative, the overall textual organization of a crib speech episode is most clearly apparent. Nelson (2006 [1989]) is arguing that as a practice in narrative form, Emily is constructing for herself a coherent, comprehensible, understandable world, in which she is taking her place in everyday activities. At the level of the narrative,

and language, from the point of view of the progressive development of these interrelations, it seems reasonable to suggest (as do Rodriguez and Moreno-Llanos, 2023, who do not dwell on the issue) that already in early use, speech and gestures functionally form “a multimodal unit” (McNeill 2000: 9), which should be taken as a whole, in regards of speech development.

the autocommunicative organization of the child's world is no longer limited to the content in the service of expression of the linguistic form, but also of the form expressed in the service of organising content. Consequently, narrative structures are expressed in self-talk of the child, moreover, as means of providing for human-specific spatiotemporal organization of *umwelt* – as for a creative construction of a universe of meaning, the *semiosphere*, on the level of a person's mind.

In conclusion, the dissertation shows that the extraordinary structures characteristic to crib speech, which have been difficult to explain since the beginning of their observation in the 1960s up to date, as hierarchically delineated in this paper in relation to the formation of symbol use in the small child, as well as in relation to the formation of linguistic structures during language acquisition, can be explained by crib speech's autocommunicative nature both in form and function. It is the vocalized, performative linguistic expression as such, which the speech activity provides, proving it valuable for the somnolent child. As an externalized representation, its structural build-up dynamically changes the child's position as to the child's discourse, as well as the discursive formation of the child's understanding of the world. Its poetic, playful character serves for bringing language and meaning in the creative awareness of the child, as well as for the construction of the child's universe of meaning.

CONCLUSIONS

Over the course of its history, developmental psychology has made use of a variety of theories of signs, adapting them to its own needs. Concepts of signs have contributed to modelling and conceptualizing the dynamic processes that take place over the course of early childhood, when the child's psyche undergoes rapid growth, change, and transformation in interaction with its physical, physiological, sociocultural, and psychological environment. Theories of signs have been instrumental in explaining the (re-)organisation, as well as emergent complexity of the child's mind as a cohesive functioning entity. The strength of concepts of signs lies in the emphasis on the active, creative nature of the inquisitive mind, as it develops while making sense of the world. However, these inherently semiotic theories and concepts have often been employed spontaneously due to sheer necessity, or adopted without sufficient reflection on their nature and origins. At times, they are only adopted in fragments from larger systems of thought, or synthesized uncritically as to their philosophical and semiotic foundations.

A more comprehensive, cohesive, and systematic theory and study of signs that encompasses all varieties and potential levels of meaning-making, while conceptualized specifically with a focus on ontogeny – including the transitional and transformational changes in human-specific meaning-making – could contribute clarity to psychological studies of meaning-making in child development. After all, the child's relationship and interaction with the environment, as well as with him or herself, is inherently meaningful.

Moreover, human-specific meaning-making is not an isolated phenomenon, but rather takes place as situated within sociocultural environments and contexts. Children adopt and form signs and sign use as cognitive structures in order to engage within textual and interpretative communities. Within these communities, culture is collectively formed and developed. The study of concepts of signs and culturally shared meaning-making enables conceptualization of the mind as a social phenomenon, as well as an understanding of culturally inherited means of meaning-making.

Conversely, in contemporary theories of culture and texts, it is often taken as almost self-evident that cultural, discursive, and textual phenomena are inherently meaningful. Yet, it is frequently overlooked that these phenomena are not only expressions, but also extensions and embodiments of human psychological functioning, which itself is a dynamic phenomenon. Cultural meaning-making is an interpretative process that involves active, contributory, and creative engagement, as well as the performative participation, of competent and skilful members within cultural communities. Cultures provide for their individual members – who are psychologically dynamic and complex participants – psychological means, or signs, for physical, physiological, social and psychological functioning. A closer, more careful and considerate observation and examination will show that cultures, as well as its constitutive parts such as

texts and languages (codes), are intricately built and structured to accommodate psychological functioning. Therefore, meaning-making cannot be reduced merely to discourses and texts; it must also involve individual engagement of minds. In this regard, cultural meaning-making can always be traced back to nature. Vygotsky (1994 [1929]: 59) adds that culture creates nothing new, it just modifies nature to suit its goals.

Therefore, developmentally transposed theories of signs, with a focus upon the ontogeny of human-specific meaning-making, carefully considerate of ontogeny of meaning-making in other species, will help in uncovering and explaining the origins of cultural meaning-making in individual members of cultural communities. The study of the ontogeny of signs, particularly the semiotic development of the human child, is also likely to be the key to understanding the evolutionary origins of human-specific meaning-making, including the birth of culture as both its process and product.

The five papers presented in this dissertation each represent and embody a developmental approach to meaning-making in children. Bringing together meaning-making by way of signs as understood in these interrelated approaches in biology, psychology, linguistics, culture, and semiotics, this dissertation hopes to contribute to conceptualizing semiotic understanding of signs in terms of ontogeny and child development, as well as to the study of how children make meaning in their surrounding worlds, how meaning-making changes over time, and how children themselves change in the process as a result.

This thesis relates theories of signs and meaning-making with approaches to child development, proposing an account of the semiotic development of the child. It posits that young children's meaning-making within the world is constituted by signs, while changes in meaning-making can be described by studying changes in signs, which take place in the course of child development. It further explains changes in children's meaning-making within the surrounding cultural environment during early child development and argues that symbols integrate the cultural and the individual levels of human behaviour functionally.

Human specific symbolic behaviour is formed when speech, or verbal communication, and other psychological functions are progressively interwoven, leading to reorganization of thinking as a consequence. The dissertation provides an account of how young children form and use signs within the changing interrelations of speech and thinking, and a complementary account of the functional differentiation of the child's speech, corresponding to the formation of linguistic structures during language acquisition.

Originally a means of communication with other people, speech evolves into a means of cognition and reflection. The thesis describes distinct forms of speech, which emerge as a consequence, serving specifically cognitive, reflective purposes. Integration of speech and thinking is observable in these specific forms of autocommunicative speech, namely, egocentric speech, or private speech, inner speech, and crib speech. This dissertation provides an explanation of the structures and functions of specific genres of children's self-talk, con-

ceptualized as autocommunication, within the framework of theory of communication. It gives a description and an analysis of the nature of crib speech, including its structure and roles both in terms of the sign processes within which it arises, as well as in terms of ontogeny of interrelations of thinking and speech. The structure and functions of crib speech, and consequently its peculiar appearance, can be explained by the stage of development of language acquisition and thinking at the second-year-of-age, and by its autocommunicative nature.

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SUMMARY IN ESTONIAN

Autokommunikatsioon lapse semiootilises arengus

Kõige avaramas mõttes uurib käesolev väitekiri laste tähendusloomet ja selles aset leidvaid muutusi laste arengukaares, mis viivad järk-järgult selleni, et lapsed saavad osalisteks end ümbritsevas kultuuriliselt tähenduslikus keskkonnas. Kultuuri määratletakse sageli inimestele iseloomuliku ja ainuomase tähendusliku nähtusena. Inimeste jaoks on kultuur ning kultuuriliselt pärandatud ja päritud tähendusloome-vahendid ellujäämise seisukohast vältimatud ja neid kantakse psühholoogiliselt endaga ühes ka siis kui oma kultuuriruumi piirest välja poole juhtutakse.

End ümbritseva kultuuri ja kultuuriruumi mõistmine ei ole inimestele aga sünnipäraselt kaasa antud, vaid ajas muutlik, tekkides ja kujunedes kultuurilise õppimise käigus sotsiaalses suhtluses teiste inimestega. Samuti ei sünni kultuuri ja kultuurilise keskkonna mõistmine ühekorruga ja äkitselt, vaid toimub järk-järgult, mitmete arenguliste sammude kaudu, milles laps erinevad ümbritseva kultuurilise keskkonna mõistmise ja tähendustamise viisid omandab ja kasutusele võtab. Nende viiside näideteks võib paljude teiste seast välja tuua mõistete moodustamise, keele omandamise ja narratiivse mõtlemise kujunemise. Kõiki selliseid näiteid iseloomustab see, et nendes leidub kultuuriliselt ja sotsiaalselt jagatud osa ning õppimise ja omandamise käigus saavad need nähtused selle kultuuri näo, milles nad parasjagu ilmuvad.

Lapse tähenduslik suhe ümbritseva maailmaga teiseneb sedavõrd, kui võrd temas leiavad aset füüsilised, füsioloogilised, psühholoogilised ja kultuurilised muutused. Nii nagu lapsele avaneb kultuuriliselt tähenduslik maailm, muutub ja teiseneb ka laps ise, sealhulgas tema arusaam ja ettekujutus iseendast ja oma enese mõtlemisest. Dialoog ja kommunikatsioon ümbritseva maailmaga on seepärast ka dialoog ja kommunikatsioon iseendaga ehk autokommunikatsioon.

Semiootikas käsitletakse tähenduslikkust märgilisena. Ehkki kultuurist leiab kõiki tähendustamise viise ja seepärast kõiki märgitüüpe, on enamik semiootikuid ühtemeelt, et kultuurilisele tähendusloomele on eripärased arbitraarsed ja konventsionaalsed sümbolmärgid; nende seas on eriline roll keelemärkidel. Enamik semiootikuid peab ka puht-mõistelist mõtlemist eripäraselt sümboliliseks nähtuseks, ehkki see võib lisaks sümbolitele kätkeada ka teisi märgitüüpe.

Sümbolilise mõtlemise kujunemist ja sümbolite kasutuselevõttu arengus on olnud läbi aegade keeruline selgitada ja see on teineteisega sidunud lähenemisi õige erinevate teaduste seast, nagu filosoofia, keeleteadus, antropoloogia, arengu- ja kultuuripsühholoogia, neuroteadus ja semiootika. Inimestele ainuomased ümbritseva maailma tähendustamise viisid on tihedasti seotud kultuuri ja looduse põimumise probleemiga inimestes endis, kus sümboliline tähendusloome välja kujuneb. Sealjuures on tähendus ühtaegu väline, ühiskondlik nähtus, mis on kultuuriliselt ühine ja jagatud, teisalt aga sisemise mõistmise ja tõlgendamise tulemus. Et kultuurinähtused on iseloomulikult tähenduslikud ja märgilised, puudutab sümbolilise mõtlemise kujunemise probleem seepärast

humanitaar- ja kultuuriteaduste aluseid. Teisalt on laste psühholoogilise arengu seisukohast vajalik mõtestada kultuur.

Seetõttu, et märgid vahendavad inimestevahelist suhtlust, ning et neis on kätketud inimeste tähenduslik maailm, ühendab huvi märkide vastu semiootikat ja arengupsühholoogiat. Läbi aegade on arengupsühholoogias erinevaid märgikäsitlusi kasutatud, et kirjeldada muutusi ümbritseva maailma tähendustamise viisides, mis lapse arengu käigus aset leiavad. Samas on arengupsühholoogias levinud märgikäsitlused sageli mõnevõrra juhuslikku laadi või ei osata märgata nende käsitlustega seotud filosoofilisi ja semiootilisi nüansse. Teisalt aga ei tunne semiootika, mis uurib tähendus- või märgiloomet kõikides selle esinemisviisides, sugugi hästi seda, kuidas lapsed ümbritsevat maailma tähendustavad ning kultuuriliselt tähendustama õpivad. Seda lünka püüab käesolev töö täita.

Käesolevast väitekirjast leiab kokku viis artiklit, mis käsitlevad väikeste laste tähendusloome arengut erinevatest, ent metodoloogiliselt ja ajalooliselt vähemalt mõnevõrra seotud vaatenurkadest. Esimesed neli on pigem teoreetilist laadi ja nendes käsitletakse ja arendatakse märkide ja tähendusloome problemaatikat laste semiootilise arengu kontekstis. Viies kujutab endast nende teooriate rakendust, et selgitada ühte eripärast autokommunikatiivse kõne vormi, hällikõnet, mida esineb väikeste laste seas justnimelt sel ajal kui sümboliline märgiloomet oma kuju saab.

Esimene artikkel käesolevas töös, mille pealkiri kõlab eesti keeles – „Rakendades Jakob von Uexkülli omaailma-mõistet inimese kogemusele ja arengule“ (Linask; Magnus, Kull 2017), käsitleb tähendusloomet kui elusloodusele iseloomulikkust nähtust bioloogi ja biosemiootika eelkäija Jakob von Uexkülli töödes, sidudes märgikäsitluses semiootika ja bioloogia. Samal ajal aga küsib artikkel, kas Uexkülli väljapakutud „omailma“ mõiste kasutuselevõtuga ja sellega seotud „funktsioonitsükli“ käsitlusel on midagi ka lisada sellele, kuidas uurida ja mõista spetsiifiliselt inimestele iseloomulikkust tähendusloomet. Artikkel väidab, et sellise rakenduse leiab ökoloogilise psühholoogia eelkäija Martha Muchow 1930ndate aastate tööd, milles Uexküllile toetudes uuritakse analoogiliselt Hamburgi linnalaste eluilmast ja tähenduslikku toimimist ümbritsevas linnaruumis.

Teine ja kolmas artikkel uurivad märkide rolli laste arengus, korrastades selleks tervikuks arengupsühholoog Lev Vögotski mitmetes kirjutistes leiduva märgitemaatika. Artiklid rõhutavad märgiteooria ja märgi mõiste tähtsust lapse kultuurilise arengu käsitluses, mille Vögotski oma kultuuriajaloolise lähenemise raames välja pakkus. Arengupsühholoogid on märkide osa Vögotski teoorias ajalooliselt pigem alaväärtustanud, ehkki Vögotski enda jaoks oli märk (ja kitsamalt keelemärk) psühholoogilise analüüsi ühik. Teisalt asub Vögotski märgiteooria erinevates tekstides laiali, mõjudes niiviisi kriitikuile sageli fragmentaarselt, sealjuures on tekstid ise autori varase surma tõttu lõpetamata ja mitmel juhul visandlikud. Muuhulgas on artiklite panuseks Vögotski märgikäsitluse terviklik rekonstrueerimine.

Esimene neist kahest artiklist küsib, „Kas Vögotski vaatenurk on märkide arengu kirjeldamiseks sobilik?“ (Linask 2012) ja visandab märkide osa eri-

nevate protsesside siduja ning ühendajana, nii nagu see Vögotski arengukäsitluses on kirjeldatud. Märgid toimivad ühtaegu nii kultuuritasandil kui individuaalse inimese mõtlemises (mida ei tohiks Vögotski teoorias kuidagi sulgeda inimese pähe või naha piiridesse), sidudes kaks tasandit teineteisega. Teisalt eristab sümboliline tegevus, sealhulgas mõtlemine, ning sümbolmärkide kasutamine inimest kui liiki käitumiselt teistest liikidest, pakkudes selgituse inimeste üsna radikaalselt erinevatele keskkonnasuhetele, võrreldes teiste liikidega. Sümbolilise mõtlemise kujunemine eristab imikuea varasest lapseast, sealjuures tähistab see oluliste kvalitatiivsete muutuste aset leidmist lapse käitumises ning kultuuriliselt tähendusliku käitumise ja mõtlemise algust. Viimaks, märkid on loomult protsessuaalsed ning märgimudel võimaldab käsitleda tähendust-loovat või -andvat akti ennast – seda, kuidas millestki saab mõtlema ja tunnetava lapse jaoks märk, näiteks keelemärk. Vögotski uuris sedaviisi tervet hulka kultuurilisi ehk sümbolmärgilisi nähtuseid – joonistamist, diagramme, laste mängu ja mänguasju, žeste ja liigutusi ning paljut muud. Vögotski käsitlus on selgesti semiootiline, kätkehes endas nii märgiteooriat kui laste (kultuurilise) arengu teooriat.

Teine Vögotskile pühendatud artikkel, „Lev Vögotski ja märkide looduslugu“ (Linask 2019), süveneb põhjalikumalt märkide loomusesse Vögotski märgikäsitluses ja uurib, kuidas sümboliline käitumine tekib ja kujuneb. Inimeste spetsiifilise käitumise aluseks on keelelise suhtlemise ja teiste psühholoogiliste funktsioonide põimumine. Keelemärk on selline psühholoogiline struktuur, milles erinevate psühholoogiliste funktsioonide toimimine kultuuriliselt ümber organiseeritakse. Töös kirjeldatakse põhijooned, kuidas sümbolid laste käitumisse seotakse, ning käsitletakse sellega kaasnevate psühholoogiliste funktsioonide ja nende vaheliste suhete muutusi. Kultuurilise arengu käigus moodustuvad inimestele iseloomulikud käitumiste vormid, mis läbi laste suhe nende sotsiaalsesse ja materiaalsesse keskkonda teiseneb. Vögotski kirjeldab märgikasutuse kujunemist ja analüüsib selle arenguastmeid. Vögotski lähene mine selgitab, kuidas erinevate märgisüsteemide kasutamine muudab tunnetusprotsesse lapse arengus. Eraldi on tähelepanu pööratud sellele, et märkide sise mine struktuur selle arengu käigus samuti muutub. Lapse keelemärgiline kõne ei ole nende muutuste tulemusel enam pelgalt kommunikatsioonivahend, vaid ümbritseva maailma ja enese tunnetamise vahend. Sealjuures eristuvad lapse kõne ja mõtlemise suhete arengus sisemised protsessid järk-järgult välistest. Vögotski märgiteooria kirjeldab ja selgitab kultuurilise tähendusloome tunnetuslikke aluseid.

Neljas artikkel käesolevas doktoritöös, „Keelefunktsioonide eristumine laste keeleomandamise käigus Roman Jakobsoni kommunikatsioonimudeli põhjal“ (Linask 2018) kujutab endast Roman Jakobsoni kuulsat kommunikatsioonimudeli funktsioonide arengusemiootilist käsitlust. Töö selgitab, kuidas laste keeleomandamise käigus verbaalsete teadete funktsioonide tüübid eristuvad. Keelefunktsioonid – referentsiaalne, emotiivne, konatiivne, faatiline, metakeeleline ja poeetiline – mida mõistetakse Jakobsoni kommunikatsioonimudeli raamistikus, eristuvad progresseeruvalt vastavalt erinevate keele struktuuride moodustumis-

sele ja nende kasutamise järk-järgulisele omandamisele kõne arengu käigus. Grammatilise subjekti ja objekti eristumine lausete moodustamisel vastab laste keeleomandamise käigus metakeeleliste teadete moodustamise ilmumisele ning on seotud laste kohandumisega keelekeskkonnaga. Metakeelelise ja poeetilise funktsiooni eristumine on laste keele ja mõtlemise suhete arengus vaadeldav hällikõnes. Kommunikatsiooniteoreetiline raamistik võimaldab laste suhtlemise arengulist uurimist ja täiendab Vögotski lähenemist keele omandamise ja kõnestruktuuride kujunemise seisukohast. Vögotski käsitlus võimaldab näidata, kuidas märgikasutamise käigus muutub lapse suhe ümbritsevasse keskkonda ja ühes sellega teiseneb lapse enese mõtlemine. Jakobsoni kommunikatsioonimudel ja selle raames käsitletud keelefunktsioonid võimaldavad näidata, kuidas moodustuvad keelestruktuurid lapse mõtlemises toimuvaid muutusi kannavad ja toetavad.

Viimane, viies töö käesolevas doktoritöös, pealkirjaga „Autokommunikatsioon hällikõnes ja privaatkõnes“ (Linask 2023) tutvustab Lotmani autokommunikatsioonikäsitlust kommunikatsiooniteooria edasiarendusena, sidudes selle Jakobsoni ja Vögotski raamistikega. Uurimise peamine eesmärk on aga selgitada ühe erilise kõnevormi, hällikõne kuju, ehitust ja rolle lapse semiootilises arengus.

Hällikõne tuleb ette umbkaudu 1,5 kuni 2 aastaste laste seas, parasjagu enne seda, kui laps unne suikub, siis kui arvab, et on omaette. See on väga iseäralike tunnustega vokaliseeritud kõne, mis pole mõeldud kellelegi konkreetsele kuulajale, kui ehk vaid lapsele endale. Selle kõne iseäralikke tunnuseid on olnud raske selgitada, aga artikkel pakub välja, et enamik selle tunnuseid tulevadki sellest, et tegemist pole suhtlusega kellegi teisega, vaid iseendaga – ehk tegemist on autokommunikatsiooniga. Sellisena on see mõnevõrra sarnane Vögotski uuritud privaatkõnele. Niiviisi rakendatakse Lotmani kultuurilise autokommunikatsiooni käsitlus uuesti individuaalse tähendusloome tasandile, kus selle kontseptuaalsed juured pärit, sealjuures toetab seda Vögotski märgikäsitlus ning Jakobsoni kõnefunktsioonide eristumise käsitlus. Pakutakse välja hällikõne hierarhiline kirjeldus ja süstemaatiline analüüs ning selgitatakse selle eripärast, mõnevõrra luulelist ehitust ja mängulist iseloomu. Hällikõne eksternaliseerimise käigus teiseneb keeleliste tähendusloomevahendite toel lapse suhe kõneldavasse, lapse kui subjekti positsioon sellesse, mida ta välja ütleb. Lapsed reflekteerivad hällikõne toel mõtlemise ja keele üle ning modelleerivad enese jaoks loominguliselt arusaadavat, käsiteldavat ja kujuteldavat maailma.

Käesolev töö kehastab endas seega lapse semiootilise arengu käsitlust, mis seob märgiteooria ja laste kultuurilise arengu käsitlused, võimaldades nende ühendamise läbi selgitada muutusi ümbritseva maailma ja kultuurikeskkonna tähendustamise viisides, mis laste arengus aset leiavad. Sellise arengusemiootiliselt teadvustatud sünteesi tulemuseks tuleb käesolevas töös pidada nende kõneliste ja teiste kultuuriliselt tähenduslike kommunikatiivsete nähtuste iseloomu selgitamist, mis pole mõeldud kellelegi teisele, vaid iseendale, ning omaenese semiootilisele väljendusele – enesele, kui kultuuriliselt tähenduslikule nähtusele.

PUBLICATIONS

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2011–2024 University of Tartu, Semiotics and Culture Studies, doctoral studies
2016–2016 University of Lausanne (UNIL), Section of Languages and Civilizations of the Slavs and South Asia (SLAS), Switzerland, visiting doctoral student
2012–2013 Aarhus University, Center for Semiotics, Denmark, visiting doctoral student
2008–2011 University of Tartu, Semiotics and Culture Studies *cum laude* (Master of Arts in Humanities)
2003–2008 University of Tartu, Semiotics and Culture Studies (Bachelor of Arts in Social Sciences)
2003 Miina Härma Gymnasium

Selected Employment

2021–... Tallinn University, School of Humanities, curator of the Theory of Culture bachelor's programme
2019–... Tallinn University, School of Humanities, Lecturer of Cultural Theory
2014–2019 Contractual lecturing assignments and consulting at University of Tartu
2018 Contractual lecturing assignments at Tallinn University
2016–2017 MTÜ Wikimedia Eesti, Coordinator of Education Program
2010–2019 Contractual assignments at Pärnu International Society of Visual Anthropology

Supervised dissertations

Rein Meripõld, Master's Degree, 2021, (sup) Lauri Linask; Margus Ott, Inimese subjektsus ja ökoloogiline kriis Guattari mõistete raamistikus (Human Subjectivity and Ecological Crisis in Guattari's Framework), Tallinn University.
Mariia Cherezova, Master's Degree, 2019, (sup) Lauri Linask; Anti Randviir, A New Perspective on Identity Development: Integrating Erikson, Mead, and Vygotsky, University of Tartu, Faculty of Arts and Humanities, Institute of Philosophy and Semiotics.

- Mark Mets, Master's Degree, 2018, (sup) Kalevi Kull; Lauri Linask, Konventionaliseerumine graafiliste märgisüsteemide teket uurivates eksperimentides (Conventionalization in Experiments Studying the Development of Sign Systems), University of Tartu, Faculty of Arts and Humanities, Institute of Philosophy and Semiotics.
- Yoab Noray Amador Correa, Master's Degree, 2018, (sup) Peeter Torop; Lauri Linask, The Role of School Civic Ceremonies in Children's National Identity Formation in Mexico, University of Tartu, Faculty of Arts and Humanities, Institute of Philosophy and Semiotics.
- Yimeng Cui, Master's Degree, 2017, (sup) Lauri Linask; Silver Rattasepp; Mihhail Lotman, Problems of Bakhtin's aesthetics: The Name of the Rose as a critical examination of carnival, University of Tartu, Faculty of Arts and Humanities, Institute of Philosophy and Semiotics.
- Ingrid Lezar, Master's Degree, 2015, (sup) Lauri Linask; Tiit Remm, Intellectual Realism and Visual Realism in the Semiotic Analysis of Children's Drawings, University of Tartu, Faculty of Philosophy, Institute of Philosophy and Semiotics, Department of Semiotics.

Research & development related managerial and administrative work

- 2023–... President of the Nordic Association for Semiotic Studies (NASS), 2017–2023 secretary of NASS, member since 2012
- 2019–... Ekilex semiotic terminology database, Eesti Keele Instituut
- 2014–... Member of International Association for Semiotic Studies (IASS-AIS)
- 2013–... Member of International Association for Cognitive Semiotics (IACS)
- 2012–... Member of Estonian Semiotics Association
- Peer reviewing for journals *Culture and Psychology*, *Integrative Psychological and Behavioral Science*, *Biosemiotics*, *Sign Systems Studies*

Selected publications

- Linask, Lauri; Magnus, Riin; Kull, Kalevi 2017. Applying Jakob von Uexküll's concept of umwelt to human experience and development. In: Mey, Günter; Günther, Hartmut (Eds.). *The Life Space of the Urban Child: Perspectives on Martha Muchow's Classic Study, 177–194*. New York: Routledge. (First published by Transaction Publishers).
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Linask, Lauri; Magnus, Riin (Ed.) (2016). Special issue: Framing nature and culture. *Sign Systems Studies* vol. 44 (1/2). Tartu: Tartu University Press.

Acknowledgment

- 2021 Tallinn University recognition for implementing the vision “I change learning”.
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2008–2011 Tartu Ülikool, semiootika ja kultuuriteooria *cum laude* (humanitaarteaduse magistrikraad)
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Mariia Cherezova, magistrikraad, 2019, (juh) Lauri Linask; Anti Randviir, A New Perspective on Identity Development: Integrating Erikson, Mead, and Vygotsky (Uus vaatenurk identiteedi kujunemisele – Eriksoni, Meadi ja Vygotski lähenemiste integreerimine), Tartu Ülikool, Humanitaarteaduste ja kunstide valdkond, filosoofia ja semiootika instituut.
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- Yoab Noray Amador Correa, magistrikraad, 2018, (juh) Peeter Torop; Lauri Linask, The Role of School Civic Ceremonies in Children's National Identity Formation in Mexico (Aktuste roll laste rahvusliku identiteedi kujunemisel Mehhikos), Tartu Ülikool, Humanitaarteaduste ja kunstide valdkond, filosoofia ja semiootika instituut.
- Yimeng Cui, magistrikraad, 2017, (juh) Lauri Linask; Silver Rattasepp; Mihhail Lotman, Problems of Bakhtin's aesthetics: The name of the rose as a critical examination of carnival (Probleeme Bahtini esteetikas: „Roosi nimi“ kui kriitiline uurimus karnevalist), Tartu Ülikool, Humanitaarteaduste ja kunstide valdkond, filosoofia ja semiootika instituut.
- Ingrid Lezar, magistrikraad, 2015, (juh) Lauri Linask; Tiit Remm, Intellectual Realism and Visual Realism in the Semiotic Analysis of Children's Drawings (Intellektuaalne ja visuaalne realism laste joonistuste semiootilises analüüsis), Tartu Ülikool, Filosoofiateaduskond, Filosoofia ja semiootika instituut, Semiootika osakond.

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Valik teadustöid

- Linask, Lauri; Magnus, Riin; Kull, Kalevi 2017. Applying Jakob von Uexküll's concept of umwelt to human experience and development. In: Mey, Günter; Günther, Hartmut (Eds.). *The Life Space of the Urban Child: Perspectives on Martha Muchow's Classic Study*, 177–194. New York: Routledge. (First published by Transaction Publishers).
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- 2021 Tallinna Ülikooli tunnustus visiooni “Mina muudan õppimist” silmapaistva rakendamise eest.
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