

This is an English translation of the **preprint** article Kasper/Hoffmeister (2023), *Philosophische und sprachtheoretische Herausforderungen an den Begriff der mentalen sprachlichen Repräsentation*. Translation was assisted by DeepL.

Philosophical and linguistic challenges to the concept of mental linguistic representation

Simon Kasper* & Toke Hoffmeister#

*Institute for German Studies, Heinrich-Heine-University Düsseldorf

#Forschungszentrum Deutscher Sprachatlas, Philipps-University Marburg

03/2024

1 Introduction	1
2 Vanishing points: modeling the mediating function of mental (linguistic) representations	2
2.1 Mediation in the integrated cycle of action.....	2
2.2 The mental and representation.....	7
2.3 Modeling something with an in-order-to motif.....	9
3 Important dimensions and characteristics of mental (linguistic) representations	10
3.1 Concepts of representation.....	10
3.2 Enter the Matrix	11
4 The mediality of mediation in the integrated cycle of action.....	15
4.1 Conditions of mental representation in the integrated cycle of action.....	15
4.2 Formats of experience and the supermediality of linguistic representations	18
5 Concluding remarks.....	28
6 References	29
7 Internetressourcen.....	32

1 Introduction

Our contribution pursues two goals: On the one hand, we would like to formulate fundamental challenges to the concept of mental (linguistic) representation and, on the other hand, offer general suggestions for its modeling.¹ In the context of the first goal, we will approach the concept of mental (linguistic) representation by identifying its

¹ We would like to thank all *Principal Investigators* and doctoral students of the Research Training Group 2700 for the discussions that contributed to this article. Simon Kasper would also like to thank Jürgen Erich Schmidt and Ralf Becker for further discussion. We, the authors, are solely responsible for any inadequacies.

functional place in the relationship between humans and their environment² in the context of their everyday life (Section 2). In doing so, we want to avoid the mistake of defining the concept so narrowly by means of preliminary decisions that certain modeling results are already predetermined or certain others excluded. In the aforementioned environmental relationship, sensory perception and the physical and cognitive behavior and actions of humans, including linguistic activities, take on central functions. We will assign mental (linguistic) representations a mediating role between perception and physical and cognitive action/behavior, or, to put it more succinctly, between impression and expression.

Against this background, we then take up some central, partly disparate representational properties from the research literature and formulate challenges to the concept of representation in their context (Section 3).

Our second aim is to make some general suggestions for answering the fundamental question by referring back to the mediation concept of representation and the discussion of the challenges: What kind of notion of representation is required to understand and explain the specific (linguistic) capacity for action that human beings display in the practical conduct of life? Here we will address, among other things, the "medium" or "format" or the "media" or "formats" of mental (linguistic) representations. Drawing on a symbolic and media-philosophical tradition of thinking about representations, we will make mediating suggestions for disparate ideas of representation (section 4).

2 Vanishing points: modeling the mediating function of mental (linguistic) representations

In order to avoid having to formulate overly general challenges to a concept of representation in a theoretical vacuum, we will begin by setting out the conceptual vanishing points of our further explanations.

2.1 Mediation in the integrated cycle of action

Our approach to the concept of mental (linguistic) representations consists in the question of *which psychological conditions must be present in order for people to be able to act (linguistically) in a specifically human way in the practical conduct of life*. The question is characterized by a basic assumption that could be described as human-ecological. According to this, perception on the one hand and action and behavior on the other are in a reciprocal relationship of service: What is perceived is meaningful with regard to behavioral functions and purposes of action, and behavior and action are in turn meaningful with regard to the resulting constellations of perception. Reality phenomena are meaningful for people insofar as they enable sensible behavior and action. Sensible

² "Environment" is to be understood here in an everyday linguistic sense and not in the sense of a biological concept such as the ecological niche or Jakob von Uexküll's concept of *Umwelt*. The environment here is therefore that which is experienced and experienceable in the human conduct of life.

This is an English translation of the **preprint** article Kasper/Hoffmeister (2023), *Philosophische und sprachtheoretische Herausforderungen an den Begriff der mentalen sprachlichen Repräsentation*. Translation was assisted by DeepL.

behavior is behavior that serves vital interests in the face of situational challenges (e.g. physical integrity, food, reproduction) and primarily addresses humans as natural beings. Ideally, behavioral stimuli occur under the same observable conditions in the same observable way and these processes can, in principle, be captured in statements of natural laws. Sensible action is that which appeals to people as cultural beings who, in the face of situational challenges, have autonomy of purpose and rationality of choice. Action ranges from controlled and attentive to highly routinized without attention, but it can be refrained from or interrupted at any time. It cannot be predicted by scientific laws of progression [*naturwissenschaftliche Verlaufsgesetze*] (or explained ex post) (cf. Hartmann 1993, 1996, 1998).³ In the spiral of impression (perception) and expression (behavior/action) and (novel) impression etc., mental (linguistic) representations can *mediate*: They mediate between what the organism is confronted with and how it reacts (behavior) or acts (action) in the face of this (cf. Kasper 2020). These connections can be further substantiated by presenting an organism as a hypothetical boundary concept, which, with its organismic form, is completely absorbed in the unmediated cycle between perception and mere behavior and is not dependent on mental representations (Fig. 1).

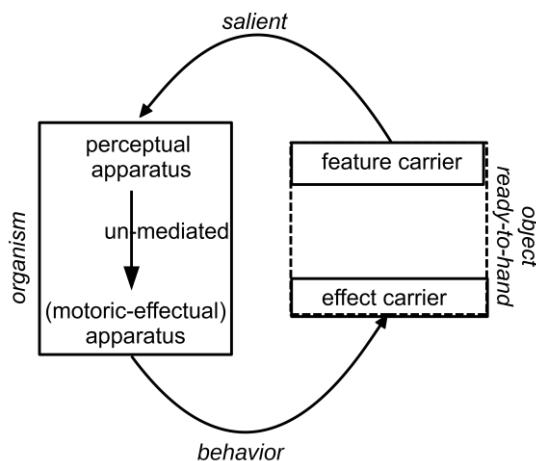


Figure 1: Cycle of behavior (adapted version from Kasper 2020: 249)

Such an *organism* would occupy an ecological niche in which its *perceptual apparatus* and its *motor-effectual apparatus* are correlatively attuned to one another. It would perceive precisely those sections, spectra and aspects of its environment (the *feature carriers*) that would allow it to influence these sections, spectra and aspects (*effect carriers*) with its motor repertoire in such a way that its vital primary functions would be fulfilled (e.g. food, reproduction, brood care). These vital primary functions also form the (only) criteria in relation to which environmental aspects would be "evaluated" in perception for behavior, and the behavioral stimuli in the service of vital functions would be the only ones available (cf. Uexküll 1973). Certain constellations of stimuli would then always be transformed into

³ If action could be explained according to the laws of nature, this would also apply *mutatis mutandis* to the act of explanation itself. This would make an explanation the result of processes determined by natural law. However, this would also apply to any other explanation, including competing explanations, so that there would no longer be any rational criteria of validity for scientific statements.

certain, largely automatic, vital behaviors in an immediate (i.e. *unmediated*) manner. The environmental excerpts would not form a representational world for the organism, in which the objects would exist independently of the organism and its vital needs in and of themselves. (For this to be the case, the organism would have to be able to disregard the sum of all possible aspects of a perceptual phenomenon). Sensitivity to certain characteristics and effects would therefore not lead to an integrated and detachable concept of the object, but the environment would always appear in the light of its function of satisfying needs, as something that is *ready-to-hand* (cf. Heidegger 1967, Plessner 1975, Cassirer 2010). We call the relevant characteristics in this regard *salient* (cf. Purschke 2011, 2014, Kasper 2015, 2020, Kasper & Purschke 2023). The described behavioral cycle then consists of the fact that salient stimuli are constantly and immediately converted into behavioral reactions in the waking state.

The mediating function of mental (linguistic) representations in psychological and philosophical theorizing can be well explained by contrasting the mode of existence of higher organisms, especially the human one, with the one explained. Their characterization must do justice to the human being both as a natural being, which has comparatively weakly developed sensorimotor (somatic) automatisms with vital functions,⁴ and as a cultural being, which variably evaluates perceptions with regard to self-imposed, culturally relative purposes of action. These purposes of action can then be realized using means–ends rationality, be it non-linguistic or linguistic action.

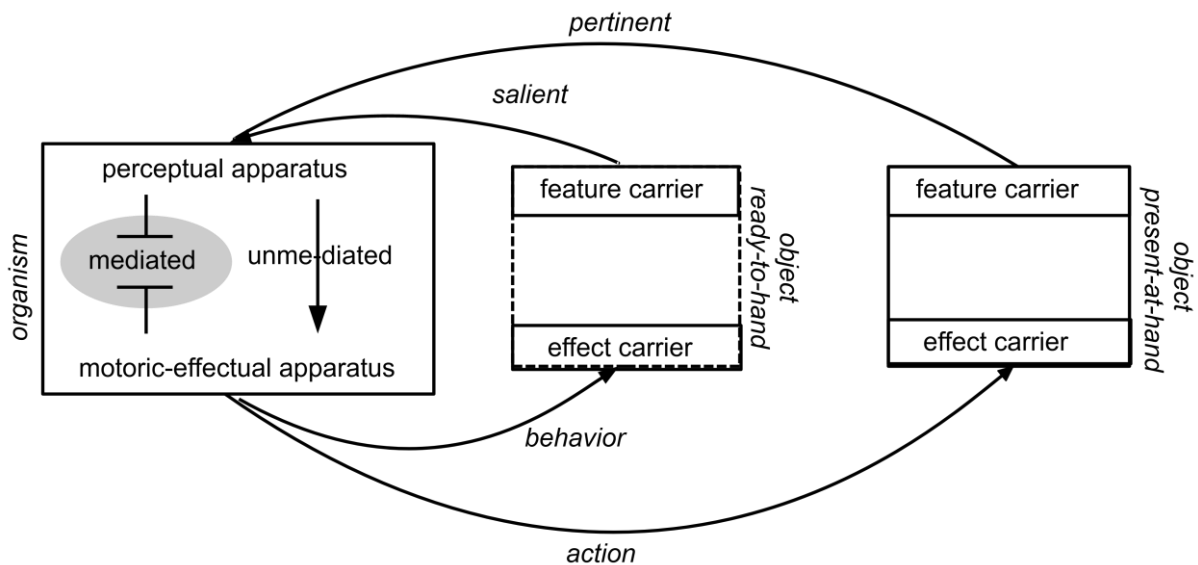


Figure 2: Cycle of action integrating the cycle of behavior (in gray the functional locus of mental representations) (adapted from Kasper 2020: 251)

In contrast to the organism depicted as a borderline case in the behavioral cycle, more complex organisms, and especially humans, do not conform to the unmediated sequence of perceptual and behavioral processes and altered perceptual processes, etc. Rather, humans constantly pursue self-imposed superordinate (e.g. doing a doctorate) and

⁴ These would be those that could be described and explained using scientific laws of progression.

This is an English translation of the **preprint** article Kasper/Hoffmeister (2023), *Philosophische und sprachtheoretische Herausforderungen an den Begriff der mentalen sprachlichen Repräsentation*. Translation was assisted by DeepL.

subordinate purposes (e.g. putting on pants), which are usually highly indirectly related to their present perceptual phenomena (e.g. the coffee machine in the institute kitchen) and which as such require *mediation* together with their realization. This means that what is perceived does not automatically trigger behavior aimed at maintaining vital functions on the basis of salient, accessible characteristics, which would lead directly to the next such perceptual situation and this to the next automatic behavior (cf. Plessner 1975, 2017, Gehlen 1995). Rather, people pursue self-imposed purposes in *action* and it is them that predetermine a specific pertinent aspect of a perceptual phenomenon from a multitude of possible regards. Thus, regardless of purpose, a pants are initially not pants, but something indeterminate with a range of sensory qualities that have more or less salience potential for people and can become meaningful. Only a purpose of action leads to treating it *as* something definite (*as*-relation). If you want to wipe something up, certain features become pertinent (the material suggests absorbency), if you want to tidy up, others become pertinent (the material and the shape suggest collapsibility) and if you want to dress, others again (the shape and the fabric hollows that are wondrously reminiscent of two legs). And this is the normal situation: People evaluate perceptual situations relative to their purposes of action, which may lie far beyond these situations in terms of space and time (doing a doctorate, celebrating a birthday, shopping for pizza) and proceed to realize them in a planned and rational manner by dealing with concrete perceptual phenomena. In the sequence of actions that he performs for this purpose, he confronts himself with objects (e.g. the coffee machine) and their pragmatic features (e.g. the water tank), which are part of the plan and thus become *pertinent* (and expected) (cf. Kasper 2015, 2020). The behavioral cycle of the organism, which we introduced above as a hypothetical boundary concept and which is completely absorbed into the behavioral cycle, is embedded in the human action cycle more as a disruptive factor: Where something unexpected, surprising happens within the cycle of action (a sock clogs the trouser leg when slipping in, someone utters a word in an unexpected way, a stone pokes through the sole of the foot when stepping on it), this *befalls us* in our course of action. The corresponding stimuli are *salient* and lead to an unmediated, automatic behavioral response (faltering, *Huh?*, shifting balance). But after just a few hundred milliseconds, the person identifies this disturbance *as* an obstructing sock or *as* a language variant of the other person and, if necessary for his ability to act, transforms the formerly salient stimulus into a pertinent stimulus by inserting it into his superordinate action plan (put on pants, communicate successfully, ensure safe continuation for himself and others) under a certain pragmatic regard as a sub-purpose (remove sock from pants leg, adopt/reject variant, kick stone away). This means that due to the fact that the content of their perception is not fixed to salient characteristics and due to their lack of automatic behavioral patterns adapted to perceptual situations, humans are creatures of action and are dependent on constantly converting the salient stimuli of their experiences of getting befallen into pertinent ones. We have to imagine the loops in the integrated cycle of action that are constantly being traversed as ranging from milliseconds (stepping on a sharp stone and shifting the weight) to years (doing the doctorate) (cf. Kasper 2021). Humans

can recognize what they perceive from various pragmatic points of view and yet know that what they perceive also exists as an object in and of itself independently of their views, which have been narrowed down according to practical interests. They are thus confronted with a world of objects in which things exist not only as objects related to their interests, but also independently of them as objects *present-at-hand*.

Mental (linguistic) representations are now, in a first approximation, scientific construct(s) with which, in view of the fundamentally mediated connection between what people perceive and what people do in action and behavior, the meaningfulness of action and behavior is attempted to be understood and explained. There is an explanatory gap between perception and action in the action cycle (gray ellipse in Fig. 2), in which this mediation is to take place with the help of mental (linguistic) representations (for the role of mental representations in action vs. behavior, see below). The everyday linguistic and practical concept of purpose is already one that, as soon as it is to be taken into account in the psychological model, is given its functional place in this explanatory gap. For the most part, mediation consists in the fact that, *depending on pragmatic motives*, concrete perceptual content is recognized *as something specific* and becomes effective as *such*, instead of being recognized as something else that could have led to other actions. Humans act and behave more from mental mediations, which are largely practical, social, technical and cultural, than from perceptual constellations that predetermine their behavior through their salience in an unmediated manner. With the concept of representation, research meets two challenges that emerge from the above discussion:

1. Unlike other world contexts, human (linguistic) action cannot be reliably predicted (understood, explained) on the basis of observable situational conditions and known laws of progression (cf. Hartmann 1993).⁵
2. The concepts that are available for the (partial) explanation and understanding of specifically human (linguistic) behavior and (linguistic) action and are (partly) indispensable for this belong to an everyday language vocabulary with mental and practice-related expressions (*want, mean, intend, plan, feel, fear, hope, take responsibility for, remember, imagine, accuse, etc.*; cf. Bennett & Hacker 2015).⁶

The above statements already contain what we consider to be an inescapable requirement for a concept of mental (linguistic) representation or the mediation service that it is supposed to provide: The role that mental (linguistic) representations play for humans can only be adequately considered against the background of their entire environmental references, i.e. within the framework of their lifeworld practice shaped by the pragmatic motif (cf. Schütz & Luckmann 2017), in which they participate as a whole person (cf. also the language world concept in Hoffmeister 2021). This includes the distinction between action and behavior. Where these relationships are cut off methodologically or ontologically (reductionism), the results of research conducted in this way cannot

⁵ This may lead to the question of whether this is necessarily or contingently impossible. We deliberately refrain from this discussion here, as it goes beyond the scope of this article and has no direct relevance to what follows.

⁶ More on this in the next section.

This is an English translation of the **preprint** article Kasper/Hoffmeister (2023), *Philosophische und sprachtheoretische Herausforderungen an den Begriff der mentalen sprachlichen Repräsentation*. Translation was assisted by DeepL.

therefore be legitimately interpreted afterwards as applying to the whole person in the totality of their relationships and to life-world practice shaped by the pragmatic motif (cf. the discussions on reductionism in Bennett & Hacker 2015, 2021, Werbik & Benetka 2016).

2.2 The mental and representation

Further challenges concern the concepts of the mental and the representation. For the sake of simplicity, we will treat *psychic* and *mental* as synonyms. First of all, it should be noted that expressions for mental states and processes in everyday life are, if not indispensable, then at least functionally highly loaded (i.e. utilized). This finding stands in striking contrast to attempts, especially since the linguistic turn, i.e. for over a century, to "naturalize" the mind (psyche), i.e. to explain it in purely scientific terms and thus also in terms of laws of progression. The spearhead of these attempts is formed by some movements in the analytical philosophy of mind in conjunction with some movements in the neuro(bio)- and cognitive science. In the course of these attempts, the relationship between mental and physical states or between their descriptions is interpreted in different ways, including in analytical behaviorism, functionalism, eliminative materialism, identity theories and supervenience theories.⁷ With regard to such attempts, the following can be stated: Those approaches within the aforementioned movements that have attempted to reduce mental processes and states in general to non-mental (material, bodily, physiological) ones have not succeeded, either philosophically or empirically, in an intersubjectively accepted or trans-subjectively acceptable way, in tracing them back to the latter, proving them to be epiphenomena of the latter or proving the former to be identical with the latter. Such attempts all have serious philosophical problems and the naturalistic claims are also empirically far from being realized.⁸ In our opinion, it would be premature to abandon the irreducibility of the mental in the context of the *explanandum* outlined above. Words for mental events will not be replaced without loss by words for non-mental events (in relation to the efficient functional load) in the foreseeable future.

In order to move from the concept of the mental to that of representation, the interpretation of the concept of representation is often explicitly (more in philosophy) or implicitly (more in the empirical sciences and humanities) based on philosophical assumptions about the nature of the relationship between mental and non-mental (material, bodily, physiological) processes and states (cf. Demmerling & Schröder 2021). For example, the explicit or implicit assumption that every mental process corresponds to

⁷ The *Stanford Encyclopedia of Philosophy* (Zalta & Nodelman, n.d.) offers thematically wide-ranging overview articles on analytic philosophy of mind. However, criticism from outside the overarching paradigm is rarely to be found. On behaviorism (including analytic behaviorism) see Graham (2023), on functionalism see Levin (2023), on eliminative materialism see Ramsey (2022), on identity theory see Smart (2022), on supervenience theories see Stoljar (2024), on epiphenomenalism see Robinson (2023).

⁸ See Hartmann (1993, 1998), Sturma (2005), Janich (2009, 2010, 2014), Bennett & Hacker (2015, 2021), Werbik & Benetka (2016).

a bodily (e.g. neuronal) process, but that in the cycle of impression and expression (and impression, etc.) only the latter is causally effective, can lead to “mental” representations being spoken of in a way that does not refer to mental (psychological) entities, but to bodily (e.g. neuronal activity patterns). Mental representations are then understood as “neuronal representations”, for example, since the mental is actually nothing other than the physical or its epiphenomenon or, alternatively, nothing at all. These treatments of the mental are problematic for at least two reasons: The first is the one mentioned above, since this relationship of the mental to the non-mental is philosophically problematic and “merely” programmatic, but is by no means a generalizable result of inductive scientific research. The second objection is that this treatment is dependent on the semantic vagueness of *representation*. A representation requires something that represents, something that is represented, and someone or something for whose action or behavior this relationship between the represented and the representing is relevant *as* a representational relationship. The assumption that a bodily (e.g. neuronal) process “represents” something to be represented (an experiential content) in an analogous way to how a mental representation “represents” something, but that the bodily process is the actual representation, since only it is causally relevant, amounts to the naturalistic reductionism of the mental to the non-mental criticized above. Moreover, according to the basic idea of mental representation, that which represents should “stand for” the represented (cf. Pitt 2020). It is a kind of *making something present mentally* (more on this below). However, this is a relationship of a completely different semiotic kind than that between bodily processes on the one hand and what triggered them, or the experience they accompany, on the other. Only if it can be assumed that every (specific) mental process (type) is completely determined by a certain (bodily, e.g. neuronal) process (type) and vice versa, could one speak of neuronal representations instead of mental ones. However, this prerequisite is not given for the reasons mentioned. Now it could be objected that extensions of meaning such as applying the concept of representation to physical states and processes (as representations) are unproblematic as long as one is aware of the semiotic difference. This is correct in principle, but the path from polysemy to ignoring the semantic difference in (then invalid) argumentative chains of inference is short and has already been taken many times (cf. Bennett & Hacker 2015, ch. 3.2; Bennett & Hacker 2021).

We would like to conclude this section by tentatively tracing the chain of conclusions which, in our opinion, has led to positions that prematurely reduce the mental to the non-mental, and further that statements on the mental have even been made dependent on statements on the physical regarding justification. We will refer back to this in later sections.

- I. The unpredictability of human action from environmental conditions leads to the assumption of mental representations mediating impression and expression as something that makes something mentally present [*als Vergegenwärtigungen*]. (We accept this assumption.)

This is an English translation of the **preprint** article Kasper/Hoffmeister (2023), *Philosophische und sprachtheoretische Herausforderungen an den Begriff der mentalen sprachlichen Repräsentation*. Translation was assisted by DeepL.

- II. For mental events accompanying neuronal processes or correlates are observed. (We accept this assumption.)
- III. The naturalization programme in scientific disciplines leads to a levelling of the difference between action and behaviour. (We have declared this difference to be inescapable above [Section 2.1]).
- IV. The unpredictable human activities are subsumed under behavior while the idea of mental representation and its neuronal accompaniment is retained. (We therefore reject this subsumption).
- V. By not separating action and behavior, the mental (re-)presentations originally attributed to action are transferred to behavior, because the subsumption of action under behavior has not made it less complex. (We also reject this transfer.)
- VI. Since the concept of the mental no longer coincides with what is actually made mentally present [*mit dem Vergegenwärtigten*] following this transfer, the mental undergoes a conceptual extension from what is made mentally present to what is mentally non-present (and mentally non-presentable). (Here we will argue for a conceptual separation).
- VII. Mental events are proclaimed (namely for the behavioral activities as opposed to action), for which only scientific observation data are available, but no experiences (mental [re-]presentations [*Vergegenwärtigungen*]). (The same applies to this proclamation as to VI).
- VIII. In the resulting situation, it seems that each making something mentally present [*Vergegenwärtigung*] has a bodily correlate, but that there are bodily events even when behavior is sensible but nothing is mentally present. Thus, the mental is explained as dependent on the bodily, e.g. neural. (We reject this assumption.)
- IX. When talking about mental representation in the absence of experiences of mental presence, ways of speaking are sometimes used that lead to conceptual confusion (equivocations, metaphorical/metonymic use of mental vocabulary as in mereological fallacy; replacement of mental by physical vocabulary). (In relation to reductionist approaches, this is the problematic Now described above).

2.3 Modeling something with an in-order-to motif

Up to this point, we have derived mental representations as scientific constructs as our vanishing point, with which irreducible mental representations of experiences are modeled within the framework of the integrated cycle of action. This should serve as a prerequisite for the discussion of more concrete properties of the modeled mental (linguistic) representations. In this context, we would like to briefly address the question of how models of mental (linguistic) representations can prove their worth. Our answer is: by realizing instrumental purposes with these models. In other words, the practical purpose for which something is modeled provides the criteria for judging whether the

This is an English translation of the **preprint** article Kasper/Hoffmeister (2023), *Philosophische und sprachtheoretische Herausforderungen an den Begriff der mentalen sprachlichen Repräsentation*. Translation was assisted by DeepL.

modeling is adequate and its description is true.⁹ Scientific modeling thus (ultimately, but not necessarily directly) has the function of supporting everyday practices and this is where they can (ultimately, but not necessarily directly) prove themselves by being used for this purpose (cf. Hartmann & Janich 1996, Janich 2014).¹⁰ In general, psychological and cognitive science theories can thus serve as a means of practical troubleshooting. Examples are the alleviation or elimination of pathological phenomena or of communication problems or the construction of technical artifacts that are helpful in this respect. This is also the point at which the methodological or ontological reductions, homogenizations and idealizations can be tested for their legitimacy, because the successful and effective support of everyday practices involves no less than the human being against the background of his entire environmental relations, i.e. within the context of their life-world practice shaped by the pragmatic motif, in which they participate as a whole person (see above, section 2.1).

3 Important dimensions and characteristics of mental (linguistic) representations

3.1 Concepts of representation

Various concepts of mental representation circulate in the literature. In the narrower sense, the term stands for a concept of first-generation cognitive science and, more precisely, the computational theory of mind (for an overview, see, for example, the anthology by Schlicht & Smortchkova 2018). This has been advocated since the 1950s and is based on one (or, depending on the type of cognitive activity, several) language(s) of the mind, which is (are) characterized by a logical syntax of arbitrary symbols and can encode compositional meanings, i.e. refer to something (intentionality). This (these) language(s) of the mind are not to be confused with natural language, which is regarded as logically deficient.¹¹ Such a concept of representation ascribes a narrow conceptual scope to both *mental* and *representation*: The mental is limited to the "higher" "mental" contents and activities such as memory, language and problem solving, i.e. to discursive, intellectual thinking and the corresponding thoughts. According to this position, *representation* refers to the exclusively symbolic format of such thoughts. The functional area of this concept of representation is conspicuously detached from all sensual, affective, physical and practical aspects of the human form of life.¹²

In an extensively broader sense and as a result of its discursive success, the term mental representation is today also applied to older and more recent concepts in psychology and philosophy, including 'concept', 'percept', 'imagination', 'apperception', 'notion' and 'idea'. This broader sense is characteristic of at least a second, post-

⁹ On "models for something" versus "models of something", see Gutmann (2005: 407-409).

¹⁰ For a response to the objection that this undermines the noble idea of purposeless truth and why the reference to the correspondence between theory and reality is a deficient justification, see Janich (2014, esp. Ch. IV).

¹¹ Here, one place of origin of the computational theory of mind becomes clear in the efforts of the philosophy of science in the late 19th century to replace the vagueness and ambiguities of natural languages with logical symbol systems for the purpose of exact scientific description and analysis (cf. Frege 1879).

¹² He is therefore accused of having strong Cartesian traits (cf. Bennett & Hacker 2015).

This is an English translation of the **preprint** article Kasper/Hoffmeister (2023), *Philosophische und sprachtheoretische Herausforderungen an den Begriff der mentalen sprachlichen Repräsentation*. Translation was assisted by DeepL.

computationalist generation in the cognitive sciences, which takes at least sensory perception and the physicality of the human being more seriously as factors that shape the form of mental representations (embodiment). The mental is defined less restrictively and, in addition to the “higher” cognitive activities, sub-processes of perception and emotions are also included, for example. The same applies to the “format” of representation, which is no longer limited to the logical syntax of a symbolic language of the mind, but also allows for “pictorial”, i.e. topological “formats” that are not symbolic-arbitrary, but inherently meaningful.

In linguistics, this generational difference only became relevant after another separation, in which Chomsky marks the turning point. Before Chomsky, language was studied as behavior, action, a social entity, a virtual entity, to which psychological aspects were certainly also appropriate (e.g. Wundt, Wegener, Bühler), but with Chomsky, essential aspects of language were cognitized and declared autonomous (grammatical competence), and linguistics was assigned to psychology as a sub-discipline (cf. Chomsky 1973). It is only within this latter conception of language that the above-mentioned generational difference is now reflected, namely in the rough division between two research paradigms: on the one hand, so-called mainstream generativism (an exonym of Jackendoff), which comprises the approaches developed by Chomsky himself in their historical sequence, as well as other theoretical approaches that (also) understand linguistic representations as abstract-symbolic and more or less strictly modularly organized with interfaces (e.g. phonology vs. morphology vs. syntax vs. lexicon vs. semantics vs. Phonology vs. morphology vs. syntax vs. lexicon vs. semantics vs. pragmatics vs. information structure etc.);¹³ on the other hand, cognitive-functional linguistics in the wake of Langacker and Lakoff, which rejects modularity and the language(s)-of-mind symbolism in favour of linguistic representations that are organized according to principles that they share with other cognitive abilities and that can also have a pictorial or topological character.

The above classification is rough, has transitional areas and intersects with numerous other philosophically, psychologically and linguistically controversial pairs of opposites whose manifestations cannot always be clearly attributed to one or the other major position. Some of these are included in the matrix below, others will be discussed separately.

3.2 Enter the Matrix

In the following, we will present a representation matrix in which important representational features from the research discussion are arranged in different dimensions (see Table 1). This matrix and the following explanations are intended to provide theoretical orientation in the discussion of mental (linguistic) representations and at the same time serve as a reference point for the discussion of challenges. In Table

¹³ Cf. Müller (2023) for a comprehensive overview of theories that are symptomatically abstinent in terms of philosophy of science. For a more reflective presentation of Chomsky's approaches and some "competitors" such as the LFG, see ten Hacken (2009).

This is an English translation of the **preprint** article Kasper/Hoffmeister (2023), *Philosophische und sprachtheoretische Herausforderungen an den Begriff der mentalen sprachlichen Repräsentation*. Translation was assisted by DeepL.

1, the dimensions are in bold, the characteristics within the dimensions are in italics and the short texts explain the characteristics.

1. Formation	
<i>learned</i>	<i>inherited</i>
RX arises in the confrontation with world impressions and other holders of RX and is thus ontogenetically formed (phenotype). Essential characteristics of RX are not preformed at birth.	RX is already biologically passed on in the act of reproduction and is thus preformed (genotype). Essential characteristics of RX are preformed at birth.
2. Chronicity	
<i>processual</i>	<i>static</i>
RX has duration / takes time / is extended in time.	RX is present as an integrated unit at all times.
3. Pragmaticity	
<i>purpose-/function-dependent</i>	<i>purpose-/function-independent</i>
RX is formed in the face of each concrete situational action/behavioral task.	RX exists independently of a concrete situational action/behavior task.
4. Differentiability	
<i>discrete</i>	<i>continuous</i>
(The form of) RX is sharply delimited from other Rs by alleged necessary and sufficient criteria.	(The shape of) RX is distinguished from other R by continuous transitions.
5. Order	
<i>systematic</i>	<i>diffuse</i>
The form / content / function of RX is / are strictly limited by the form / content / function of other R (cf. negative definition of elements in systems).	The form / content / function of RX is / are freely configurable in their content and scope.
6. Format	
<i>symbolic</i>	<i>modal</i>

This is an English translation of the **preprint** article Kasper/Hoffmeister (2023), *Philosophische und sprachtheoretische Herausforderungen an den Begriff der mentalen sprachlichen Repräsentation*. Translation was assisted by DeepL.

RX has an abstract symbolic format.		RX has a imagistic format based on the functioning of sensory modalities.	
7. Generality			
<i>Category/Schema</i>		<i>Member/Exemplar</i>	
RX is general and the representation of a class, the general or common characteristics of its instances.		RX is specific and represents individuals or the individual characteristics of the instances of a class.	
8. Epistemicity			
<i>explicit knowledge, Knowing-that</i>		<i>implicit knowledge, Knowing-how</i>	
The owner of RX is aware of X and can provide exhaustive and accurate information about RX. (Owner knows X and knows about X.)		RX is usually not aware of X and cannot provide adequate information about X. However, the existence of RX can be deduced from the holder's competent performance. (Holder can behave/act sensibly in relation to X).	
9. Ontology			
<i>virtual</i>	<i>ideal</i>	<i>real</i>	
RX is an artifact of analytical abstraction in the context of a particular model description.	RX is the result of idealizations concerning the functioning of the human mind and exists ideally.	RX, as described, is assumed to be psychically real in a sense to be specified.	
10. Possessivity			
<i>collective average</i>	<i>lowest collective denominator</i>	<i>collectively identical</i>	
RX, as modeled, represents an average representation for the members of a collective.	RX, as modeled, represents the lowest common denominator for the members of a collective.	RX, as modeled, represents exactly the representation of one/each individual actor.	

Tab. 1: Representation matrix (X: the [linguistic] unit in question; RX: the mental representation of X)

These characteristics are theoretically challenging – with the fundamental considerations from section 2 in the background – in that they are contrary or contradictory within a dimension from a given perspective (see explanatory texts). The logical incompatibility of representational characteristics within a dimension can have three causes:

First, it can be the result of conflicting theoretical positions (for example, generativism vs. cognitive-functional linguistics or conflicting internal positions).

This is an English translation of the **preprint** article Kasper/Hoffmeister (2023), *Philosophische und sprachtheoretische Herausforderungen an den Begriff der mentalen sprachlichen Repräsentation*. Translation was assisted by DeepL.

Secondly, a model architecture can be so complex that certain representational dimensions play a role on different levels at the same time or reappear in different phases in a process model, so that the representation of something is assigned certain characteristic values in one architectural level/process phase, but other values in the other level/phase.

Thirdly, with regard to the representation of something, different characteristics may be indicated if different views of the respective dimension of representation are chosen. Therefore, before a statement is made that a representation of something has a certain characteristic, it should be clarified in particular in which respect the representation is considered, and it should be ensured that the mental representation of something is actually being talked about and not something else:

- (i) Regarding attributions of properties to representations, a semiotic distinction should be made as to whether X is...
 - (a) a (linguistic) form,
 - (b) a (linguistic) function (valeur),
 - (c) a (linguistic) meaning,
 - (d) a (linguistic) sign (e.g. construction) comprising (a), (b) and (c),
 - (e) a (linguistic) non-sign (e.g. phoneme) comprising (a) and (b),
 - (f) a non-linguistic unit.

- (ii) Regarding the attribution of features, it should be considered whether the features...
 - (a) are actually attributed to the representation (to be modeled),
 - (b) do not belong to the observational data on which the representation (to be modeled) is based.

- (iii) Regarding questions concerning the genesis of the representation of X, one should make sure that it is actually about the genesis of the representation of X (and thereby observe point 10. of the matrix), and not about
 - (a) the ontogenesis of the individual,
 - (b) the phylogenesis of the collective,
 - (c) the glottogenesis of the linguistic element.

Points 1 to 10 in the matrix reflect different and sometimes conflicting theoretical positions. We give a few hints, which are, however, not exhaustive: Thus, in view of 1 (formation), nativist and constructivist approaches could be contrasted. In view of 2 (processuality), online and offline approaches could be mentioned. This also raises the question of whether states or processes are modeled in a theoretical model and whether processes are a sequence of states. In 7 (regarding the generality of R), exemplar and prototype approaches are opposed. In 9 (ontology) and 10 (possessivity), opposing ontological and methodological assumptions are articulated (see section 2.2), as they are reflected in various linguistic paradigms. In 9 it is also debated how much

psychologization or cognitivization is assumed. Should every result of a linguistic, e.g. distributional, analysis also be assumed to be a cognitive unit: a concrete lexeme? A syntactic rule? The difference between two sounds or phonemes? The animacy hierarchy? With regard to follow-up question i), which concerns different semiotic units, generativist, structuralist-system-theoretical and construction-grammatical assumptions will lead to different forms of what is to be understood under a) to e), as well as with regard to different semantic concepts. We believe that attempts to model mental (linguistic) representations can be made clearer if we try to locate and thus specify the representative (R) and the represented (X) against the background of the vanishing points mentioned above (Section 2) and if we take into account the matrix categories 1–10 and the follow-up questions (i)–(iii). Of course, this does not make empirical research superfluous. On the contrary, we see our explanations primarily as conceptual work that can be incorporated into the formation of hypotheses as well as into the structure, method and interpretation of the results of empirical research. Such conceptual work does not replace hypothesis-driven empirical research, but it is a necessary prerequisite for ensuring that no implicit assumptions and equivocations that have already been invested unnoticed in empirical research are later incorrectly interpreted as empirical results.

4 The mediality of mediation in the integrated cycle of action

In the following, we would like to outline our own approach to mental (linguistic) representations, which takes up and positions itself on much of what has been discussed above. Not only will the concept of representation in the sense of mediation come into play (Section 2.1), but at the same time an attempt will be made to mediate disparate representational properties from the matrix in Table 1 (Section 3.2).

4.1 Conditions of mental representation in the integrated cycle of action

We assume that there are mental representations of something that guide human action and that such mental representations of something may always be accompanied by physical, including neuronal, events.¹⁴ In our opinion, we can speak of “representation” on the mental side and of “accompanying” or “correlated” processes, procedures, schemata, patterns, etc. on the bodily (e.g. neuronal) side. However, these are not representations in the same sense as those that make something mentally present (again).¹⁵

It is controversial for which organism performances a participation of mental representations in the sense of making something mentally present is assumed. To remember something absent (in the sense of recall), to think, hope, believe, plan, design, speak about it etc. requires the making mentally present of what is remembered, planned, to be said etc., i.e. the organism (re-)presents it as such. But what about the following:

¹⁴ We make these assumptions in accordance with the action cycle in Fig. 2 and assumption II in section 2.2.

¹⁵ See section 2.2 and assumption VI there.

This is an English translation of the **preprint** article Kasper/Hoffmeister (2023), *Philosophische und sprachtheoretische Herausforderungen an den Begriff der mentalen sprachlichen Repräsentation*. Translation was assisted by DeepL.

- a. When entering the apartment, a dog skillfully steps over the step present in its perceptual field (instead of stumbling)
- b. in understanding an utterance, we treat a perceived segment as /t/ (instead of /p/) and
- c. we understand the word *bishop* in the sense of the church official (instead of the chess piece).

There is no doubt that physical (including neuronal) processes are involved in a.–c., but are mental representations of the stair step or the /t/s and the athlete meaning also involved? We mean, not necessarily, if mental representations is making something mentally present (again), because neither the step nor the /p/ nor the reading ‘athlete’ need to be made mentally present for undisturbed sensible behavior or action.

Ad a) The dog is presented with an impression complex in the behavioral cycle, including the (present!) step, the impression of which is assigned the behavioral expression of climbing over it via behavioral affordance, probably through a maturation process. For this, the dog does not have to recognize the step-thing *as* a step, i.e. by actively rejecting other determinations *as* which the step-thing could alternatively be treated.

Ad b) In the first few hundred milliseconds of human utterance comprehension, in which people move safely within the behavioral cycle, making /t/ mentally present (again) is not triggered, even less in active contradistinction to /p/ and other phoneme constructs determined by structural linguistics, but it is rather a coupling between identifiable co-textual and contextual conditions with physical (e.g. neuronal) processes which were acquired by operant conditioning. Insofar it is a mentally unmediated coupling.

Ad c) The situation is similar with lexeme comprehension. Here, we do not consider it impossible that the connection between the linguistic expression and its meaning is a highly routinized form of action that has developed during use (in contrast to mere behavior).

The above does not mean that the processes below the threshold of mental presence cannot still be modeled as mental processes, but strictly speaking they don’t involve making something mentally present and therefore have a different theoretical status than modeled mental representations in the absence of mental presence. While if something is mentally present there are real mental events – we assumed them to be irreducible above –, their descriptions as “representations” despite the absence of mental presence would be analogies or (in the sense of “stored” linguistic “knowledge”) metaphors. They would be constructs of a model logic resulting from step VII in section 3.2: One observes bodily processes correlated with certain co-texts or contexts in the laboratory, for example neuronal ones, and would like to give a mental functional description for them without there being mental experiences (see matrix: ontology: virtual).

The automatic (in the sense of behavior) or routinized (in the sense of non-attentive but interruptible action) treatment of the segment as /t/ (instead of /p/) and of bishop as ‘church official’ (instead of ‘chess piece’) can be disturbed. Behavioral stimuli that would take place under undisturbed co- and contextual conditions can take a

This is an English translation of the **preprint** article Kasper/Hoffmeister (2023), *Philosophische und sprachtheoretische Herausforderungen an den Begriff der mentalen sprachlichen Repräsentation*. Translation was assisted by DeepL.

different course due to intervening stimuli. (Routine) actions can fail in their execution and remain ineffective in terms of their purpose. Only when such disruptions occur in the integrated action cycle and a practical problem arises can the treatment of the segment and the expression lead to the mental (re-)present-ation of the segment as /p/ instead of /t/ and of the expression as a 'chess piece' instead of an 'church official' *ex post*. However, this is already the point in the integrated action cycle at which the organism steps out of the behavioral cycle and enters the action cycle via the salience of something (that which has proven to be practically problematic). The salient aspect (the incorrectly treated segment, the misunderstood expression) is thereby transferred into something pertinent via recognition-*as* involving making something mentally present.¹⁶ But this is already a new practical situation with new practical and cognitive requirements. What is simply competently performed in the undisturbed situation without mediating mental (re-)presentations (see Martix: Epistemicity: Knowing-how) gets mentally (re-)presented in the case of a disturbance in order to (re)establish the ability to act.

One could object here that in undisturbed online language comprehension, in order to "successfully treat" a segment as a certain phoneme (forgive the mixing of cognitive-psychological and structural-linguistic language games here) or an ambiguous expression in a specific meaning, one must have "stored knowledge" or "units in memory" or even "mental representations" of them, because otherwise one could not "recognize" it as such or "categorize" it successfully. This, too, can be legitimately disputed: The talk of memory as a filled container ("store"), which is accessed ("retrieve") for the purpose of comparison with what is currently perceived, is in the cases mentioned a metaphor for the fact that the organism has a matured readiness, acquired by means of behavioral learning forms, to react in a certain (mentally unmediated) way to certain cotextually and contextually specifiable perceptual constellations. Similarly, a degree of proficiency can be achieved in routinized actions so that the activities no longer need to be carried out attentively (e.g. riding a bicycle) but can be left to the execution of inattentive routines after having made the situation to be realized mentally present initially. It would then be unnecessary, if not inadequate, to assume mental representations as stored and retrieved knowledge in such contexts for each loop of the behavioral or (routine) action cycle (pulling the brake, degree of turn of the handlebar). It should be noted that the cycle takes place in the range of milliseconds. The term "knowledge" and analogously "linguistic knowledge" blurs the difference between competent performance (skill) on the one hand and having some kind of image of what is to be done on the other (see Matrix: Epistemicity: Knowing-how). The described behavior or action, as soon as the automatism "kicks in" or action is "handed over" to the routine, is something that is *done*. What is done this way and its conditions can be examined and summarized in general statements on skill. As already mentioned, it can only be described as mental and as represented in terms of a model logic based on assumptions VI and VII above – with the consequential problems outlined above. In the following, we will therefore put "representations" in which nothing is made present

¹⁶ In the role of the person making the utterance, on the other hand, one would already start in the cycle of action, based on pertinences and thus on mental representations of what is to be uttered.

mentally in quotation marks for lack of a better solution, or we will speak of them as a skill or as competent performance.

Here, too, it could be objected that "we" (seeing ourselves here as linguistic laypersons) do have concepts of certain lexemes (or rather: words) and of phonemes (or rather: letters) and of doorsteps (which, in contrast to the dog, are present and not only accessible). We agree with this, but refer to the conditions of mental (re-)presentation: Only if these things play a role in the cycle of action or when entering the cycle of action after something unexpected happens to us – as things that have to be taken into account in the practical realization of purposes, plans, designs, – then they are also mentally represented, namely in a way that is reduced to their pertinent characteristics and aspects that are necessary for this realization. In skillful, routinized, successful and effective action – even in complex, hierarchically organized chains of action – it is not necessary to make the the situation to be created mentally present in every loop of impression and impression. Making them mentally present is necessary in order to set purposes – as situations and events to be created or maintained –, and when behavior is disrupted, actions fail or are ineffective, and when actions (chains of actions) require attentive execution for their success and effectiveness.

4.2 Formats of experience and the supermediality of linguistic representations

The central ideas of our approach are part of a tradition that can be described as symbolic or media-philosophical and that ties in with Ernst Cassirer (2010, 2009, 1996), Susanne Langer (1988), Oswald Schwemmer (1997a, 1997b) and Sybille Krämer (2016). We understand the basic assumption of the tradition as follows: Mental representations make experiences of situations and events mentally present (again) (according to the restrictions just made). These mentally "simulated" experiences require pregnancy [Cassirer's *symbolische Prägnanz*] in order to mentally represent it at all. Through pregnancy they emerge from the flowing, continuous stream of experience (see Matrix: Differentiability) and this differentiation from that in which they are embedded in perceptual experience is the prerequisite for their potential to be mentally (re-)presented at all, since this (re-)presentation is a detachment of these experiences from something else. Experiences are given repeatable pregnancy by the fact that they get coupled to recurring *external*, i.e. non-mental forms during the process of acquisition or maturation (Langer 1988, Schwemmer 1997a, Krämer 2016). These forms are also sometimes called formats, symbolisms, symbolic forms or media. "Symbolic" is not meant here in an arbitrary sense, but in the sense of the binding of experiential content to some kind of external carrier. In this coupling of experiences to external symbolic forms, the formal intrinsic laws of the latter feed back to the (re-)presented experiences. This means that the experiences are also changed and shaped by the respective symbolic form by means of which they are mentally (re-)presented.

Against this background, we now consider the vocal, manually-graphic or manually-signed forms of linguistic utterances as precisely such external symbolic forms

This is an English translation of the **preprint** article Kasper/Hoffmeister (2023), *Philosophische und sprachtheoretische Herausforderungen an den Begriff der mentalen sprachlichen Repräsentation*. Translation was assisted by DeepL.

or formats to which mental (re-)presentations of experiences are linked. Our working definition is as follows:

(1) Linguistic utterances are ordered instructions for the simulated experience (in the sense of a re-enactment) of situations and events.

The simulated experience or re-enactment following linguistic utterances, or along linguistic utterances, can be of a sensory, motor, emotional, affective, cognitive, practical, poetic and artificial-symbolic nature. These – in the broadest sense mental – processes of understanding an utterance therefore consist of comprehending what is said with this utterance in the aforementioned modes of experience. “Re-enactment” is not to be understood in the sense of any kind of comprehension, for example in a symbolic language of the mind, but in the literal sense of carrying out what is given in the utterance (hence the Heideggerian hyphen in “re-enactment”). In this sense, the simulated experiences are modal (see matrix: format).

The orderliness of the simulation instructions can be described as a grammar if they are understood statically and not as a dynamic execution of instruction or comprehension (see matrix: chronicity). The ability to simulate experience or to re-enact something along sensory, motor, etc. lines is, as a skill (matrix: epistemicity: knowing-how), dependent on the degree to which that what is expressed in the utterance is covered by experiences made in the corresponding modes, i.e. to the extent to which one can “fall back” on one’s own experiences with what is said in one or more of these “formats” in the course of its simulation, or re-enactment. The understanding of utterances, and the meaning something when uttering something, covary in their “breadth” and “depth” of understanding or meaning with the experiential covering of those who understand or mean it, respectively. The concept of breadth of understanding refers to the breadth of the modes of experience involved in making experiences. Have I heard others perform the double loop jump in figure skating? Did I observe it? Have I performed it myself with all my senses? Or do I only know it only second-hand through linguistic description? The concept of depth of understanding arises from the specifically human proficiency structure of experience: Because linguistic utterances instruct us to simulate the re-enactment of what is said in them, they “appeal” to our re-enactment resources. These are the ones in Table 1 and they do not constitute an unstructured set, but a stratification of performance, with the lowest level in 1:

Experience layer		Impression experience (Perception)	Expression experience (action, behavior)
1	Anthropomorphicity of the body	[embodiment as the basic	[embodiment as the basic constitution of all

		constitution of all experience]	experience]
2	sensory-motor perception/motoric-effectual cycle	involved visual, auditory, tactile, haptic, gustatory, olfactory, proprioceptive, viscerosensitive impressions; emotional, affective processes	direct motor schemata: "practices", (behavioral impulses)
3	perception/motoric-effectual cycle with organ-expanding and -surpassing artifacts (tools, musical instruments, etc.)		instrumental-direct motor schemata: "techniques", (behavior)
4	perception/motoric-effectual cycle with organ-replacing artifacts (devices, apparatuses, power plants, etc.)		instrumental-indirect motor schemata: "technical practices", (behavioral stimuli)

Table 1: Layers of meaningful experience and their respective forms of impression and expression

Regarding layer 1: One should not imagine the perceptible environment for a small child as being well-structured in the same way as it is for competent adults. The fact that reality appears to us structured in objects, features, situations and events is the result of development. These clear and distinct entities in vision, audition, etc. are not something we can assume toddlers have. Let us first imagine that as a toddler we are dealing with a perceptual object in the broadest sense (before we have something like object concepts) and it is what is for adults a small branch. In this case, the way in which the toddler experiences it and what kind of experience they may make with this something is already determined by their specifically human physical constitution. This includes the constitution of its sensory organs, for example the stereoscopically, forward-facing eyes, the frequency ranges of what they can see and hear, and the nuances of smell that they can distinguish. On the more active side, this includes the body shape with two legs for upright walking and two arms and hands, each of which has four fingers and an opposed thumb, so that this alone gives reality the character of graspability, it includes the influence of gravity on the body and so on. This, and precisely this, type of bodily gestalt helps to determine which experiences a child can make with the branch-something and in what way, and in what qualities it can become meaningful for the child (matrix: formation: inherited).

Regarding layer 2: Furthermore, it is of course precisely this body gestalt with which the child enters the action/behavior cycle as an organism and makes the corresponding perceptual (impression) and motor-effectual (expression) experiences

This is an English translation of the **preprint** article Kasper/Hoffmeister (2023), *Philosophische und sprachtheoretische Herausforderungen an den Begriff der mentalen sprachlichen Repräsentation*. Translation was assisted by DeepL.

(matrix: formation: learned). They will grasp the branch-something *in direct contact*, which is not yet clearly and distinctly differentiated from other things prior to the sensorimotor contact, they will put it in their mouth, smell it, move it, hit and scratch themselves with it and other things. In this way, they “work through” the branch directly with all its senses, like the rest of its accessible¹⁷ environment, and they develop motor patterns in interaction with it (crawling, climbing, walking on uneven ground, grasping, opening doors, etc.), which we can call *practices*. Perception and motor activity are intertwined in this working through: The sensory impressions are coupled to practices that produce the specificity and determination in the impressions. The very close connection that exists in humans between the sensory modalities whose impressions have a topological structure (i.e. are image-like), in particular between haptic perception on the one hand (ideally represented in the hand) and visual perception on the other (eye), must also be taken into account here. The motor-effectual processing of reality (ideally represented by the hand) is regularly linked to feedback through vision: What is done is also seen (eye-hand coordination). For this and the following two layers, the following applies: Something perceived is only insofar determined *as* something as it is determined for something (cf. Cassirer 2009: 145), and it is determined for something through the aforementioned motor practices.

Regarding layer 3: In the long term, the child will discover the function of the branch as a means, in which the branch acts as an *instrument between* their own extremities (the hand) and the rest of the environment and can thus be used in an organ-expanding and organ-surpassing way. However, the branch itself is in *direct contact* with the environment, for example as an extension of the arm so that it can be used to reach something high up in the bushes, or as a bat so that it can be used to hit something, or as a crutch when walking. As a generalization, we can think here of large parts of the world of artefacts into which the character as tools and as means is built by design, from brooms to cups and pens to laser drills and electron microscopes, whose competent uses can be described as *techniques*. As soon as the child is able to act purposefully and rationally in the choice of means, acting with a branch means being able to recognize the branch in its respective pertinent characteristics and to treat it *as* a club, *as* a crutch, *as* an arm extension. (Matrix: Pragmatism – the dependence on purpose is built into the artifacts, in this respect they are already task-independent pens, brooms and cups, but are each time mentally represented *as* these in concrete pragmatic contexts depending on the respective task). It is also central that tools and tool-supported techniques *reduce* the *direct sensorimotor contact with the environment* from layer 2 by stepping between the body and the objects. For example, the representation of something written *as* something written becomes a technical one: The activity that is coupled to the sensorimotor experience is a technique in the sense of layer 3.

Regarding layer 4: In a further layer, the middle object can detach itself as an instrument from its use on the body and, as a worked, processed or artificially created,

¹⁷ On the concept of reach, see Schütz (1971).

This is an English translation of the **preprint** article Kasper/Hoffmeister (2023), *Philosophische und sprachtheoretische Herausforderungen an den Begriff der mentalen sprachlichen Repräsentation*. Translation was assisted by DeepL.

simple or composite object, perform a function *on its own* that completely replaces an organic function and makes the organism's contact with the environment an *indirect* one: Branches become sticks and sticks are made into a tepee, rocks become stones and stones are used to build a house. They provide the protection that the unclothed and unfelt human body does not. This layer leads from walls to wells, sundials, pumps, water gauges and steam engines to shelves, washing machines, digital clocks, calendars, sensors and measuring devices, nuclear power plants and satellites, which only need to be set in motion and then fulfill their function largely autonomously. This layer replaces direct sensorimotor interaction with the environment to an even greater extent. If you "let" the radio-controlled clock with its built-in barometer "do" its work, not only do you no longer need to take anything into your hands, you also no longer need to monitor natural cycles yourself. A complete artificial world comes between the organism and its unprocessed environment. Huge amounts of mental representations are technically mediated in this way: For example, the mental representation of a year draws on the diagrammatic form of a material representation of a year by means of a calendar according to layer 4. Drawing a diagram is a technique and reading a calendar as a finished artifact is a *technical practice* (cf. Krämer 2016 on diagrams). In relation to the experience layers "below" the year depicted on the (Gregorian) calendar, however, lies the solar year, whose mental representation is no longer available to many people because they no longer know practices (observing the course of the sun through the year) and techniques (technically representing this course of the sun) below layer 4 in order to identify it: Thus, the mental representability of something differs inter-individually depending on someone's degree of experience coverage with respect to levels 1-4.

To summarize up to this point: On the basis of the enabling layer 1 (matrix: formation: inherited) and in layers 2-4 (acquired), humans make experiences with their sensory modalities as part of the integrated cycle of action: visual, haptic-tactile, auditory, olfactory, gustatory, proprioceptive and visceroreceptive. The impressions of each sensory modality initially have their own "format" (matrix: format: modal) before the organism has a concept of objecthood. The knowledge that something that is smelled, touched and seen manifests itself in one and the same object must first be acquired. And in order for a smell, a haptic experience, a visual experience of something to be mentally (re-)presented in the service of action even in its absence, such an experience must be individuated, or discretized (matrix: differentiability): It must be possible to detach it from the constant flow of impressions in the same sensory modality. According to the symbol-philosophical thesis, this is only possible if these experiences are linked to something stable, individuable, external of greater pregnance, which can then function as a point of access for the repeated mental (re-)presentation of the content of an experience. In a (still) speechless organism, this stable, individuable, external are motor schemata,¹⁸ i.e.

¹⁸ For the basic idea, see Langer (1988 in relation to dancing and drumming), Schwemmer (1997a, chapter 2). Technical-philosophical differentiation is ours; without it, gradations of depth of understanding remain incomprehensible. The idea that body movement is central to the fixation of mental content is old, also in

This is an English translation of the **preprint** article Kasper/Hoffmeister (2023), *Philosophische und sprachtheoretische Herausforderungen an den Begriff der mentalen sprachlichen Repräsentation*. Translation was assisted by DeepL.

embodied (layer 1) practices (layer 2), techniques (layer 3) and technical practices (layer 4), which are regularly coupled with sensory impressions of a certain kind, so that the (re-)presentation of an experience of something *as* something specific is linked to the motor schemata. (Sensory representations can also occur involuntarily, for example in dreams (with little individuality: differentiability) or in the context of behavioural patterns).

However, motor activities themselves (in the non-linguistic or pre-linguistic organism) have a low degree of individuation – when measured against the symbolic form of language –, as they are usually also in a state of flux and are continuous. However, they can individuate each other mutually to a certain extent through coupled pregnancy formation (matrix: differentiability): For example, the tasting of something and the motor activities of drinking begin and end at approximately the same time, whereby that which is drunk gains relative gustatory and motor pregnancy. In short: The sensory organs' impressions of something are only individuated and the experience of this something *as* something can only be (re-)presented to the extent that the impressions of this something are saturated with practices, techniques and technical practices executed *on* that something, so that it is transformed into something specific (matrix: differentiability, order).

In humans, there are special capabilities that operate on top of layers 1–4 and that ensure that objectivity emerges from the isolated contributions of the different modes of experience, each with their own experience formats, i.e. the ensure that these isolated contributions are bound together as contributions to a specific thing (objectivity). These performances are also layered, as shown in Table 2 and explained below.

Elevation layer		Elevated capacities (partially conserved, partially invalidated)
5	transmodal and -medial (higher-level) vision	The performances of layers 1–4 converge in the eye.
6	transmodal and -medial (higher-level) imagination	In the imagination, the performances of layers 1–5 converge.
7	the linguistic sedimentation and crystallization of 1–6.	In the lexicon, the outputs of layers 1-6 converge.
8	Ordering schemata for 7 in the service of the simulation instruction	The grammar moderates the products of 7, and thus those of 1–6.

Table 2: Layers in which representations are brought together

relation to collectives, cf. Noiré's (1877) sympractical theory of language development and Bücher's (1896) "Work and Rhythm".

This is an English translation of the **preprint** article Kasper/Hoffmeister (2023), *Philosophische und sprachtheoretische Herausforderungen an den Begriff der mentalen sprachlichen Repräsentation*. Translation was assisted by DeepL.

Regarding layer 5: This addresses the particularly strong connection between different sensory modalities in humans. The sensorimotor perceptual/motor-effectual cycle in layers 2–4 include eye-hand coordination in the sense that, for example, grasping movements also create a visual impression in addition to the haptic impression when there is a visual focus on what is grasped (see above: what is done is usually also seen). The *transmodality and transmediality of vision* now emphasizes the fact that these regular couplings and feedback sensations between hand and eye lead over time to the toddler *seeing* the practical functions of things that they have once worked through haptically and motorically with accompanying vision, without having to deal with them again motorically (cf. Gehlen 1995). They *see* the corresponding practice in the something that is a door handle and this practice co-presents how the handle feels, what noises it makes, etc. The child now *sees* the corresponding technique (arm extension, bat, crutch and spear) and which sensory properties are involved. Similarly, they *see* the corresponding technical practice in the MP3 player (pressing the button leads to playback). In this way, *human vision, as higher-level vision saturated by practices, techniques and technical practices, brings together the initially isolated forms of impression of the sensory modalities* – provided that the motor schemata for the experiences of the underlying layers (see Table 1) have been passed through! At the same time, contact with the intended object is reduced even further than in the previous layers; it is limited to perception through remote senses.

Regarding layer 6: This achievement of seeing the practical properties of things now merges with the achievement of no longer even having to see things (at a higher level), but rather to *imagine* them in a way that is narrowed down to practical aspects, i.e. to their pertinent aspects.¹⁹ The child does not have to see any of these things in order to recognize the door handle as a door handle, the branch as an arm extension, crutch, racket, etc., the device as an MP3 player, but in the absence of each of these things, it can mentally represent them as objects reduced to their pertinent aspects (Matrix: Format: modality; pragmaticity: purpose-dependent and purpose-independent, see above). This stage also represents a further reduction of environmental contact: An imagined crutch no longer needs to be perceptible at all, not even through a remote sense. However, the possibility of such a conception is dependent on passing through all previous layers of experience, including higher-level seeing.

Regarding layer 7: A person's "mental lexicon", i.e. the autosemantic expressions they have mastered, can now be understood as the sedimentation and crystallization of everything that has been passed through in layers 1–6. In a word such as *crutch*, the characteristics of the object that have been reduced to pertinent aspects and thus the practices, techniques and technical practices that can be carried out with and on it, i.e. all sensory, motor, emotional, affective, cognitive, practical and poietic experiences, are sedimented and crystallized in a constant, conventional, highly pregnant and thus

¹⁹ This performance level is impressively illustrated by the finding that children's abilities in tasks involving the *mental* rotation of three-dimensional objects increase with the training they have received in the *manual* rotation of these objects (cf. Wiedenbauer & Jansen-Osmann 2008).

This is an English translation of the **preprint** article Kasper/Hoffmeister (2023), *Philosophische und sprachtheoretische Herausforderungen an den Begriff der mentalen sprachlichen Repräsentation*. Translation was assisted by DeepL.

individuated (to the point of being discrete) and repeatable form – insofar as the experiences have been made. The words themselves are at the same time motor schemata with which these representations are coupled: vocal, graphic-technical or sign language-manual. The symbolic-arbitrary version (here now in Peirce's sense) gives the representations of experience a particular pregnancy and individuality (matrix: differentiality: discrete) and thus the highest possible (re-)presentability. This is achieved through the structural character of linguistic forms. Linguistic forms, precisely because they are arbitrary symbols, form a structure of cross-references in which the form of one is also negatively restricted by the form of the other (matrix: order: systematic). This results in the highly individualized and discrete nature of the representations of experience that are linked to these forms, even if only in concrete co-contexts and contexts in the integrated cycle of action. The other, preceding formats of experience representation – practices, techniques, technical practices – do not have the same high pregnancy (discreteness, systematicity) and we consider it likely that the performance characteristics of layers 5 (higher-level vision) and 6 (transmodal imagination) are not independent of the presence of layers 7 and 8 in humans.^{20,21}

Regarding layer 8: The synsemantic expressions and parts of speech of a language as well as the sedimented and conventionalized combinatory patterns for auto- and synsemantic expressions allow two things: Firstly, they make it possible to communicate the characteristics of objects, properties and facts in complex combinations *in a coherent way* – the individual representations, each reduced to its pragmatically pertinent aspects, must fit together. On the other hand, they ensure that the components of experience captured in the individual autosemantic expressions are understood *in the right way*, so that there are no misunderstandings: What is related to what? Does Hannah in *Hannah does a somersault* do a somersault or does a somersault do Hannah? In this sense, the grammar (case, congruence, sequence) organizes the instructions for the simulated experience (for details see Kasper 2015, 2020, 2021).

To clarify once again what it means to understand utterances in relation to mental linguistic representations (or non-representing “representations”, see above, section 4.1): According to (1), an utterance is intended to guide simulated experience in the sense of a re-enactment. It is an auditory and/or visual impression, the individuation of which is achieved through the simulated re-enactment of the motor schema that produces this utterance, and the re-enactment of the experience layers 7 to 1 in their respective sensorimotor formats are coupled to it (as the form side) – insofar as and to the extent that the corresponding motor schemata have been acquired! This means that these

²⁰ Ernst Cassirer (2009) also reckons that the use of tools (layer 3) contributes to the formation of the object concept, because the instrument is individuated through its role in the action, as an intermediary between the organism and the environment and in combination with visual feedback.

²¹ Because writing is the visible, constant and thus inspectable result of a technique (writing) or even a technical practice (printing), it possesses the highest degree of discreteness. For reasons such as this, researchers such as Jack Goody and Walter Ong consider writing to be the cultural-historical condition for the formation of logical calculations and corresponding logical thought processes (cf. Ong 2006, Morais & Kolinsky 2021).

experiences are comprehensible to the extent that they are covered “downwards” the experience layers in terms of their depth by experiences made in each layer, and they are comprehensible in terms of their breadth to the extent that they have been passed through in each layer with different senses and also motorically: Is the thing that is instructed to be performed merely known in one or more sensory modalities or is it also skillfully mastered motorically (matrix: epistemicity)? How deeply or how broadly something is actually understood, i.e. to what actual depth and breadth of content it is mentally (re-) presented (or skillfully performed without representation) in a practical situation, depends not only on practical, technical and technical-practical experience with the content of the utterance but also on pragmatic motives of the communication situation (“good enough comprehension”, cf. Ferreira, Bailey & Ferraro 2002; Ferreira & Patson 2007) and cannot be determined in an absolute way. That and how utterances appeal to our re-enactment resources can be briefly indicated by the following examples.

(2) *Hannah does a somersault.*

(3) *Ole is offended.*

(4) *Easter is in three weeks.*

(5) *Chop onions and sauté until translucent.*

(6) *a square plus b square equals c square*

We can recognize the typographical utterances in (2) to (6) in their form *as* these utterances by means of higher-level seeing (layer 5). We can do this because we have layers of experience in which we have learned the technical practice of reading (loudly) from similar phenomena (layer 4). The grammatical and lexical parts of the utterance (layers 8 and 7) instruct us to simulate the experience of the stated events, i.e. to re-enact them in the modes of experience and the motor schemata coupled to them on the lower layers. And here is indeed plenty of room for inter-individually, inter-collectively, intersituationally etc. different cognitive styles (matrix: possessivity).

In (2) *Hannah does a somersault*, someone could re-enact the experience, depending on the depth of experience,...

- as a visual re-enactment of a somersault via cross-modal imagination if the person has never performed a somersault or similar physical practices themselves, but has certainly observed them in others. Something that comes as close as possible to a somersault, but is not a somersault, can also be re-enacted motorically;
- visually, haptically, proprioceptively, auditorily and practically via cross-modal imagination if the experience is one that the person has already performed themselves;
- etc.

In (3) *Ole is offended* someone...

- who has difficulties recognizing emotional-affective states in others visually, could re-enact a practice that produces the state of being offended in somebody else or in themselves;

This is an English translation of the **preprint** article Kasper/Hoffmeister (2023), *Philosophische und sprachtheoretische Herausforderungen an den Begriff der mentalen sprachlichen Repräsentation*. Translation was assisted by DeepL.

- could re-enact the state of being offended emotionally-affectively;
- etc.

In (4) *Easter is three weeks away*, someone...

- who does not have a technical-practical command of the calendar – which is a diagram according to experience layer 4 (weeks, Easter) – could again only re-enact something very general on the basis of reference structures of the grammatical form (function of predicative constructions);
- who has masters the technical practice of the (Gregorian) calendar, but not the chronological logic of locating Easter, may mentally re-enact a diagram usage practice according to which three weeks lie between the time of speaking and Easter in the representational logic of the calendar diagram.
- who has mastered the technical practice of the (Gregorian) calendar and that of the lunisolar calendar to locate Easter, may re-enact a complex diagram usage practice in which both diagram logics are related to each other;
- who has mastered all of the the above and additionally techniques to relate calendar diagrams to the natural cycles of the solar year and the lunar year, may re-enact the utterance as a relationship between solar and lunar movement.

In (5) *Chop onions and sauté until translucent*, it also plays a role for the simulated experience in the sense of a re-enactment, by which experiences this is covered: by having seen and smelled the chopping and frying or additionally by mastering the technical (chopping) and technical-practical (frying) motor schemata or even by practices and techniques and technical practices that went into the construction of the chopping tool, the stove and the pan.

Example (6), finally, *a square plus b square equals c square*, concerns the hitherto neglected artificial-symbolic comprehension. It is the verbalization of a mathematical equation and thus the linguistic-symbolic expression of a mathematical-symbolic expression, which in turn refers to a geometric technical practice. Here, too, a re-enactment may amount to little more than that of the grammatical form. Then not much is known, except that two things taken together are just as much as a third. Or it amounts to a translation – a technique – of the linguistic expression into the mathematical expression $a^2 + b^2 = c^2$. There is a reference connection with Pythagoras' theorem, then, but pursuing this reference mentally does not lead deep into the layers of experience either. For this to happen, the mathematical symbolic expression must again be treated as an instruction, the execution of which requires a geometrical technique (and insight into its functioning). Doing so makes the content of the utterance real, i.e. it actually constructs the square of the hypotenuse from the sums of the catheti squares by the technical-practical simulated re-enactment (cf. Krämer 2016).

Deep understanding is cognitively more expensive and is not necessary for many communicative and practical purposes. However, depth and breadth of understanding do not only concern the experiences coupled with linguistic expressions, but also the form of the linguistic expressions themselves: Is the vocal form of the expression *offended* known only as an auditory experience or is it also articulatory-motorically mastered? As already

This is an English translation of the **preprint** article Kasper/Hoffmeister (2023), *Philosophische und sprachtheoretische Herausforderungen an den Begriff der mentalen sprachlichen Repräsentation*. Translation was assisted by DeepL.

mentioned, the inherent logic of the symbolic form also has an effect on the pregnancy of what is mentally represented. The less pregnant the form with which the experience is coupled, the less structured the the larger pattern in which it stands, the less individuated the represented experience. Thus, the representations of “one and the same” thing differ intersituatively depending on their symbolic format, on the breadth and depth of their experiential coverage and on pragmatic motives. This is the most important reason for not simply assuming a fixed “stock” [*Bestand*]²² of “stored” representations with regard to linguistic meanings, as is assumed in a mental lexicon, for example. The theoretical-linguistic question of the meaning of expressions is itself “merely” one practical context among all others. In each of them, the meaning of expressions must be constructed anew depending on the factors mentioned and cannot simply be extended to any practical context as a meaning independent of practice. Contexts independent of practice do not exist (matrix: ontology).

5 Concluding remarks

It goes without saying that the preceding remarks can only be of a very general nature. The question of mental representations, especially linguistic ones, is complex and extensive. In our view, efforts to find answers require not only empirical results from various disciplines (e.g. interactional, usage-based linguistics, psycho- and neurolinguistics, structural linguistics, to name just the linguistic ones, cf. also Croft 1998) and various methodological approaches (e.g. ethnographic, action-theoretical descriptions, behavioral studies, structural modeling). It also requires the *prior* settlement of questions of the philosophy of science. These would concern the purposes of modeling and on the conditions of validity for statements of the scientific results against the background of the methodological paradigms chosen. Of course, we cannot do either here. Rather, with these references we would like to point to unresolved problems that extend to the question of the validity of different concepts of explanation (and understanding) in different scientific traditions. The keywords here are approaches to explanation and understanding in the (natural) sciences and the humanities. With regard to the various disciplines and methodological approaches, we refer to the studies in this volume; with regard to questions of philosophy of science, we refer to the constructive, methodological-pragmatic theory of science of Janich (2014). Based on a methodological-pragmatic approach, this framework critically examines scientific claims of validity as to whether and how these claims about observations, measurements and modelings of human performance (keyword “free will”)²³ are compatible with the skills and knowledge that have already been performatively claimed by the same researchers in doing science in the first place. In other words, it draws attention to unnoticed presuppositions (e.g. reductions, homogenizations, idealizations, conceptual equivocations) that flow into empirical research (Janich: are “invested” in it). These presuppositions may find their way into the descriptions and interpretations of research results and, in the worst case, their effects may then be projected into the object of investigation instead of being recognized

²² We owe this expression to Maïke Park.

²³ Cf. Janich (2006).

This is an English translation of the **preprint** article Kasper/Hoffmeister (2023), *Philosophische und sprachtheoretische Herausforderungen an den Begriff der mentalen sprachlichen Repräsentation*. Translation was assisted by DeepL.

as unnoticed presuppositions: They would then have been invested in the investigation from the beginning (keyword "mereological fallacy").

6 References

- Bennett, Maxwell R./Hacker, Peter M. S. ([2003] 2015): Die philosophischen Grundlagen der Neurowissenschaften. Darmstadt: Wissenschaftliche Buchgesellschaft.
- Bennett, Maxwell [R.]/Hacker, Peter [M. S.] ([2007] 2021): Die begrifflichen Voraussetzungen der kognitiven Neurowissenschaft. In: Bennett, Maxwell [R.]/Dennett, Daniel/Hacker, Peter [M. S.]/Searle, John (2010): Neurowissenschaft und Philosophie. Gehirn, Geist und Sprache. Frankfurt: Suhrkamp, 179–234.
- Bücher, Karl (1896): Arbeit und Rhythmus. Leipzig: S. Hirzel.
- Cassirer, Ernst (1996): The philosophy of symbolic forms. Volume 4: The metaphysics of symbolic forms. Edited by John Michael Krois and Donald Phillip Verene. Translated by John Michael Krois. New Haven/London: Yale University Press.
- Cassirer, Ernst (2009): Form und Technik. In: Ders.: Schriften zur Philosophie der symbolischen Formen. Herausgegeben von Marion Lauschke. Hamburg: Meiner, 123–167.
- Cassirer, Ernst ([1923, 1925, 1929] 2010): Philosophie der symbolischen Formen. Drei Bände. Erster Teil: Die Sprache. Text und Anmerkungen bearbeitet von Claus Rosenkranz. Zweiter Teil: Das mythische Denken. Text und Anmerkungen bearbeitet von Claus Rosenkranz. Dritter Teil: Phänomenologie der Erkenntnis. Text und Anmerkungen bearbeitet von Julia Clemens. Hamburg: Meiner.
- Chomsky, Noam (1973): Sprache und Geist. Frankfurt: Suhrkamp.
- Croft, William (1998): Linguistic evidence and mental representations. *Cognitive Linguistics* 9 (2), 151–173.
- Demmerling, Christoph/Schröder, Dirk (2021): Introduction. Concepts in thought, action, and emotion. In: Demmerling, Christoph/Schröder, Dirk (Eds.): Concepts in thought, action, and emotion. New essays. New York/London: Routledge.
- Ferreira, Fernanda/Bailey, Karl G. D./Ferraro, Vittoria (2002): Good-enough representations in language comprehension. *Current Directions in Psychological Science* 11(1), 11–15.
- Ferreira, Fernanda/Patson, Nikole D. (2007): The 'good enough' approach to language comprehension. *Language and Linguistics Compass* 1(1–2), 71–83.
- Frege, Gottlob (1879): Begriffsschrift. Eine der arithmetischen nachgebildete Formelsprache des reinen Denkens. Halle: Verlag von Louis Nebert.
- Gehlen, Arnold ([1940] 1997): Der Mensch. Seine Natur und seine Stellung in der Welt. 13. Auflage [dieser Ausgabe]. Wiesbaden: Quelle und Mayer.
- Graham, George (2023): Behaviorism. In: Zalta, Edward N./Nodelman, Uri (o. J.): The Stanford Encyclopedia of Philosophy. Stanford: The Metaphysics Research Lab, Philosophy Department, Stanford University. URL: <https://plato.stanford.edu/archives/spr2023/entries/behaviorism/>

This is an English translation of the **preprint** article Kasper/Hoffmeister (2023), *Philosophische und sprachtheoretische Herausforderungen an den Begriff der mentalen sprachlichen Repräsentation*. Translation was assisted by DeepL.

- Gutmann, Mathias (2005): Biologie und Lebenswelt. In: Krohs, Ulrich/Töpfer, Georg (Hrsg.): Philosophie der Biologie. Eine Einführung. Frankfurt: Suhrkamp, 400–417.
- Hartmann, Dirk (1993): Naturwissenschaftliche Theorien. Wissenschaftstheoretische Grundlagen am Beispiel der Psychologie. Mannheim u.a.: B. I. Wissenschaftsverlag.
- Hartmann, Dirk (1996): Kulturalistische Handlungstheorie. In: Hartmann, Dirk/Janich, Peter (Hrsg.): Methodischer Kulturalismus. Zwischen Naturalismus und Postmoderne. Frankfurt: Suhrkamp, 70–114.
- Hartmann, Dirk (1998): Philosophische Grundlagen der Psychologie. Darmstadt: Wissenschaftliche Buchgesellschaft.
- Hartmann, Dirk/Janich, Peter (1996): Methodischer Kulturalismus. In: Hartmann, Dirk/Janich, Peter (Hrsg.): Methodischer Kulturalismus. Zwischen Naturalismus und Postmoderne. Frankfurt: Suhrkamp, 9–69.
- Heidegger, Martin ([1927] 1967): Sein und Zeit. 11., unveränderte Auflage. Tübingen: Niemeyer.
- Hoffmeister, Toke (2021): Sprachwelten und Sprachwissen. Theorie und Praxis einer kognitiven Laienlinguistik. Berlin/Boston: Walter de Gruyter.
- Janich, Peter (2009): Kein neues Menschenbild. Zur Sprache der Hirnforschung. Frankfurt: Suhrkamp.
- Janich, Peter (2010): Der Mensch und andere Tiere. Das zweideutige Erbe Darwins. Frankfurt: Suhrkamp.
- Janich, Peter (2014): Sprache und Methode. Eine Einführung in philosophische Reflexion. Tübingen: Francke.
- Kasper, Simon (2015): Instruction Grammar. From perception via grammar to action. Berlin/Boston: Walter de Gruyter.
- Kasper, Simon (2020): Der Mensch und seine Grammatik. Eine historische Korpusstudie in anthropologischer Absicht. Tübingen: Narr.
- Kasper, Simon (2021): *Animal symbolis interveniens*. Ein Versuch zur Anknüpfung an die philosophisch-anthropologische Sprachtheorie Arnold Gehlens. Internationales Jahrbuch für philosophische Anthropologie 11(1), 43–71. DOI: <https://doi.org/10.1515/jbpa-2021-0004>
- Kasper, Simon/Purschke, Christoph (2021): Kennen, Können, Wissen. Zur Konstruktion von Expertise. In: Hoffmeister, Toke/Hundt, Markus/Naths, Saskia (Hrsg.): Laien, Wissen, Sprache. Konzepte, Anwendungsfelder und Perspektiven der Folk Linguistics im deutschsprachigen Raum. Berlin: De Gruyter, 125–156. DOI: <https://doi.org/10.1515/9783110731958-006>
- Kasper, Simon/Purschke, Christoph (2023): Whatever happened to the Scene Encoding Hypothesis? Salience and pertinence as the missing links between the Usage-based Model and Scene Encoding. *Constructions* 15(1), 1–22. DOI: <https://doi.org/10.24338/cons-610>
- Krämer, Sybille (2016): Figuration, Anschauung, Erkenntnis. Grundlinien einer Diagrammatologie. Frankfurt: Suhrkamp.

This is an English translation of the **preprint** article Kasper/Hoffmeister (2023), *Philosophische und sprachtheoretische Herausforderungen an den Begriff der mentalen sprachlichen Repräsentation*. Translation was assisted by DeepL.

- Langer, Susanne K. (1988): *Mind. An essay on human feeling*. Abridged edition. Abridged by Gary Van Den Heuvel. Baltimore/London: Johns Hopkins University Press.
- Levin, Janet (2023): Functionalism. In: Zalta, Edward N./Nodelman, Uri (o. J.): *The Stanford Encyclopedia of Philosophy*. Stanford: The Metaphysics Research Lab, Philosophy Department, Stanford University. URL: <https://plato.stanford.edu/archives/sum2023/entries/functionalism/>
- Morais, José/Kolinsky, Régine (2021): Seeing thought: a cultural cognitive tool. *Journal of Cultural Cognitive Science* 5, 181–228. DOI: <https://doi.org/10.1007/s41809-020-00059-0>
- Müller, Stefan (2022): *Grammatical theory. From transformational grammar to constraint-based approaches*. 5th, revised edition. Berlin: Language Science Press.
- Noiré, Ludwig (1877): *Der Ursprung der Sprache*. Mainz: Victor von Zabern.
- Ong, Walter J. ([1982] 2006): *Orality and literacy. The technologizing of the word*. London/New York: Routledge.
- Pitt, David (2020): Mental representation. In: Zalta, Edward N./Nodelman, Uri (o. J.): *The Stanford Encyclopedia of Philosophy*. Stanford: The Metaphysics Research Lab, Philosophy Department, Stanford University. URL: <https://plato.stanford.edu/entries/mental-representation/>
- Plessner, Helmuth ([1928] 1975): *Die Stufen des Organischen und der Mensch. Einleitung in die philosophische Anthropologie*. 3., unveränderte Auflage. Berlin/New York: Walter de Gruyter.
- Plessner, Helmuth (2017): *Conditio humana. Gesammelte Schriften VIII*. 3. Auflage. Frankfurt: Suhrkamp.
- Purschke, Christoph (2011): *Regionalsprache und Hörerurteil. Grundzüge einer perzeptiven Variationslinguistik*. Stuttgart: Steiner.
- Purschke, Christoph (2014): I remember like it was interesting. *Zur Theorie von Salienz und Pertinenz. Linguistik online*, 66(4/14), 31–50.
- Ramsey, William (2022): Eliminative Materialism. In: Zalta, Edward N./Nodelman, Uri (o. J.): *The Stanford Encyclopedia of Philosophy*. Stanford: The Metaphysics Research Lab, Philosophy Department, Stanford University. URL: <https://plato.stanford.edu/archives/spr2022/entries/materialism-eliminative/>
- Robinson, William (2023): Epiphenomenalism. In: Zalta, Edward N./Nodelman, Uri (o. J.): *The Stanford Encyclopedia of Philosophy*. Stanford: The Metaphysics Research Lab, Philosophy Department, Stanford University. URL: <https://plato.stanford.edu/archives/sum2023/entries/epiphenomenalism/>
- Schlicht, Tobias/Smortchkova, Joulia (2018): *Mentale Repräsentationen. Grundlagentexte*. Frankfurt: Suhrkamp.
- Schütz, Alfred (1971): Symbol, Wirklichkeit und Gesellschaft. In: Ders.: *Gesammelte Aufsätze. Band 1: Das Problem der sozialen Wirklichkeit*. Den Haag: Martinus Nijhoff, 331–411.
- Schütz, Alfred/Luckmann, Thomas (2017): *Strukturen der Lebenswelt*. 2., überarbeitete Auflage. Konstanz: UVK Verlagsgesellschaft/München: UVK/Lucius.

This is an English translation of the **preprint** article Kasper/Hoffmeister (2023), *Philosophische und sprachtheoretische Herausforderungen an den Begriff der mentalen sprachlichen Repräsentation*. Translation was assisted by DeepL.

- Schwemmer, Oswald (1997a): Die kulturelle Existenz des Menschen. Berlin: Akademie Verlag.
- Schwemmer, Oswald (1997b): Ernst Cassirer. Ein Philosoph der europäischen Moderne. Berlin: Akademie Verlag.
- Smart, J. J. C. (2022): The Mind/Brain Identity Theory. In: Zalta, Edward N./Nodelman, Uri (o. J.): The Stanford Encyclopedia of Philosophy. Stanford: The Metaphysics Research Lab, Philosophy Department, Stanford University. URL: <https://plato.stanford.edu/archives/win2022/entries/mind-identity/>
- Stoljar, Daniel (2024): Physicalism. In: Zalta, Edward N./Nodelman, Uri (Eds.): The Stanford Encyclopedia of Philosophy. Stanford: The Metaphysics Research Lab, Philosophy Department, Stanford University. URL: <https://plato.stanford.edu/archives/spr2024/entries/physicalism/>.
- Sturma, Dieter (Hrsg.) (2006): Philosophie und Neurowissenschaften. Frankfurt: Suhrkamp.
- ten Hacken, Pius (2009): Chomskyan linguistics and its competitors. London/Oakville: Equinox.
- Uexküll, Jakob von ([1928] 1973): Theoretische Biologie. Frankfurt: Suhrkamp.
- Werbik, Hans/Benetka, Gerhard (2016): Kritik der Neuropsychologie. Eine Streitschrift. Gießen: Psychosozial-Verlag.
- Wiedenbauer, Gunnar/Jansen-Osmann, Petra (2008): Manual training of mental rotation in children. *Learning and Instruction* 18(1), 30–41.

7 Internetressourcen

- Zalta, Edward N./Nodelman, Uri (o. J.): The Stanford Encyclopedia of Philosophy. Stanford: The Metaphysics Research Lab, Philosophy Department, Stanford University. URL: <https://plato.stanford.edu/>