Synthese (2024) 204:10
https://doi.org/10.1007/s11229-024-04594-z

ORIGINAL RESEARCH

Compositionality, communication, and commitments

Matej Drobňák[1]

Received: 20 December 2023 / Accepted: 5 April 2024 / Published online: 26 June 2024

Abstract
In recent years, there has been increasing interest in Rich Meaning Approaches (RMA) that understand the meanings of words as rich conceptual structures, such as Pustejovsky's generative lexicon. The reason for this is based on compositionality, as rich meanings have been shown to be indispensable for explaining conflict resolution in compositional processes. However, while the benefits of postulating rich meanings to explain conflict resolution are undeniable, the overall contribution of rich meanings to sentence comprehension has not yet been discussed. This paper aims to show that inferentialism counts as a version of RMA and that, once this is recognised, it can provide a robust rationale for the role of rich meanings in sentence comprehension. The rationale is based on the idea that rich meanings are indispensable for pragmatic purposes as they play a role in facilitating communication. As I argue, rich meanings not only assist in composing the semantic (truth-conditional) content of complete sentences, but also provide crucial information for determining the discursive commitments and entitlements established by utterances. Consequently, examining the implications of inferentialism for compositional processes a) offers new insights into their function and outputs and b) presents an alternative to the representationalist perspective on sentence comprehension.

Keywords Inferentialism · Rich meaning approach · Compositionality · Commitments · Sentence comprehension

1 Introduction

In several papers, Agustín Vicente and his colleagues (Vicente, 2010, 2012, 2015, 2017, 2018; Vicente & Martínez Manrique, 2016) and Hogeweg (2012, 2019) argue that the Rich Meaning Approach (RMA) is the most viable metasemantic approach to meaning. According to Vicente, an account of meaning is considered a version of

✉ Matej Drobňák
matej.drobnak@gmail.com

[1] Department of Philosophy and Social Sciences, Philosophical Faculty, University of Hradec Králové, Hradec Králové, Czechia

RMA if it accepts that "the standing meaning of a word is taken to be a rich conceptual structure that typically exceeds what is being expressed when we use the word in a context" (Vicente, 2018, p. 950). Following this definition, Pustejovsky's (1995) generative lexicon and Jackendoff's (1990) conceptual semantics are among the most prominent examples of RMA. However, as defined by Vicente, RMA encompasses a wide variety of views in linguistics, formal semantics, computational linguistics, and philosophy of language. What all these diverse views have in common is the idea that the meanings of words are conceptual structures made up of further meaning components/features/aspects/dimensions, i.e. that the meanings of words are rich.

In support of this approach, Hogeweg and Vicente (2020) provide an extensive review of the literature, which collectively suggests the following rationale for RMA: the postulation of rich meanings is indispensable because they play a crucial role in resolving conflicts within the composition of meanings of compound phrases by providing access to the meaning components associated with the words being processed. As they show, the postulation of rich meanings has proved indispensable for explaining many phenomena related to compositional processes, such as polysemy resolution and logical metonymy.

While I fully agree that rich meanings play an indispensable role in conflict resolution, I also believe that RMA needs a more robust rationale because it is not clear what role rich meanings play in terms of their broader contribution to overall sentence comprehension.

In this paper, I argue for the idea that RMA can receive such a more robust rationale from inferentialism (Brandom, 1994, 2000; Peregrin, 2014). Inferentialism is a use-theory of meaning, according to which the meaning of a word, its inferential role, is represented by a set of inferential rules. For example, the meaning of *dog* can be represented by a set of inferential rules which includes, among others, (1a) and (1b).

(1) a "X is a dog." ⊢ "X barks."
b "X is a dog." ⊢ "X is a mammal."

From the local perspective of individual words, the inferential rules are intended to capture how words are used (in relation to the use of other words). From the broader perspective of whole sentences, the inferential rules associated with individual words are supposed to determine the inferential consequences of the sentence formed by the words.[1] The inferential consequences of sentences determine the (discursive) commitments and entitlements of speakers and hearers, and these commitments and entitlements then play an inevitable role in communication, as they structure and guide our verbal and non-verbal interactions in a normative way (e.g. hearers hold speakers responsible for failing to keep their promises or correct speakers when they make contradictory claims).

[1] To avoid confusion, the claim that the inferential rules related to words determine the inferential consequences of sentences pertains to the production and comprehension of sentences. From the perspectives of competent speakers producing utterances and competent hearers understanding them, sentence meaning is determined incrementally by word meanings. However, this does not imply that word meaning has explanatory primacy over sentence meaning. I agree with inferentialists that sentence meaning precedes word meaning, and accept possible implications of this primacy for our understanding of the acquisition and evolution of language.

At a more general level, this paper aspires to establish a link between RMA and inferentialism. As I show, given how inferentialism understands meaning, this view counts as a version of RMA. The specific aim of this paper is, then, to argue that recognising inferentialism as a version of RMA can lead to a more robust rationale for RMA. In particular, the main aim of the paper is to show that (and explain why) the role of rich meanings in sentence comprehension goes beyond determining the semantic (truth-conditional/representational) content of sentences. As I argue, rich meanings provide crucial information for determining the discursive commitments and entitlements established by utterances, and in this way facilitate communication. In other words, the main aim of this paper is to show that, in addition to their role in the semantic processing of sentences, rich meanings also play an indispensable pragmatic role in sentence comprehension. By acknowledging this pragmatic role of rich meanings, inferentialism provides a more robust rationale for RMA.

As I argue further, considering rich meanings from an inferentialist perspective has important consequences for our understanding of the function and outputs of compositional processes. From the inferentialist perspective, compositional processes are understood as systematic constraints on the effects of an utterance on a conversation, rather than just systematic "instructions" for deriving the (truth-conditional) meanings of complex expressions from their individual parts. In this way, inferentialism offers an alternative to the dominant representationalist views of compositionality and sentence comprehension.

In Sect. 2, I introduce RMA and explain how the role of rich meanings in compositional processes has been understood so far. In Sect. 3, I introduce inferentialism and explain why it should be considered a version of RMA. In Sect. 4, I discuss why RMA needs a more robust rationale. In Sect. 5, I discuss how inferentialism can provide such a rationale, and how it changes the perspective on the function and outputs of compositional processes.

2 Rich meaning approach

The first thing that needs to be acknowledged is that RMA is not a unified account of meaning. The label is an umbrella term for a variety of views, often developed for very different purposes, using very different terminology, and with little or no interaction with other views that fall under RMA. The individual views are known in the literature by various names, such as decompositionalism, overspecification accounts, and thick concepts. Although they have been developed more or less independently, they usually share a common motivation – to account for the explanatory insufficiencies of the views that either understand meaning as an atomic stable function to denotation (e.g. Fodor, 1990; Fodor & Lepore, 1998; Fodor & Pylyshyn, 2015) or consider it to be underspecified (e.g. Blutner, 2004; Jayez, 2001; van Deemter & Peters, 1996).

In order to overcome these insufficiencies, researchers often consider it necessary to broaden the scope of information considered to be part of the lexical meaning. Vicente (2018) notices this common strategy and proposes using the notion of rich meanings as the main factor for categorising different views under the label of RMA. If we follow

this demarcation, then RMA encompasses a wide range of views in linguistics and philosophy of language, such as: the Prague structuralist school (Jakobson, 1933; Vachek & Dušková, 1983), componential analysis (Jackson, 1996; Nida, 1975), semantics in generative grammar (Katz, 1972), conceptual semantics (Jackendoff, 1990, 2002), generative lexicon (Pustejovsky, 1995), predictive processing (Elman, 2009, 2011), semantics in optimality theory (de Hoop & de Swart, 2000; Hendriks & de Hoop, 2001), state-space semantics (Churchland, 1995), semantic pointers (Quilty-Dunn, 2021), thick concepts (Roberts, 2013), and the rich-lexicon theory of slurs (Zeman, 2022).[2]

Despite their differences, I think it is valuable to categorise the views under the common label of RMA for two reasons. First, it reveals a robust convergence in thinking about meaning among researchers who otherwise work on very different topics, even in very different fields – a convergence that can easily become a mainstream trend if it is recognised. Second, the use of the RMA label can help researchers to overcome terminological differences, leading to a productive exchange of ideas and ultimately to a better and more integrated understanding of very different phenomena related to language and communication.

Two areas in which RMA has become particularly influential are psycholinguistics and neurolinguistics. In contrast to pioneers such as componential analysis, more recent versions of RMA (e.g. Jackendoff, 1990; Pustejovsky, 1995) understand the analysis in terms of components as a way of specifying how speakers and hearers represent and process the meanings of words at the psychological level. This shift towards the psychological reality of meaning components is motivated by the huge increase in research in psycholinguistics and neurolinguistics in recent decades. Research in these fields is producing a wealth of data on the actual processing of words and whole sentences (sentence comprehension) that needs to be explained.

Although the debates are still open, it now seems clear that RMA has proved to be extremely versatile in explaining data on actual semantic processing. To demonstrate the versatility of the approach, Hogeweg and Vicente (2020) provide a comprehensive review of research focused on many different compositional processes, including coercion effects such as meaning shifts (Frisson & Frazier, 2005; Schumacher, 2013) and logical metonymy (Pustejovsky, 1995; Zarcone, 2014), non-homogenous predication (McNally, 2005), multi-dimensional modifications (Del Pinal, 2015; Hogeweg, 2012), wild contextual variations/Travis cases (Travis, 2008; Vicente, 2012, 2015), semantic (in)felicity (Goldschmidt, 2018; McNally, 2005), polysemy resolution (Klepousniotou et al., 2008; Zeevat et al., 2017), and co-predication (Ortega-Andrés & Vicente, 2019; Schumacher, 2013). Collectively, the research on these compositional processes suggests that the postulation of rich meanings is indispensable, and thus (some version of) RMA should be accepted as the main paradigm for understanding lexical meaning in linguistics and philosophy of language.

The review of research leads Hogeweg and Vicente (2020) to the following rationale for RMA: the postulation of rich meanings is indispensable because they play

[2] Depending on how much we insist that these rich structures are "conceptual", we could probably include several other views under the label of RMA, such as distributional semantics (Baroni & Lenci, 2010; Erk, 2012; Sahlgren, 2008), conceptual role semantics (Block, 1986; Boghossian, 1994), and conceptual spaces (Gärdenfors, 2000).

a crucial role in resolving conflicts within the composition of the meanings of compound phrases by providing access to the meaning components associated with the word being processed.

In what follows, I rely mainly on Pustejovsky's (1995) generative lexicon to provide examples of what RMA is and how it is supposed to work. According to Pustejovsky (1995), the meanings of words can be analysed in terms of the rigid structure of four meaning components (qualia structures): the constitutive quale (the relation of an object to its constituents), formal quale (the relation to other objects in a larger domain), telic quale (its purpose and function), and agentive quale (the factors involved in its origin/creation). Using the notation adopted from componential analysis, we can represent the meaning of *book* as consisting of four components:

book[+PAPER] [+ARTEFACT] [+READING] [+WRITING]

In this analysis, [+ PAPER] represents the constitutive quale (what books are prototypically made of), [+ ARTEFACT] the formal quale (what kind of objects books are), [+ READING] the telic quale (what books are for), and [+ WRITING] the agentive quale (how books are made).

To see how rich meanings can help us explain compositional processes, we can focus on the example of logical metonymy. The cases of logical metonymy are those in which "the meaning of a noun is shifted into an event associated with the noun" (Hogeweg & Vicente, 2020, p. 869), as in the case of *book* in (2a), which is reinterpreted as an event in (2b).

(2) a Sarah began the book
b Sarah began reading the book

The reinterpretation is triggered by the fact that *begin* requires an eventive predicate. The conflict caused by the mismatch between the verb and the following noun can be resolved by an eventive reinterpretation of the noun. The question, however, is how hearers identify the correct eventive reinterpretation, and this is where RMA becomes helpful. As Pustejovsky (1995) argues, eventive reinterpretation is best explained by postulating that hearers have access to the rich meaning of *book*, which includes the information that books are for reading, i.e. that the meaning of *book* includes the meaning component (the telic quale) [+ READING].

In this paper I put aside the question of whether or why RMA is better than its rivals at explaining compositional processes. Rather, I am interested in the internal debates within RMA. While rich meanings have been shown to be indispensable for explaining compositional processes at the level of phrases, what role rich meanings play in compositional processes in terms of their overall contribution to sentence comprehension has not been discussed yet. I believe that inferentialism can provide an original perspective on this question. However, before I can discuss it, we need to have a better understanding of what inferentialism is.

3 Inferentialism

Inferentialism (Brandom, 1994, 2000) is a neopragmatist use-theory of meaning that seeks to explain communication and meaning in specific social-normative terms. Brandom understands communication as a social practice in which hearers and speakers engage in a "scorekeeping" of who is committed and entitled to what on the basis of the utterances that are produced. For him, communication is not just a simple transfer of information. Not only do we transfer information in communication, but we also become obliged to live up to what has been communicated (explicitly or implicitly) and hold others responsible for it.

The basic idea is that an utterance of (3a) commits the speaker to agree with (or at least not to deny) many other sentences, such as (3b) and (3c), and the hearer is entitled to criticise the speaker if she fails to comply with the commitments made.

(3) a Fido is a dog
b Fido is a mammal
c Fido is an animal

The idea that such discursive commitments (i.e. commitments to agree with something that is only implicitly communicated) are established through utterances is supported by the observation that hearers automatically recognise (and often protest) when speakers fail to honour such commitments (and contradict themselves). For example, if the speaker claims (3a) but later refuses to accept that Fido is a mammal, then the hearer automatically recognises this as something the speaker should not do (a violation of her discursive commitments) and becomes entitled to correct the speaker.

The motivation behind Brandom's inferentialism was to highlight and explore this social-normative dimension of communication, and the framework has been used to explain conversational dynamics and the discursive behaviour of speakers and hearers, such as when and why hearers protest or criticise speakers, or how misunderstandings are resolved (Kaluziński, 2022; Millson, 2014; Peregrin, 2012; Prien, 2010; Scharp, 2005; Warren, 2015). In addition, more recent versions of inferentialism (Drobňák, 2022; Tison, 2022; see also Bakker et al., 2017) develop the general picture presented by Brandom further and use it to explain how utterances (and the commitments and entitlements established through them) influence the extralinguistic interactions of speakers and hearers.

3.1 Inferentialism and RMA

At this point it may not be clear what inferentialism has to do with RMA. To understand the connection, we need to understand how the management of commitments and entitlements works, i.e. how speakers and hearers identify who is committed and entitled to what. According to inferentialism, the management of commitments and entitlements relies on the identification of the inferential consequences of an utterance. By producing an utterance, the speaker commits not only to the content of the sentence that is uttered, but also to its (relevant) inferential consequences.[3] The inferential

consequences of a sentence are determined by the inferential roles of the words that make up the sentence that is uttered. The inferential roles of words are understood as sets of inferential rules and represent the meanings of words. For example, the meaning of the word *book* can be represented by the set which includes, among others, the following inferential rules

> book = {"X is a book." ⊢ "X is paper."; "X is a book." ⊢ "X is an artefact."; "X is a book." ⊢ "X is for reading."; … "X is a book." ⊢ "X is written."}

Interestingly, the inferentialist way of representing meaning can easily be transcribed into the notation of componential analysis, and the information provided by the inferential rules basically mirrors the information provided by the meaning components:

$$book[+\text{PAPER}]\,[+\text{ARTEFACT}]\,[+\text{READING}]\,[+\text{WRITING}]$$

While this may seem surprising at first glance, this mirroring between inferentialism and RMA is not a coincidence.[4] The role of inferential rules is to capture inferrability relations between words, i.e. inferential rules are supposed to capture inferential patterns that are considered valid in a given language. Peregrin (2009) makes this very clear.

> The technical aspect of inferentialism can now be seen as concentrated into the problems of characterizing the roles of expressions by means of inferential patterns (on the background of the assumption that such patterns *must* obtain, for it is only via them that expressions acquire inferential roles in the first place). (Peregrin, 2009, p. 166)

Although not often emphasised, this has also been the main aim of prominent proponents of RMA. Katz (1972) noted that the internal structure of components can explain some cases of entailment, and Jackendoff (1990) goes even further, since his understanding of meaning components suggests that his view and inferentialism are driven by exactly the same motivation.

> Each element in a lexical decomposition can be regarded as that item's access to more general-purpose rules of inference. The problem of lexical decomposition, then, is to find a vocabulary for decomposition that permits the linguistically significant generalizations of inference patterns to be captured formally. (Jackendoff, 1990, p. 39)

In this passage Jackendoff makes it very clear that what he calls elements in a lexical decomposition (i.e. meaning components) are nothing other than what inferentialists

[3] Notice that this does not mean that the speaker is committed to all the inferential consequences of a sentence. See Drobňák (2020) and Iikawa (2023) for discussion of which inferential consequences are relevant with respect to the commitments and entitlements that are established.

[4] Notice that while the inferentialist way of representing meaning can easily be transcribed into the notation of componential analysis, there are still differences between different versions of RMA and inferentialism in which information should be captured by meaning components. However, this is typical of all versions of RMA as there is no congruence on the number and structure of meaning components. Given the complexity of the topic, I leave the discussion of how to determine meaning components for another time.

call inferential rules. What matters is not what we call them or how we represent them, but how we determine which inferential patterns in a language are significant enough to establish meaning components/inferential rules.

Recognising that there is a consonance in how inferentialism and other versions of RMA understand meaning opens up the space for inferentialists to participate in debates within RMA.[5] In the remainder of the paper, I argue that the inclusion of inferentialism in the debates has important consequences because the inferentialist view of communication provides a more robust rationale for RMA.

4 Rich meanings and compositionality

To understand why RMA needs such a rationale, we need to look at it from a broader perspective. When we do this, we can notice that RMA departs significantly from the standard understanding of the role of the meanings of words in compositional processes. In the standard truth-conditional accounts of formal semantics (Tarski, 1933; Davidson, 1967; see Glanzberg, 2021 for a review), the meanings of words are understood as simple, stable functions to denotations. For example, the meaning of *lion* is understood as a function that specifies the set of all lions as the denotation of the word. From this perspective, compositional processes take the truth-conditional meanings of words as input and produce the truth-conditional meaning of a compound phrase as output. Therefore, the outputs of compositional processes at the level of phrases are understood primarily in terms of the denotational consequences of these processes. In the composition of *stone* and *lion* into *stone lion*, the focus is on how hearers identify the correct denotation of the phrase. The shift from *lion* to *stone lion* is understood as a shift from a word denoting a set of animals to a phrase denoting a set of sculptures.

The first way in which RMA departs from this tradition lies in how it understands the inputs to compositional processes. As Hogeweg and Vicente (2020) argue, the postulation of rich meanings as inputs is necessary to explain how compositional processes generate truth-conditional meanings of phrases. This observation then supports their rationale for RMA: the postulation of rich meanings is indispensable because they play a crucial role in resolving conflicts within the composition of meanings of phrases by providing access to the meaning components associated with the words being processed.

However, Hogeweg and Vicente (2020) go further and argue that RMA should also go beyond truth-conditional meanings when thinking about the outputs of compositional processes at the level of phrases.

[5] Although there is a consonance in understanding and representing meaning, there are also significant differences. While current RMAs are constructed as processing theories, describing what speakers and hearers actually do, inferentialism is constructed as a normative theory, outlining what speakers and hearers ought to do. For simplicity, I assume in this paper that speakers and hearers determine their commitments and entitlements as they ought to. Therefore, the processing and normative theories do not diverge in their predictions. However, I understand that this is a simplification and an empirically adequate theory of communication and comprehension should be able to explain when and how the divergences between the processing and normative dimensions occur. Because of the complexity of the topic, I leave this point open for future discussion.

> The issue with this kind of approach is whether it fully describes what goes on in the composition process. *Stone*-like modifiers have effects on denotations, but they also have systematic effects on several other dimensions in conceptual representations (dimensions that can then be targeted by predication). Insofar as we consider that semantics is in the business of explaining systematic compositional relationships between classes of words, it is advisable to take into account all the material that is systematically affected in composition. (Hogeweg & Vicente, 2020, p. 872)

According to them, a complete explanation of compositional processes must account for how the set of meaning components associated with an individual noun is transformed into the set of meaning components of a compound phrase. For example, it should explain how the adjective *stone* transforms the set of meaning components of *lion* to generate the set of meaning components of stonelion:

$$lion[+ORGANIC-BASED][+ANIMAL][+BORN][+MANE]$$
$$stonelion[+MINERAL-BASED][+ARTEFACT][+DECORATION]$$
$$[+MANMADE][+MANE].$$[6]

From this perspective, the compositionality of words into phrases is seen as an operation that not only takes the rich meaning of a noun as input, but also generates the rich meaning of a phrase as output (and the task for linguists is to come up with rules that capture such operations).

This shift from generating denotational consequences to generating sets of meaning components marks the second way in which RMA departs from standard truth-conditional accounts of meaning and compositionality. Note that this is a significant broadening of the role of rich meanings in compositional processes. Instead of having an auxiliary role in determining the denotations of phrases, meaning components become the centrepiece (both the vehicle and the output) of compositional processes. While the first point about the inputs of compositional processes is generally recognised and discussed within RMA (and more broadly within linguistics and philosophy of language), the discussion of the second point about the outputs of compositional processes is basically non-existent. Even Hogeweg and Vicente (2020) mention it only in passing and do not discuss what consequences it has for our understanding of compositional processes.

The question that arises is what motivates this second departure from the standard understanding of compositionality. As I argue below, it boils down to the question of what role the rich meanings of phrases are supposed to play when we move one step up to the level of sentence comprehension. In the rest of this section, I discuss the evidence that Hogeweg and Vicente (2020) mention for motivating the idea that compositional processes generate rich meanings of phrases, and also discuss why a broader rationale is needed. In Sect. 5, I show how inferentialism can provide such a rationale.

[6] The specification of meaning components of *lion* follows Del Pinal's (2015) adaptation of Pustejovsky's qualia structures. In contrast to Pustejovsky, Del Pinal adds a perceptual quale (what denoted objects prototypically look like) to the qualia structures; represented here by [+ MANE].

4.1 Evidence from predication

For Hogeweg and Vicente (2020), the idea that compositional processes generate sets of meaning components of compound phrases as output is motivated by an empirical observation. As they notice, changes in the sets of components are reflected in what can be targeted by predication. For example, *it* in B's response to A's amazement in conversation (4) does not refer to lasagne in general, but targets a specific aspect of lasagne – its taste. From the perspective of RMA, this can be explained by postulating that the specific meaning component (the telic quale) [+ EATING] is targeted by the predication.

(4) A: Look, they even have lasagne!
B: It must be disgusting

If we add *fake* before *lasagne*, [+ EATING] is no longer available as a target of predication in (5), as a consequence of how *fake* and *lasagne* combine into *fake lasagne*.

(5) A: Look, they even have fake lasagne
B: It must be disgusting!

Interestingly, although the meaning of the phrase *fake lasagne* has been generated, a specific meaning component of *fake lasagne* is targeted by predication. In particular, if B is responding to A's amazement at the extensive use of props in some TV series, then *it* in (5) targets the look of the lasagne rather than its taste.[7] This change in which meaning component is targeted by predication reflects the change in the set of the meaning components of *lasagne* after it is combined with *fake*, and thus provides empirical evidence for the idea that the compositional processes generate sets of meaning components of the compound phrases as output.

I agree with Hogeweg and Vicente (2020) that the observation that the specific meaning components of phrases can be targeted by predication justifies the idea that compositional processes generate rich meanings of phrases as outputs. However, there has been no explanation of why there are such systematic effects of compositional processes in the first place, i.e. what the rich meanings of phrases are good for. Since specifying the meaning of a phrase is only an intermediate step towards specifying the meaning of a sentence, I believe that RMA needs a further and more robust rationale for what the role of rich meanings is in the broader context of sentence comprehension.

[7] See Del Pinal (2015) for a discussion of how *fake* modifies the structure of the meaning components of (different types of) nouns.

4.2 Sentence comprehension

The importance of providing such a rationale becomes apparent when we realise that the paradigmatic views of sentence comprehension are based on the standard truth-conditional accounts of meaning.[8] The semantic, i.e. truth-conditional, content of a sentence specifies what conditions in the world must occur for the sentence to be true. In other words, the semantic content of a sentence is understood as a certain representation of the world. This feature of the view has been widely adopted by views that focus specifically on sentence comprehension (e.g. Bock, 1987; Johnson-Laird, 1983; Van Dijk & Kintsch, 1983), and the representational view of the meaning of sentences has become the paradigm for research on semantic processing and sentence comprehension. As a result, it is generally accepted that the function of compositional processes at the level of sentences is to generate the truth-conditional meaning of sentences as output.

The fact that this is so is often obscured by vague specifications of the goals of sentence comprehension, such as "inferring the producer's message" (Kuperberg & Jaeger, 2016, p. 39). Such vague specifications give the impression of openness as to how this "message" can be understood, but in truth this is an illusion of choice – every option currently available is representationalist.

The strong focus on the truth-conditional content of sentences explains the strong focus on the denotational consequences of compositional processes at the level of phrases. Knowing which sets of objects are denoted by the particular phrases contained in a sentence is crucial for evaluating the conditions under which the sentence is true/identifying which state of the world is represented by the sentence.

The problem for RMA is that this view of sentence comprehension does not support the idea that compositional processes at the level of phrases generate rich meanings as output. From the representationalist perspective, the role of rich meanings of words is clearly delimited by, and limited to, their contribution to the processing of the truth-conditional content of sentences. If the overall function of compositional processes is to generate the truth-conditional meaning of a sentence, then once the correct denotation of a phrase has been identified, the information provided by the meaning components of a phrase is of no value to the hearer. If the truth-conditional meaning is the (only) output of compositional processes at the level of whole sentences, then it is not clear what role the rich meanings of phrases are supposed to play in sentence comprehension.

5 Inferentialism and compositionality

This leads to a rather paradoxical situation. On the one hand, there is evidence from predication that compositional processes generate sets of meaning components of phrases as outputs. On the other hand, these sets of meaning components seem to be

[8] The emphasis on denotational consequences and the truth-conditional view of semantic content is probably more typical of philosophers (e.g. Lewis, 1970), who tend to dwell on foundational issues, than of linguists, who tend to be more practically oriented (but see Heim & Kratzer, 1998 for an exception). For a discussion of the motivations of such an approach see McNally (2005). For a discussion of the shortcomings of this approach see Yalcin (2014).

redundant for sentence comprehension. What, then, is the role of the rich meanings of phrases in sentence comprehension, and why do compositional processes generate them?

In what follows, I argue that inferentialism can provide an alternative account of the function and outputs of compositional processes and sentence comprehension and that this account is congruent with the observation that compositional processes generate sets of meaning components at the level of phrases. In this way, inferentialism provides a more robust rationale for RMA.

The general idea is that the role of the rich meanings of (words and) phrases in sentence comprehension is to determine the inferential consequences of the whole sentence. In other words, besides truth conditions, compositional processes at the level of a whole sentence generate a set of inferential consequences of the sentence as output. This set determines which commitments and entitlements are established by an utterance of the sentence, and thus determines the effect of the utterance on a conversation.

To show how this link between rich meanings and the sets of inferential consequences of sentences is supposed to work, let us focus on the example of the sentence (6).

(6) The lion is eating a book

From the perspective of inferentialism, the full process of comprehending (6) involves combining the rich meanings of the individual words. In particular, I will focus on the words *lion* and *book*. Upon hearing (6), the hearer has access to the rich meanings of the individual words *book* and *lion*, which include the meaning components represented by the inferential rules (7a), (7b), (7c), (7d), (7e), (7f), (7 g), and (7 h).

book [+ PAPER] [+ ARTEFACT] [+ READING] [+ WRITING].
lion [+ ORGANIC-BASED] [+ ANIMAL] [+ BORN] [+ MANE].

(7) a "X is a lion." ⊢ "X is organic."
b "X is a lion." ⊢ "X is an animal."
c "X is a lion." ⊢ "X was born."
d "X is a lion." ⊢ "X has a mane."
e "X is a book." ⊢ "X is made of paper."
f "X is a book." ⊢ "X is an artefact."
g "X is a book." ⊢ "X is for reading."
h "X is a book." ⊢ "X was written."

These meaning components are then combined in compositional processes and used to generate the set of inferential consequences of the whole sentence, which includes (8a), (8b), (8c), (8d), and (8e), among many others.

(8) a The animal is eating an artefact
b The animal is eating something for reading

c Something with a mane is eating something that was written
d An organic-based life form is eating a book
e The lion is eating something made of paper

The set that is generated represents the output of the compositional processes that take place during the processing of (6) and determines the commitments and entitlements of the speaker and the hearer. Once the hearer has generated the set of inferential consequences/commitments, she can use the information that has been generated for different purposes. For example, if (6) is uttered to a zookeeper by a visitor, (8e) can be used by the zookeeper to decide to intervene immediately because paper could cause digestive and other health problems for the lion.

From the inferentialist perspective on sentence comprehension, it makes perfect sense to say that the function of compositional processes at the level of phrases is to generate the sets of meaning components assigned to the phrases. The reason why this makes sense is that the meaning components that hearers assign to a phrase influence the consequences that can be inferred from the whole sentence. In other words, we can see compositional processes at the level of phrases as systematic constraints on the overall sets of inferential consequences of sentences. For example, if we compare (9) and (6) (when uttered, say, in the context of an art exhibition), then the effect of combining *stone* and *lion* into *stone lion* can be seen as a constraint that blocks the possibility of inferring (8a), (8b), and (8d) from (9).

(9) The stone lion is eating a book

In this way, inferentialism naturally encompasses the observation of Hogeweg and Vicente (2020). If compositional processes work in such a way that they (also) generate the sets of inferential consequences of sentences, then it makes perfect sense that compositional processes generate sets of meaning components at the level of phrases (and thus that the role of rich meanings in compositional processes goes beyond determining the truth-conditional meaning of phrases).

There is no doubt that rich meanings play an important role in the composition of the truth-conditional meaning of sentences. The question, however, is whether this should be seen as the only role that rich meanings play in sentence comprehension. By showing how the rich meanings of words determine the inferential consequences of a sentence, and how the inferential consequences determine the commitments and entitlements of an utterance, inferentialism shows that the role of rich meanings goes beyond the composition of the truth-conditional meaning of a sentence. In other words, inferentialism helps us to see that rich meanings are indispensable for our pragmatic use of utterances.

In this way, inferentialism provides a robust rationale for RMA: rich meanings are indispensable because they facilitate communication by determining the commitments and entitlements of utterances by providing access to rich information related to the words being processed.

6 Conclusions

In this paper I establish connections between RMA and inferentialism. The main aim of the paper is to argue that inferentialism can provide a robust rationale for RMA from the perspective of sentence comprehension. Hogeweg and Vicente (2020) note that compositional processes generate the rich meaning of phrases (and thus go beyond determining their truth-conditional meaning). However, there has been no explanation yet of what role the rich meanings of phrases play in overall sentence comprehension. Inferentialism emphasises that the rich meanings of words, and the way they are combined into the rich meanings of phrases, determine the sets of inferential consequences of whole sentences. From the inferentialist perspective, these sets determine the commitments and entitlements established by utterances and thus facilitate communication. By identifying the indispensable role that rich meanings play in communication, inferentialism explains why the role of rich meanings goes beyond the denotational consequences of compositional processes and what role they play in overall sentence comprehension. In this way, inferentialism provides an alternative to the representationalist paradigm of sentence comprehension and sheds new light on the function and outputs of compositional processes. Rather than simply being systematic "instructions" for determining the truth-conditions of a sentence, compositional processes can be viewed as systematic constraints on the overall sets of inferential consequences of sentences (which in turn constrain the effect of an utterance on a conversation).

Although the paper discusses the relationship between compositional processes and the "normative standings" of speakers and hearers (their commitments and entitlements), an important aspect of this relationship has not been discussed. As I show, compositional processes influence the subsequent normative standings of speakers and hearers. The question is whether the normative standings of speakers and hearers prior to a sentence being uttered can also influence the results of compositional processes, i.e. whether the relation between compositional processes and normative standings is bidirectional. The idea would be that, on the basis of what the speaker is committed to, some of the inferential consequences licensed by the rich meanings of words might be blocked early in the processing of relevant words, and so the prior normative standings would constrain the input into compositional processes. It seems natural that if compositional processes serve the pragmatic function of influencing normative standings, then they should be sensitive to the prior normative standings of speakers and hearers. Developing this idea in detail could prove helpful in explaining the pragmatic enrichment of compositional processes (Recanati, 2012). In other words, inferentialism could provide an original perspective on how various conflicts in compositional processes are resolved, such as contextually induced cases of logical metonymy (Zarcone, 2014) or the cases of wild contextual variations/Travis cases (Travis, 2008; Vicente, 2012).

The final remark concerns something that was not discussed in the paper – the benefits that inferentialism can gain from being recognised as a version of RMA. In recent decades, various versions of RMA have become extremely influential in explaining empirical data on the actual semantic processing of sentences, and there

are well-established ways of explaining data in terms of rich meanings. So far, inferentialism has mostly been developed as a theoretical doctrine. The recognition that inferentialism is a version of RMA gives inferentialists access to this extremely rich source of empirical data. It opens up the possibility of developing inferentialism as an empirically informed doctrine, and of using the methods of psycholinguistics and neurolinguistics to test the empirical plausibility of inferentialist explanations of particular phenomena. As Peregrin (2022) would put it, it opens up the possibility of building inferentialism on naturalised grounds.

Acknowledgements I would like to thank Lotte Hogeweg, Jaroslav Peregrin, Bartosz Kaluziński, and two anonymous reviewers for their feedback on an earlier version of the paper.

Funding This work was supported by The Czech Science Foundation (GAČR), grant number 22-05200O.

Declarations

Conflict of interest The author has no conflicts of interest to declare.

References

Bakker, A., Ben-Zavi, D., & Makar, K. (2017). An inferentialist perspective on the coordination of actions and reasons involved in making a statistical inference. *Mathematics Education Research Journal, 29*(4), 455–470. https://doi.org/10.1007/s13394-016-0187-x

Baroni, M., & Lenci, A. (2010). Distributional memory: A general framework for corpus-based semantics. *Computational Linguistics, 36*(4), 673–721. https://doi.org/10.1162/coli_a_00016

Block, N. (1986). Advertisement for a semantics for psychology. *Midwest Studies in Philosophy, 10*(1), 615–678. https://doi.org/10.1111/j.1475-4975.1987.tb00558.x

Blutner, R. (2004). Pragmatics and the lexicon. In L. R. Horn & G. Ward (Eds.), *Handbook of Pragmatics* (pp. 488–514). Blackwell.

Bock, K. (1987). Exploring levels of processing in sentence production. In G. Kempen (Ed.), *Natural Language Generation* (pp. 351–363). Martinus Nijhoff.

Boghossian, P. (1994). Inferential role semantics and the analytic/synthetic distinction. *Philosophical Studies, 73*(2/3), 109–122. https://doi.org/10.1007/BF01207660

Brandom, R. (1994). *Making it explicit: Reasoning, representing, and discursive commitment*. Harvard University Press.

Brandom, R. (2000). *Articulating reasons: An introduction to inferentialism*. Harvard University Press.

Churchland, P. (1995). *The engine of reason, the seat of the soul*. MIT Press.

Davidson, D. (1967). Truth and meaning. *Synthese, 17*(3), 304–323.

de Hoop, H., & de Swart, H. (2000). Temporal adjunct clauses in Optimality Theory. *Rivista di Linguistica, 12*, 107–127.

Del Pinal, G. (2015). Dual content semantics, privative adjectives, and dynamic compositionality. *Semantics and Pragmatics, 8*(7), 1–53. https://doi.org/10.3765/sp.8.7

Drobňák, M. (2020). Inferentialism on meaning, content, and context. *Acta Analytica, 35*(1), 35–50. https://doi.org/10.1007/s12136-019-00394-0

Drobňák, M. (2022). Normative inferentialism on linguistic understanding. *Mind & Language, 37*(4), 564–585. https://doi.org/10.1111/mila.12337

Elman, J. (2009). On the meaning of words and dinosaur bones: Lexical knowledge without a lexicon. *Cognitive Science, 33*(4), 547–582. https://doi.org/10.1111/j.1551-6709.2009.01023.x

Elman, J. (2011). Lexical knowledge without a lexicon? *The Mental Lexicon, 6*(1), 1–33. https://doi.org/10.1075/ml.6.1.01elm

Erk, K. (2012). Vector space models of word meaning and phrase meaning: A survey. *Language and Linguistics Compass, 6*(10), 635–653. https://doi.org/10.1002/lnco.362

Fodor, J. (1990). *A theory of content and other essays*. MIT Press.

Fodor, J., & Lepore, E. (1998). The emptiness of the lexicon: Reflections on James Pustejovsky's The Generative Lexicon. *Linguistic Inquiry, 29*(2), 269–288. https://doi.org/10.1162/002438998553743
Fodor, J., & Pylyshyn, Z. (2015). *Minds without meanings: An essay on the content of concepts*. MIT Press.
Frisson, S., & Frazier, L. (2005). Carving up word meaning: Portioning and grinding. *Journal of Memory and Language, 53*(2), 277–291. https://doi.org/10.1016/j.jml.2005.03.004
Gärdenfors, P. (2000). *Conceptual spaces: The geometry of thought*. MIT Press.
Glanzberg, M. (2021). Truth. In E. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy (Summer 2021 Edition)*. Retrieved December 20, 2023, from https://plato.stanford.edu/archives/sum2021/entries/truth/.
Goldschmidt, A. (2018). *Hitting playfully but hard: Conceptual effects of verb–adverb modification in the domain of force*. Utrecht University dissertation.
Heim, I., & Kratzer, A. (1998). *Semantics in Generative Grammar*. Blackwell.
Hendriks, P., & de Hoop, H. (2001). Optimality theoretic semantics. *Linguistics and Philosophy, 24*(1), 1–32. https://doi.org/10.1023/A:1005607111810
Hogeweg, L. (2012). Rich lexical representations and conflicting features. *International Review of Pragmatics, 4*(2), 209–231. https://doi.org/10.1163/18773109-00040205
Hogeweg, L. (2019). Suppression in interpreting adjective noun combinations and the nature of the lexicon. *Journal of Semantics, 36*(4), 721–751. https://doi.org/10.1093/jos/ffz012
Hogeweg, L., & Vicente, A. (2020). On the nature of the lexicon: The status of rich lexical meanings. *Journal of Linguistics, 56*(4), 865–891. https://doi.org/10.1017/S0022226720000316
Iikawa, H. (2023). Taming holism: An inferentialist account of communication. *Acta Analytica, 38*(4), 593–612. https://doi.org/10.1007/s12136-023-00549-0
Jackendoff, R. (1990). *Semantic structures*. MIT Press.
Jackendoff, R. (2002). *Foundations of language*. Oxford University Press.
Jackson, H. (1996). *Words and their meaning*. Addison Wesley Longman Inc.
Jakobson, R. (1933). La scuola linguistica di Praga. *La Cultura, 12*, 633–641.
Jayez, J. (2001). Underspecification, context selection, and generativity. In F. Busa, & P. Bouillon (Eds.), *The language of word meaning (Studies in natural language processing)* (pp. 124–148). Cambridge University Press. https://doi.org/10.1017/CBO9780511896316.010
Johnson-Laird, P. N. (1983). *Mental models*. Harvard University Press.
Kaluziński, B. (2022). Inferentialism, context-shifting and background assumptions. *Erkenntnis, 87*(6), 2973–2992. https://doi.org/10.1007/s10670-020-00335-z
Katz, J. (1972). *Semantic theory*. Harper and Row.
Klepousniotou, E., Titone, D., & Romero, C. (2008). Making sense of word senses: The comprehension of polysemy depends on sense overlap. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 34*(6), 1534–1443. https://doi.org/10.1037/a0013012
Kuperberg, G. R., & Jaeger, F. T. (2016). What do we mean by prediction in language comprehension? *Language, Cognition and Neuroscience, 31*(1), 32–59. https://doi.org/10.1080/23273798.2015.1102299
Lewis, D. (1970). General semantics. *Synthese, 22*(1), 18–67. https://doi.org/10.1007/BF00413598
McNally, L. (2005). Lexical representation and modification within the noun phrase. *Recherches Linguistiques de Vincennes, 34*, 191–206.
Millson, J. (2014). Queries and assertions in minimally discursive practice. In R. Kibble, P. Piwek, & G. Popova (Eds.), *Questions, discourse and dialogue: 20 years after making it explicit*, *Proceedings of AISB50* (pp. 267–278). Goldsmiths Press.
Nida, E. (1975). *Componential analysis of meaning*. Mouton.
Ortega-Andrés, M., & Vicente, A. (2019). Polysemy and co-predication. *Glossa: A Journal of General Linguistics, 4*(1), 1–23. https://doi.org/10.5334/gjgl.564
Peregrin, J. (2014). *Inferentialism: Why rules matter*. Palgrave Macmillan.
Peregrin, J. (2009). Inferentialism and the compositionality of meaning. *International Review of Pragmatics, 1*(1), 154–181. https://doi.org/10.1163/187731009X455875
Peregrin, J. (2012). The normative dimension of discourse. In K. Allan & K. M. Jasczolt (Eds.), *Cambridge Handbook of Pragmatics* (pp. 209–225). Cambridge University Press.
Peregrin, J. (2022). Inferentialism naturalized. *Philosophical Topics, 50*(1), 33–54. https://doi.org/10.5840/philtopics20225013
Prien, B. (2010). Robert Brandom on communication, reference, and objectivity. *International Journal of Philosophical Studies, 18*(3), 433–458. https://doi.org/10.1080/09672559.2010.494439
Pustejovsky, J. (1995). *The generative lexicon*. MIT Press.

Quilty-Dunn, J. (2021). Polysemy and thought: Toward a generative theory of concepts. *Mind & Language, 36*(1), 158–185. https://doi.org/10.1111/mila.12328
Recanati, F. (2012). Pragmatic enrichment. In D. Fara & G. Russell (Eds.), *Routledge Companion to Philosophy of Language* (pp. 67–78). Routledge.
Roberts, D. (2013). Thick concepts. *Philosophy Compass, 8*(8), 677–688. https://doi.org/10.1111/phc3.12055
Sahlgren, M. (2008). The distributional hypothesis. *Rivista di Linguistica, 20*(1), 33–53.
Scharp, K. (2005). Scorekeeping in a defective language game. *Pragmatics and Cognition, 13*(1), 203–226. https://doi.org/10.1075/pc.13.1.14sch
Schumacher, P. B. (2013). When combinatorial processing results in reconceptualization: Towards a new approach of compositionality. *Frontiers in Psychology, 4*(677), 1–13. https://doi.org/10.3389/fpsyg.2013.00677
Tarski, A. (1933). The concept of truth in the languages of the deductive sciences (in Polish). In *Prace Towarzystwa Naukowego Warszawskiego, Wydzial III Nauk Matematyczno-Fizycznych 34*. Warsaw.
Tison, R. (2022). The fanciest sort of intentionality: Active inference, mindshaping and linguistic content. *Philosophical Psychology*. https://doi.org/10.1080/09515089.2022.2062315
Travis, C. (2008). *Occasion-sensitivity*. Oxford University Press.
Vachek, J., & Dušková, L. (1983). *Praguiana: Some basic and less known aspects of The Prague Linguistic School*. John Benjamins.
van Deemter, K., & Peters, S. (1996). *Semantic ambiguity and underspecification*. CSLI Publications.
Van Dijk, T. A., & Kintsch, W. (1983). *Strategies of discourse comprehension*. Academic Press.
Vicente, A. (2010). Clusters: On the structure of lexical concepts. *Dialectica, 64*(1), 79–106. https://doi.org/10.1111/j.1746-8361.2010.01223.x
Vicente, A. (2012). On Travis cases. *Linguistics and Philosophy, 35*(1), 3–19. https://doi.org/10.1007/s10988-012-9109-x
Vicente, A. (2015). The green leaves and the expert: Polysemy and truth-conditional variability. *Lingua, 157*, 54–65. https://doi.org/10.1016/j.lingua.2014.04.013
Vicente, A. (2017). What words mean and express: Semantics and pragmatics of kind terms and verbs. *Journal of Pragmatics, 117*, 231–244. https://doi.org/10.1016/j.pragma.2017.07.007
Vicente, A. (2018). Polysemy and word meaning: An account of lexical meaning for different kinds of content words. *Philosophical Studies, 175*(4), 947–968. https://doi.org/10.1007/s11098-017-0900-y
Vicente, A., & Martínez Manrique, F. (2016). The big concepts paper: A defence of hybridism. *The British Journal for the Philosophy of Science, 67*(1), 59–88. https://doi.org/10.1093/bjps/axu022
Warren, J. (2015). Talking with tonkers. *Philosopher's Imprint, 15*(24), 1–24.
Yalcin, S. (2014). Semantics and metasemantics in the context of generative grammar. In A. Burgess & B. Sherman (Eds.), *Metasemantics: New essays on the foundations of meaning* (pp. 17–54). Oxford University Press.
Zarcone, A. (2014). Even*t knowledge and models of logical metonymy interpretation*. Universität Stuttgart dissertation.
Zeevat, H., Grimm, S., Hogeweg, L., Lestrade, S., & Smith, E. A. (2017). Representing the lexicon: Identifying meaning in use via overspecification. In K. Balogh & W. Petersen (Eds.), *Bridging formal and conceptual semantics: Selected papers of BRIDGE-14* (pp. 153–186). Düsseldorf University Press.
Zeman, D. (2022). A rich-lexicon theory of slurs and their uses. *Inquiry, 65*(7), 942–966. https://doi.org/10.1080/0020174X.2021.1903552