

# The semantics-pragmatic interface: propositional content and theories of processing

## *Interface semântico-pragmática: conteúdo proposicional e teorias de processamento*

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**ABSTRACT:** This paper argues that a ‘minimal semantic’ theory does not account for the levels of appeal to context needed to evaluate truth at the propositional level. Specifically, it is argued that, beyond pronominal appeals allowed for by minimalists, pragmatics can permeate propositional content in a number of ways. These include saturation, free enrichment, and strengthening and loosening of constituent concepts. The first relates to how context aids referencing of indexicals; the second to unarticulated constituents (for example, ‘he paid’ with the unarticulated constituent being ‘the bill’) and the third to how context can fix ambiguities that may arise from attributing a specific meaning to a concept (For example, metaphorical as opposed to literal). By showing that pragmatic processes operate at the propositional level, it is concluded that a view which sees semantics as being primary to determining meaning at the propositional level and pragmatic processes as secondary is erroneous. Instead, a more plausible argument is that the two processes are parallel, which has two significant implications. The first is that propositions can only be fully assessed at utterance level. The second is that advocates for a computational, modular account of how the mind is modelled may need to revise their theory, based on the parallel processing argument.

**KEYWORDS:** Propositional content; Theories of processing; Minimal semantics; Contextualism. Semantic-pragmatic interface.

**RESUMO:** Este artigo argumenta que uma teoria de semântica minimalista não considera os níveis de recurso ao contexto necessários para avaliar a verdade ao nível proposicional. Especificamente, argumenta-se que, para além de apelos pronominais permitidos pelos minimalistas, a pragmática pode permear o conteúdo proposicional de várias maneiras. Estes incluem a saturação, o enriquecimento livre, e fortalecimento e enfraquecimento dos conceitos constituintes. O primeiro refere-se a como o contexto ajuda na referência aos indexadores; a segunda aos constituintes desarticulados (por exemplo, ‘pagar’ com o constituinte desarticulado “a conta”) e o terceiro a como o contexto pode corrigir ambiguidades que possam surgir a partir de atribuir um significado específico a um conceito (por exemplo, metafórico, em oposição a literal). Ao mostrar que processos pragmáticos operam no nível proposicional, conclui-se que uma visão que vê a semântica como sendo primordial para determinar o significado ao nível proposicional e os processos pragmáticos como secundários é errônea. Em vez disso, um argumento mais plausível é que os dois processos são paralelos, o que tem implicações significativas. A primeira implicação é que as proposições só podem ser plenamente avaliadas no nível do enunciado; a segunda é que os defensores de uma teoria da mente computacional e modular podem precisar rever suas hipóteses, com base no argumento de processamento paralelo.

**PALAVRAS-CHAVE:** Conteúdo proposicional; Teorias de processamento; Semântica minimalista; Contextualismo; Interface semântico-pragmática.



## Introduction

Authors such as Carston (2002, 2008), Bach (1999), Borg (2004a) and Recanati (1994) have asked what the semantics/pragmatics distinction is and whether it really matters. The view presented in this paper will be that it does matter, especially when considering how language is processed. As a starting point to distinguish between semantics and pragmatics, Jaszczolt (2002, p. 1) states that semantics is concerned with the meaning of words and sentences ('linguistic information' for Carston, 2008), whereas speaker meaning at the level of utterances in context falls within the domain of pragmatics (based on the recruitment of 'non-linguistic information' for Carston, 2008). However, it could be argued that this distinction is not always clear and may be considered inadequate at best once applied to examples of natural language. This should be apparent when considering the seemingly simple language exchange and the meaning implied by the utterance in (1):

(1) Dave: It's gloomy out there.

(Possible meaning:

- Semantic: the atmosphere is gloomy outside of this office
- Pragmatic: the students do not look particularly upbeat.)

Jenny: It always is during exam time.

(Possible meaning:

- Semantic: the atmosphere is always like that during exam time
- Pragmatic: the students look that way as it is exam time which concerns them.)

For Borg (2004a), a formalist and key advocate of minimalism, meaning in the above exchange would be derived by identifying the words involved (phonetic interpretation) and the structural properties of the sentence

(syntactic interpretation, which would yield a logical form). These two components would allow for the meaning of the sentence to be analysed at the semantic level. That is to say, the logical form, based on the composition of the constituent elements of the sentence, would suffice for an assessment of truth, which is central to determining meaning for Borg's formalist approach (compositionality refers to how sentences are formed: they are not arbitrarily put together, rather compositionality determines the way in which they can be put together). Once meaning has been assessed at the truth-conditional level, the interlocutor may then appeal to pragmatics to ascertain what the speaker meant to convey by the utterance of the sentence in the particular context in which it was uttered, which would perhaps yield another, quite different interpretation of meaning (see example 1 for a possible semantic and pragmatic determination of meaning).

Therefore, to assess the sentence 'it's gloomy out there', the speaker would first identify and analyse the words and the structural properties of the sentence, which would yield a logical form. This would then allow for an assessment of meaning by determining truth; for example, 'it's gloomy out there' is true if 'it is gloomy out there'. A pragmatic appeal to determine meaning in the context in which the utterance was made would then follow, perhaps yielding a different interpretation of meaning.

This final point of multiple possible interpretations of meaning at the semantic (sentence) and pragmatic (utterance) level poses a number of important considerations when considering the semantic/pragmatic divide. Firstly, the formalist approach above suggests that determining meaning requires a semantic analysis prior to a pragmatic appeal, which in turn posits a processing model (namely, semantics prior to pragmatics). It also places pragmatics outside of an interpretation of meaning at the sentence level. However, it could be argued that the sentence 'it's gloomy out there' requires pragmatic appeals to context (which can include the physical context in

which the utterance was made as well as psychological considerations such as speakers' intentions), including assigning indexical reference to 'it' and deictic reference to 'out there'. These appeals would mean that a truth-evaluation at the sentence level would not be possible without an appeal to pragmatics, thereby blurring the lines between a processing model that advocates semantics before pragmatics. If it can be shown that pragmatics is necessary for interpreting meaning at the level of the sentence (where formalists assign meaning via the truth-conditional approach), then it may have a number of ramifications for how the semantic/pragmatic divide is determined and how language is processed. This is evident from the following statement by Borg (2004a, p. 26):

The heart of the truth-conditional approach is the claim that analyses of literal linguistic meaning can be delivered in terms of a specification of the conditions under which a sentence will be true, and that this specification can be delivered solely through the formal features of the linguistic items in play. In this way we can determine the meaning of a sentence independently of the uses to which that sentence is being put.

The aim of this paper is to further demonstrate how pragmatics can intrude at the level of meaning outlined by Borg's formalist approach and, therefore, argue for a contextualist account of the semantic/pragmatic divide, one that has significant insights for how language processing is viewed. This essay paper will begin by further outlining two, what may be called, extreme positions of the semantics/pragmatics divide. These will be formal semantics, with a focus on Borg's (2004a) minimalist approach, and contextualism. The argument for a contextualist understanding will then be presented by focusing on colour adjectives. The paper will finish by considering how viewing the distinction from a contextualist stance has implications for how language is processed.

## 1 Two theories of the divide

As stated above, the two theories that will be explored to outline how semantics might be distinguished from pragmatics and vice versa are often considered to be disparate in their stance. For a more formal semantic account, the position presented will mainly focus on Borg's 'semantic minimalism'. The contextualist account will reference Recanati, with occasional reference to Sperber and Wilson (1995).

### 1.1 Semantic minimalism

The formal approach claims that the focal point at which to study language should lie in the formal features of linguistic expressions (BORG, 2004a, p. 15). This essentially places the focus, as in the definition provided in the introduction, at the level of words and sentences. While this analysis of formal, linguistic features of language does not necessarily exclude language in use, it certainly places emphasis on examination being carried out prior to a consideration of meaning in use on a particular occasion and in a particular context. Rationale for this may not seem apparently clear, but Borg (2004a, p. 16) argues that "literal meaning is something that attaches to language independent of use". From a formalist perspective, a speaker would analyse a sentence by first identifying the words involved and the structural properties (syntax) before analysing the meaning of this syntactic item (semantic interpretation). This suggests that semantic analysis takes place first and that the hearer would then consider pragmatic elements, such as context, in arriving at an interpretation of meaning at utterance level.

Interestingly, this model of interpreting meaning has correlations with Grice's (1957, 1975) notion of 'what is said' and 'what is implicated': literal meaning of 'what is said' is extracted from communicated meaning of 'what

is implicated'; in other words, semantic meaning is extracted from pragmatic meaning. The description above fits into Borg's (2004a, p. 22) goal of providing a productive and systematized route to understanding language. Such a computational approach may have its appeals when considering how people are able to produce an infinite range of sentences by combining words while also achieving clarity – at least some of the time.

Terminology introduced thus far presents the study of meaning at the level of words and sentences as a semantic endeavour, and the role of context and utterance meaning within pragmatics. This again raises the question as to why distinguish between the two if one seemingly chooses to focus on meaning at the level of the sentence and the other at the level of the utterance. However, advocates of formal semantics, while explicitly stating that their focus is not meaning at utterance level, do state that their analysis of meaning at the level of the sentence does operate to ascribe and evaluate 'truth' (BORG, 2004a). This takes place at the level of proposition, which seems to be where distinguishing between semantics and pragmatics becomes perhaps more opaque, but also more overtly relevant when considering how sentences are differentiated from propositions. A sentence is an abstract grammatical unit, whereas a proposition is a description of a state of affairs (JASZCZOLT, 2002, p. 2). Of absolute importance here is that while a sentence can be a proposition, propositions are not necessarily sentences. An example of this can be seen below where the two sentences constitute the same proposition:

Sentence 1: The eagle is above the sparrow

Sentence 2: The sparrow is below the eagle

In the two sentences above, the words are different and the subject changes but they both still express the same proposition, namely that the

truth of one, as determined by the state of affairs, guarantees the truth of the other. The value to the above debate of focusing on propositions is also apparent in Goddard's (1998, p. 36) definition: "a proposition is a sentence supplemented by information about the reference of any indexical reference it contains". This definition, from what we understand, would be close to that of Borg's and considering how that reference would need to be supplemented (via pragmatics) presents an area of significant analysis for exploring the semantic/pragmatic distinction. In other words, there is an admission here that pragmatics, although only to fix indexical reference, is needed prior to an assessment of truth and, therefore, meaning, which suggests the model of processing language as semantics followed by pragmatics is not exact.

Borg terms her formal position as 'semantic minimalism'. Three central claims are of importance to this position. The first is that semantic content must be traceable to the syntactic level. The second claim states that semantic content is complete and, as the proposition is the level at which semantic analysis is concerned, propositions should, therefore, be semantically complete. The final claim is that the only context sensitive elements within the syntax of language are indexical terms, such as 'I', 'this', and 'that' (BORG, 2010). These 'minimal semantic concessions' (BORG, 2004b), which require an appeal to context, must, for Borg, be syntactically triggered. That is to say, in propositions which contain indexicals or demonstratives, the appeal to context is triggered by the syntax of the language and that these appeals would only be made to allow for the explication of the identity of the speaker and or the time and place of utterance. Other factors that Borg considers to be perspectival, such as 'the intentional features of the context of utterance', cannot and should not need to be accounted for in a formal account of semantics (BORG, 2004b, p. 217-218). A possible reason for this is that perspectival features, which include speaker intentions, are nebulous in that the psyche and intentions of a speaker are so possibly infinite as to

be unanalysable. A more focused reason for the formal semantic account is obvious from Borg's (2004b, p. 218-219) quotation below:

A moderate formal theory which makes no appeal to the intentional states of the speaker in specifying semantic content counts as a stronger form of formal theory than one that takes speaker intentions as pervasive at the semantic level ... a position to move from only should it prove impossible to maintain ... this point comes into sharp relief when we consider a potentially key motivation for adopting some kind of formal semantics, namely its compatibility with a modular model of the mind.

Essentially, if it could be shown that content at the propositional level included pragmatic features that were 'perspectival', then this may raise questions regarding minimalism and a modular account of how the mind is modelled.

To summarise, the position presented by Borg's minimal semantics might be analysed as follows when applied to the example provided in the introduction:

#### **Semantic level**

Dave: It's gloomy out there.

(Proposition: 'it is gloomy', with 'it' triggering a syntactical appeal to context and possibly being ascribed 'the weather' or 'the atmosphere' or 'the temperament of the students')

Jenny: It always is during exam time.

(Proposition: 'it is always gloomy during exam time', with the same appeal to context)

#### **Pragmatic level or level of utterance meaning**

A secondary, pragmatic assessment of meaning at utterance level that may differ significantly to a truth-conditional account.

While the above is not wholly representative, it does highlight that some advocates of formal semantics draw a clear distinction, one that

places semantics at the level of truth-conditional meaning determined by constituent elements within a sentence that forms a proposition and pragmatics at the level of meaning realised in use. However, if it can be shown that propositional content must make more than just a 'non-perspectival' appeal in order to be assessed at the truth-conditional level (the second key claim above), then the formal account may need to be rethought.

## **1.2 Contextualism**

Like Borg's minimal semantics there exist many theories within contextualism. According to DeRose (1999), "contextualism refers to the position that the truth-conditions knowledge-ascribing and knowledge-denying sentences vary in certain ways according to the context in which they are uttered". Although many other definitions may exist, this one serves the purpose of highlighting that, for the contextualist, an evaluation of truth or falsity in respect to propositions is something that cannot be accomplished without an appeal to context. The level of this appeal, if beyond the indexicality of the minimalist, has significant repercussions for the formalist's above semantic/pragmatic distinction.

For Recanati, the fundamental question for contextualists is whether truth can be ascribed to natural language sentences or whether, perhaps due to a lack of content and indeterminacy, truth can only be evaluated at the level of utterances in context, the point at which content can be disambiguated (RECANATI, 1994, p. 156). Recanati frames his arguments against the 'non-contextualist' claim that an 'eternal sentence' exists that holds in any context. In terms of indexicals, one of the only elements that allows for an appeal to pragmatics, if a sentence containing 'I' or 'he/she' is replaced with a semantically complete linguistic item, then this sentence may be considered an 'eternal sentence'; that is to say, no appeal to context will be required.



Perhaps a more concerning example for a formal account is a sentence that would seemingly contain no ambiguity. Recanati (1994, p. 161) analyses the sentence: ‘some triangles are equilateral’. Ostensibly, the truth of this sentence is ‘eternal’. However, a child asked to draw a number of triangles in their notebook with some being equilateral may utter the sentence: ‘some triangles are equilateral’, and then be told that in fact their equilateral triangles do not meet the standard required, i.e. ‘not all three sides are of exact equal length due to your scruffy writing’ and, therefore, ‘no triangles are equilateral’. Interestingly, the second statement would also be considered an ‘eternal sentence’ and further highlights the consideration of context. In sum, Recanati’s argument against ‘eternal sentences’ is one of quantification. His argument is that the universal domain of quantification constitutes one context among many other possible contexts (RECANATI, 1994, p. 162). Therefore, ‘eternal sentences’ do not highlight semantic completeness as there is still an appeal to context even at the universal level. Recanati’s (1994, p. 170) argument for contextualism is:

Whether or not one believes that there could be eternal sentences, one should at least adhere to a weak form of contextualism ... a difference between the linguistic meaning of the sentence and what is said by an utterance of the sentence, and correlative difference between the linguistic meaning of an expression – whatever it is – and the contribution the expression makes to the proposition expressed by the sentence where it occurs.

It is this last part, which mentions ‘the proposition expressed’, that potentially is of central importance. This is because the minimalist would maintain that propositional content is semantically constituted, with only a ‘minimal’ allowance for ‘pragmatic intrusion’, whereas the above posits that ‘the proposition expressed’ is ‘enriched’ by pragmatic processes at the level of utterance, perhaps beyond indexicality.

This idea of how pragmatics ‘enriches’ propositional content beyond indexicality is elaborated on further when considering two types of pragmatic processes outlined by Recanati (2004, p.23-26). These are primary pragmatic processes and secondary pragmatic processes. The latter are ‘post-propositional’ in that they take place after a proposition ‘p’ has been expressed. This level, at least on the surface, would not necessarily concern a minimalist as it corresponds with their interpretation that pragmatic processes are mainly secondary to a consideration of propositional content. However, primary pragmatic processes, for which three will be explained here, are ‘pre-propositional’ and ‘unconscious’ and, therefore, would concern the formalist (RECANATI, 2004, p.23). The first is ‘saturation’. This can be seen as comparable to the assignment of reference to indexicals, and Recanati himself points out that ‘saturation’ is linguistically mandated (a ‘bottom-up’ process). However, the second and third primary process are seen as ‘top-down’ and are contextually mandated rather than linguistically.

The second is ‘free enrichment’. This relates to ‘unarticulated constituents’, which has also been explored by Carston (1999). In the sentence ‘I took out my wallet and paid’, there exists a number of syntactically covert ‘unarticulated constituents’. These could be ‘I took out my wallet and paid (the bill)’ or, to go even further, ‘I took out my wallet and paid (the bill to the barman with the money in my wallet)’. What should be clear here is that what was paid is not explicitly articulated, nor is it easy to see how the articulation of this propositional content is semantically or syntactically mandated. According to Recanati (2004, p. 24-25), ‘enrichment’ leads to a more contextually explicit interpretation, one which would affect truth-evaluation and must, therefore, constitute propositional content. He does offer a possible defence for a formal, compositional approach in that they might argue that the concept PAID includes the ad hoc. concept PAID\_THE\_BAR\_MAN or PAID\_THE\_BILL. However, this would require an almost exponential number

of ad hoc concepts for any generic concept. Taking this into account, it feels, at least intuitively, preferable to allow for contextual, pragmatic enrichment.

A third primary pragmatic process is ‘strengthening’ and ‘loosening’. This relates to ‘unarticulated constituents’ and would mean not having to supplement concepts with an infinite amount of ad hoc. concepts. ‘Strengthening restricts the application of a predicate by providing contextual conditions that are not linguistically mandated’ (RECANATI, 2004, p. 26). This would mean that the concept PAID would not have to include the ad hoc. concept PAID\_THE\_BILL, as the ‘strengthening’ would be contextual. Equally, ‘loosening’ would achieve the same purpose. In the example given in the introduction, the predicate includes the concept GLOOMY. It may be argued that the interpretation of GLOOMY is metaphorical in relation to the mood of the students. This metaphorical interpretation could be achieved by ‘loosening’ the concept, rather than having to include a separate meaning.

To summarise this section, Borg views propositional content as being largely semantically complete with only a ‘minimal’ appeal to pragmatics. Recanati and contextualists argue that pragmatics plays much more of a determining role in propositional content, for Recanati through primary pragmatic processes, and that this has significance for truth-evaluation. In other words, Borg believes that an evaluation of truth conditions can be evaluated at the semantic level, while contextualists, especially Recanati, maintain that it can only be evaluated at the utterance level with an appeal to context. This brings into question Borg’s understanding of the cognitive process of the mind, namely the computational, modular account of mind. However, before discussing that in more detail, it must be noted that Recanati (1990; 2004) admits that his above arguments cannot be seen as final. A further area of analysis that may prove problematic for a minimalist account

is in how the presence of colour adjectives may affect the truth values of a proposition, an element of language Borg explicitly states (2004b) as being semantic and not open to an appeal to context.

## 2 Colour adjectives and language processing

Hansen (2011, p. 203) sees colour adjectives as potentially providing essential support for a theory grounded in contextualism, but only if it can be shown that ‘the content of a sentence can vary in unpredictable and open-ended ways’. Conversely, if a formal theory can account for contextual variation, then contextualism would be equally challenged.

In his paper, Hansen (2011) explores a semantic account of colour adjectives from the position of Kennedy and McNally (2010). In the example ‘the leaves are green’, the proposition would be evaluated even if they had been painted. However, if a botanist were to request green leaves for their study, the same person may determine the same proposition to be false. This could be considered an argument for contextualism in that the context plays a definitive role in the determination of the truth or falsity of the propositional content. However, Kennedy and McNally (2010, cited in Hansen, 2011, p. 209) would argue that colour adjectives are in fact gradable and that this gradeability accounts for the semantic ambiguity found in the above example. Using this, the true reading above would be accounted for by seeing the adjective ‘green’ as gradable and the false reading by appealing to the non-gradable reading. This would, in theory, serve to counter arguments of context by seeing the semantics as triggering an appeal to context. Moreover, this would help build an understanding of the variety of ways that context contributes to determining linguistic meaning.

While the above allows for a scale of gradable and non-gradable adjectives, many other scales would have to be presented to allow for a full

determination of how context may influence or determine semantic meaning. For example, questions would have to be answered regarding which parts of an object are relevant in the determination. An apple for example may be considered green on both a gradable and non-gradable reading, but only in reference to the skin of the apple. That is to say, the assessment of 'green' is not applicable to the entity as a whole, namely the flesh and core which would not be evaluated as 'green'. In answer to this, Hansen (2011, p. 211-216) suggests an object and stimulus frame of reference. The object frame constitutes the normal conditions for viewing and evaluating an object, whereas the stimulus frame considers how the object looks in the here and now, which would account for differences in visual systems. For example, after exposure to sunlight, colours may be judged to be different. Similarly in darkness a classification of colour may be different to a determination from the object frame. These two frames of reference would mean semantics could preserve the concept of 'greenness', by placing the truth variation at the level of context in which the speaker makes the statement, such as in the dark or light. Determining colour based on the 'relational metaphysics' of colour and properties of objects may help preserve a semantic account of the kind of variations apparent in truth conditions at the propositional level. This would, however, require a revision to the minimal approach outlined by Borg, one that allows for a broader appeal to context than just indexicality. Beyond this, to preserve a formal account, far more appeals to 'untameable context sensitivity' would have to be accounted for by some form of semantic or syntactic triggering (HANSEN, 2011, p.219).

Although it may be possible to achieve the endeavour of semantically outlining all appeals to context, what should be overtly clear at this juncture is that a minimalist approach must acknowledge appeals to pragmatic intrusion beyond the level of indexicals. Indeed, Borg (2006) does tacitly concede to this in her review of Recanati's *Literal Meaning*, where she states

(2006, p. 465) if we accept that semantics can only account for 'minimal propositions' (incomplete until pragmatically enriched), then 'it is at least open to the formal semanticist to find work for minimal propositions to do, even if they withdraw from the arena of explaining communication' (RECANATI, 2006, p. 465). Our argument to the above is that rather than go to great lengths to reason how semantics can account for and trigger contextual reference, why not view the variation at the propositional level in terms of a primary pragmatic process, i.e. 'loosening' and 'strengthening'.

As outlined above, a primary concern for Borg of maintaining a formal semantic account is rooted in processing language: Fodorian modularity provides the best modal of our cognitive architecture with respect to linguistic comprehension (2004, p. 221). Borg cites evidence in the speed of linguistic comprehension, its domain of specificity and the encapsulation of semantic content and patterns of breakdown. This, without detailing the experiments, would perhaps support the idea that semantic processing comes before pragmatic considerations.

However, Bezuidenhout and Cooper Cutting (2002) cite evidence that may suggest that minimal (semantic) and enriched (pragmatic) readings are processed simultaneously. They conducted four experiments each looking at enriched and minimal interpretations of target sentences in stories. After being presented with sentences, randomly ordered, participants could choose a minimal paraphrase or enriched paraphrase based on which best expressed what was said by the target sentence in a story. The timings of the choice were recorded and it was found that final sentence reading times were slower in minimal as opposed to enriched contexts. Additionally, it was suggested that the evidence supported the claim that enriched interpretations were more accessible, although the authors questioned this finding in the discussion based on cases where the minimal proposition may be considered more accessible, i.e. out of context. While more discussion and evidence



is needed to support this, overall, their results seems to add credence to the theory that pragmatic and semantic processing is simultaneous, which has serious implications for a computational and modular modal of ‘our cognitive architecture’.

## Conclusion

It has been argued in this essay that a ‘minimal semantic’ theory does not fully encapsulate the levels or scope of appeal to context that is needed at the propositional level to evaluate truth. Such appeals have been highlighted in proper nouns, unarticulated constituents and, most objectively, in colour adjectives. While attempts to explicate how semantics can account for contextual contributions to meaning are sophisticated and persuasive within certain examples (namely gradable and non-gradable readings), context can permeate to such an extent that a full-account may be beyond the semanticist. This, with obvious scepticism, may well be evidence for the need to further explore pragmatic processes that act at the propositional level (e.g. Recanati’s primary pragmatic processes).

Moreover, once it is accepted that and understood how pragmatics enriches propositional content, then processing theories can be evaluated and explored to better map the cognitive architecture of the mind. The brief discussion above seems to counter evidence presented by Borg in suggesting that semantic and pragmatic features are simultaneously processed. It has not been within the scope of this essay to criticise a computational and modular view of mind, but the exploration of how pragmatics operates does bring into question the sequential view of processing advocated by the minimalists. In other words, the view that pragmatic processes are secondary to semantic processes has been drawn into question and, instead, a more plausible account is that the two processes are parallel.

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