Research Article

# Grice's Café – Coffee, cream, and metaphor comprehension

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**Some theorists argue that Grice's account of metaphor is intended as a rational reconstruction of a more general inferential process of linguistic communication (i.e., conversational implicature). However, there is a multi-source trend which treats Grice's remarks on metaphor as unabashedly psychological. The psychologized version of Grice's view runs in serial: compute what is said; reject what is said as contextually inappropriate; run pragmatic processing to recover contextually appropriate meaning. Citing data from reaction time studies, critics reject Grice's project as psychologically implausible. The alternative model does not rely on serial processing or input from what is said (i.e., literal meaning). I argue the serial processing model and its criticisms turn on a misunderstanding of Grice's account. My aim is not to defend Grice's account of metaphor per se, but to reinterpret auxiliary hypotheses attributed to him. I motivate two points in relation to my reinterpretation. The first point concerns the relationship between competence and performance-based models. To the second point: Several of the reinterpreted hypotheses make predictions that are largely consistent with neurolinguistic data.**

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## 1. Introduction

Grice did not say much about metaphor. What he did say about it followed almost entirely from his treatment of conversational implicatures (CIs).[1] This has not prevented the widespread use of the phrase 'Gricean model' within metaphor research.[2] What precisely the Gricean model amounts to, and its applied interpretation—as an empirical processing model—is important to those of us working within metaphor research for at least two reasons. It engenders an analytic claim about rational conversational practices, and it naturally lends itself to be understood as generating certain testable hypotheses. The empirical model attributed to Grice is typically used as a foil to alternative models—a valiant first attempt at understanding metaphor processing; but hopelessly naïve from our current perspective. Critics claim that the rational model falsely predicts that certain processes obtain during the comprehension procedure and that Grice posits psychologically implausible patterns of thought called upon in the determination of metaphorical meaning. I argue that the explanatory failure attributed to Grice turns on a strawman by carefully weighing his rational programme against the empirical model it allegedly engenders.

Additionally, I seek to determine which sorts of empirical claims are in fact licensed by Grice's rational account. I ask two follow up questions: Whether the task can be done in good faith, and whether it provide research with an alternative, empirically useful account of metaphor processing.

To anticipate my general conclusion, I claim that Grice's comments on metaphor are useful in developing alternative empirical models that withstands criticisms against the indirect model.[3] This would, in principle. leave open the possibility for one to develop a more rigorous empirically oriented research programme. Nevertheless, my reinterpretation of the Gricean model is limited to what Grice had to say about metaphor. As such, it's incomplete. In section 6, I specify in which ways.

Grice's account of metaphor has been attacked on two fronts as psychologically implausible: On one front, it's criticized by psychologically oriented pragmatic accounts (e.g., Bezuidenhout, 2001; Carston, 2008; Hills, 2004; Nogales, 2012; Recanati, 2001; Sperber & Wilson, 2008; Stern, 2000), and on the other front from cognitive linguistics (e.g., Gibbs, 1990; Gibbs & Tendahl, 2006; Lakoff & Johnson, 1980; Thibodeau & Durgin, 2008).[4] Members from both camps share the core assumption that "metaphors are immediately comprehensible by the linguistic system and do not involve additional cognitive resources [in comparison to literal language]" (Patalas & de Almeida, 2019, p. 2530). Admittedly, this characterization is a blanket statement that serves to cover the wide diversity of the positions in question.[5]

To abstract from the many differences among these two camps and capture their shared assumptions, I follow influential scholarship (Bambini, Bertini, Schaeken, Stella, & Di Russo, 2016; Bambini & Resta, 2012a, 2012b; Bosco et al., 2018; Patalas & de Almeida, 2019; Weiland, Bambini, & Schumacher, 2014) in referring to this group as 'direct access theorists'. Direct access theorists support and promote a 'direct access model' (hereafter: direct model) of metaphor interpretation.[6] This model has been marketed as a psychologically plausible competitor to the indirect access model (hereafter: indirect model). [7]

The issue I address is whether and in what ways the empirical claims attributed to Grice are licensed by his rational model. I argue that the indirect model is based on an equivocation between the pragmatic logic of implicature interpretation and an empirical comprehension procedure. The latter carries with it assumptions that cannot reasonably be attributed to the former. I refer to the indirect model as a strawman. I defend the Gricean model from the strawman by rejecting a subset of the auxiliary hypotheses based on current streams in pragmatics investigating CIs (and by extension, metaphor). If the argument is valid and persuasive in anyway it opens up a research space to pursue a broadly Gricean project in a more research-intensive way.

I do not intend to defend Grice's project in all it's details. I acknowledge that Grice's rational model has significant shortcomings (see section 2 and 6)—of course, we can't expect him to have covered everything! It is partially by virtue of this fact that I take utmost care in my interpretive endeavour.

The article is laid out in the following way: Section 2 provides Grice's comments on metaphor and raises several issues to bracket some and focus on others. Section 3 provides illustration of the commitments and predictions of the indirect and direct models. I discuss the aims of Gricean pragmatics, the logic of CIs and (by extension) metaphor. With the previous discussion in mind, I judge the indirect model to be a caricature of Grice's rational programme. Section 4 is the pivot of the article. Guided by the discussion of the previous section, I circumvent the strawman by reinterpreting Grice's views in a more empirically charitable way. Section 5 surveys current psycholinguistic evidence on metaphor processing. The data from these studies acts as a foil to the predictions of the direct model and my revised predictions for the Gricean model from the previous section. Section 6 highlights those aspects of Grice's theory of metaphor that are in want of elaboration, and where it simply goes wrong. Section 7 offers some concluding remarks.

## 2. Grice and metaphor

Nearly all that Grice had to say about metaphor is found in a few short passages in "Logic and Conversation". His treatment of metaphor is an extension of the more general discussion of CIs, the Cooperative Principle (CP), and the further subordinate maxims of conversation. This framework provides a tool for understanding how discourse participants negotiate meaning beyond an utterance's semantic profile.

According to the Grice, speakers intend for their audience to recognize the content of a CI based on mutually shared rational principles and maxims of conversation, particular facts about the meaning of the sentence uttered (implicating their semantic competence) and the context of utterance (implicating their pragmatic competence). Of metaphor, Grice writes:

> Examples like You are the cream in my coffee characteristically involve categorical falsity, so the contradictory of what the speaker has made as if to say will, strictly speaking, be a truism; so it cannot be THAT that such a speaker is trying to get across. The most likely supposition is that the speaker is attributing to his audience some feature or features in respect of which the audience resembles (more or less fancifully) the mentioned substance (Grice, 1975, p. 53).

Grice's just-quoted single example of a metaphor is "you are the cream in my coffee". He claims that the speaker flouts the first maxim of quality and thereby conversationally implicates some further proposition where the intended meaning 'more or less fancifully' resembles the cream in the speaker's coffee. So, for Grice, a speaker utters a sentence that p ('you are the cream in my coffee'), whose meaning is fixed by the conventional meaning of the sentence. The speaker makes it obvious to the auditor that her main communicative intent is to convey something different, that q (e.g., 'you are an important part of my life', etc.) given mutually shared assumptions made relevant by the sentence uttered and the context in which it occurs.

I would like to point out several issues that philosophers of language have taken with Grice's formulation if only to bracket some of them to clarify my own position on their importance and relevance to my present aims.

First, Grice assumes speakers flout the maxim of quality to produce a metaphor. Some commentators suggest that this requires deliberate and rational thinking process that are psychologically implausible. It is true, as Recanati (2001) has pointed out, that the interpretation of many metaphors do not seem to require lengthy, on-line reasoning processes to determine their meaning. But it is also true that novel, creative and poetic metaphors involve more explicit reflection to determine their often complex and nuanced cognitive import. A general theory of metaphor must account for these two observations. So far, Grice's own view seems to intuitively capture only the latter type.

There is a second and related worry to the previous point concerning novel, creative and poetic metaphors. Pragmatic theories in general—not simply Grice's—fail to address the fact that metaphors are often used to bring about psychological effects that are not easily captured in truth-conditional terms. Often, metaphors serve as tools to induce new ways of thinking and feeling about some topic (Camp, 2003, 2006b, 2008; Davidson, 1978). Grice's own example above evokes a complex and nuanced set of attitudes and perhaps imagistic qualities of the speaker's intended referent. Failure to appreciate this fact points to a lack of the explanatory resources in Grice's account required to make sense of the array of communicative effects other than the transmission of truth-conditional content (Camp, 2003, p. 39–40). Because we systematically use language to convey more than just propositional content, we need some explanation as to how we carry this out.

A third problem is the vagueness of Grice's account of figuration more generally. He tells us that the interpretation of metaphor and other figurative uses of language, such as irony and hyperbole involve calculating some related, speaker-intended proposition. What is unclear is how auditors can discriminate between tropes. In other words, Grice underspecifies the interpretation procedure that guides the auditor in inferring metaphorically intended content from hyperbolically or ironically intended content. This is viewed by some as an egregious oversight by Grice's rational account. Despite this charge, some Gricean-inspired accounts (Camp, 2003; Searle, 1993) regard Grice's generality as a virtue of the theory because it "demonstrates that we are appealing to principles of interpretation we already need for other purposes" (Camp, 2003, p. 36).

Fourth, Grice tells us a speaker is 'making as if to say' something categorically false in uttering a metaphor. If we ask the question: 'Where do implicatures come from?', Grice's own remarks suggest, and some of his commentators seem to agree that implicatures arise when the speaker gets across more than she says. More precisely, implicatures are carried by the saying of what is said. However, making as if to say is a case in which nothing is said. As such, it is not clear that there is any vehicle by which the implicature is carried.[8]

Fifth, contrary to Grice's claims, it is not necessary for metaphorical utterances to be 'categorically false' (and thus violate the maxim of quality). In some cases, an utterance is "semantically unimpeachable but can still be used metaphorically" (Camp, 2003, p. 6). To wit, in some metaphors, the question of truth doesn't even come into play. To illustrate this point, consider: a twice-true metaphor (1), a negative metaphor (2), and an imperative metaphor (3):

(1) Moscow is a cold city

(2) Bill is not a wolf

(3) Go out there floating like a butterfly and stinging like a bee!

In each example, the speaker does not mean what is literally encoded, but intends the auditor to interpret the utterance metaphorically. In (1) the literal meaning is true. While (2) and (3) do not a convey a true affirmative proposition. (2) is a negation, and what is said is true, while (3) is an imperative so that there is no proposition being asserted. If a metaphorical meaning is triggered by its blatant falsehood, then Grice's account does not provide us with an obvious way to deal with these cases.

Sixth, most theories of metaphor (Grice's included) tend to focus on the standard [a is (an) F] form. However, metaphors vary in their structure. As such, they introduce a whole series of interpretive complexities for pragmatic approaches. Consider a non-exhaustive list of some of these lesser-studied metaphorical structures: [9]

(4) Odysseus has returned home

The above represents an example of a metaphorical use of a (fictional) proper name.

(5) A sharp mind can solve this problem

The above represents an example of an adjectival metaphor.

(6) The sun blazes bright today; the clouds flee from his mighty beams

The above represents an example of a sentential metaphor.

In this last case, the entire sentence metaphorically describes some unmentioned situation (Camp, 2006c, p. 161). For example, (6) is a description of Achilles on the battlefield.[10]

Finally, Grice's account cannot explain the unidirectionality of metaphorical interpretations. I explain what I mean by way of examples. Consider the following two utterances:

(7) Some surgeons are butchers

(8) Some butchers are surgeons

The propositions expressed by (7) and (8) are logically equivalent: $(\exists x)(Sx\&Bx) = (\exists x)(Bx\&Sx)$. If what is said is the truth-conditional content, one must conclude that what is said by (7) and (8) are the same. However, what is said (for Grice) may be more than the truth-conditional content. Bach has suggested that what Grice has in mind by what is said should be taken as a structured proposition:

(7s) [SOME, [CONJ, [[*x* is a surgeon], [*x* is a butcher]]]

(8s) [SOME, [CONJ, [[*x* is a butcher], [*x* is a surgeon]]]

SOME is the property of being a non-empty set, CONJ is the truth function of conjunction. Commutativity of conjunction is a law of classical logic. So, it is difficult to determine how these propositions are different. If they express the same structured proposition, then what is said is the same in both cases. If these two utterances say the same thing, and what is said carries the implicated content, then how can (7) and (8) generate different interpretations (i.e., how can (7) implicate something negative about surgeons, whereas (8) implicates something positive about butchers)?[11]

Despite these issues, I don't think they undermine the general picture I aim to develop because I'm not interested in ironing out (what Devitt (2021) refers to as) the 'metaphysics of the meaning-properties' of metaphors (i.e., addressing the question: 'what is a metaphor?'), nor am I interested in what speakers do in uttering a metaphor so much as I am with identifying the process by which hearers generate metaphorical interpretations[12] (although I acknowledge that what I claim about the interpretation process may partially constrain how we address these questions). For these reasons, I set aside issues four to seven above,[13] while keeping one to three in mind as I proceed. On a related note, I do not enter the Literalist-Contextualist controversy on the place of metaphor in interpretation.[14] Rather, I leave it up to the reader to decide whether my interpretation of Grice comports well with views that treat metaphor as a species of implicature, if its implicature-adjacent or something else altogether.

## 3. The psycholinguistic strawman

In general, it is assumed that metaphorical interpretations, like other conversational inferences (i.e., scalar implicatures, conversational implicatures, etc.), involve a stage of computation whereby the auditor generates inferences about the speaker's communicative intention.[15] I mentioned in section 1 that Grice's theory of metaphor begins from the intuition that in speaking metaphorically, speakers undertake speech acts conveying contents that are distinct from the linguistic meaning of the sentence uttered. Metaphor interpretation requires reasoning about the speaker's manifest communicative attitudes and intentions, together with the conventional meanings of the words uttered and their mode of combination, and the larger conversational context.

Grice's project is often misrepresented as providing a description of the utterance comprehension procedure (Bach, 2005; Camp, 2003; Geurts & Rubio-Fernández, 2015; Moore, 2014; Saul, 2002b). Grice never speculated about psychological process nor "temporal development of cognitive processes behind metaphor" (Bambini & Resta, 2012a, p. 42). Nevertheless, Grice's rational reconstruction of the pragmatic logic involved in communication "paved the way to a consideration of pragmatics at the interface between language and cognition" (Bambini & Resta, 2012a, p. 38). So-called 'cognitive pragmatics' approaches take this latter orientation. One highly influential research programme aimed at developing a comprehensive cognitive pragmatics is Relevance Theory (RT).[16] According to RT:

> 'pragmatics' is a capacity of the mind, a kind of information-processing system, a system for interpreting a particular phenomenon in the world, namely human communicative behaviour[…] It is a proper object of study itself, no longer to be seen as simply an adjunct to natural language semantics. (Carston, 2002a, p. 128–129)
>
> The components of the theory are quite different from those of Gricean and other philosophical descriptions; they include online cognitive processes, input and output representations, processing effort and cognitive effects. (Carston, 2002a, p. 129)

The quotes above seems to suggest an alternative way to conceive of the object of study in pragmatic research. Of course, disputes may arise as to what pragmatics ought to study, but this doesn't seem like an indictment of Grice's project qua rational model.

The two approaches may peacefully coexist—in principle. So, what of the controversy? Well, consider Wilson's (2000) remarks on Grice's claims about deriving conversational implicatures (and therefore, metaphors). She writes:

Grice seems to have thought of the attribution of meaning as involving a form of conscious, discursive reasoning […] It is hard to imagine even adults going through such lengthy chains of inference in the attribution of speaker meanings. (Wilson, 2000, p. 415–416 – italics mine)

Geurts and Rubio-Fernández identify three assumptions (read: misconceptions) at work in Wilson's understanding of Grice project:

1. Gricean pragmatics adopts a mentalistic stance in the sense that it is concerned with the internal states and processes underlying interpretation.
2. These states and processes are available to consciousness.
3. It's all way too complicated: in reality, interpretative processes are a lot simpler than Grice would have us believe.

Origgi and Sperber (2000), Sperber and Wilson (2002) and Millikan (1984: 69) raise similar issues about Gricean communication arguing that it is a non-starter because it involves intentions about intentions, etc., and the recognition of all these higher-order intentions on the part of the auditor. Even though RT acknowledges Grice is concerned with pragmatic logic, we can observe that they nevertheless equivocate the rational model of interpretation with the empirical model of metaphor comprehension. Witness the equivocation in Carston's claims below.

> Grice intended his account as a reconstruction in wholly rational analytical terms of whatever subpersonal processes actually go on in comprehension. (Carston, 2012, p. 474)

Compare the above with the subsequent text:

> However, in the early days of experimental investigation of the online processing of non-literal language, Grice's work was the dominant pragmatic account, so experimental psychologists took it as the starting point for constructing a processing model. As such, it predicts that the interpretation of a metaphorical utterance (or, indeed, the interpretation of any of the other tropes) is a three step process: (a) the hearer, expecting literal truthfulness (as required by the maxim of truthfulness), tries the literal interpretation first; (b) then rejects it on the basis of its blatant falsehood (or blatant uninformativeness or irrelevance); and (c) then proceeds to infer the intended nonliteral interpretation [...] The prediction, then, is that a metaphorical use of language should take longer to process and understand than a comparable literal use. This hypothesis has been extensively tested and has repeatedly been found to be false. (Carston, 2012, p. 474–475 – italics mine)[17]

Further, she claims that:

> construed as a comprehension model, Grice's account of metaphor fares badly and its not clear that its construal (merely) as a rational reconstruction stands up against evidence of this sort either. (Carston, 2012, p. 475 – italics mine)

Carston writes that implicatures must be calculable.[18] She states that the inference process requires that "the implicature and what is said (the 'explicature' in her terminology) to function independently in the hearer's mental life. This, she says, requires that what is implicated cannot entail what is said" (Saul, 2002b, p. 360). The demand that what is said and what is implicated 'function independently...' leads RTs to treat the comprehension process is explicit to the auditor and 'calculated' in discrete, sequential stages (Figure 1):

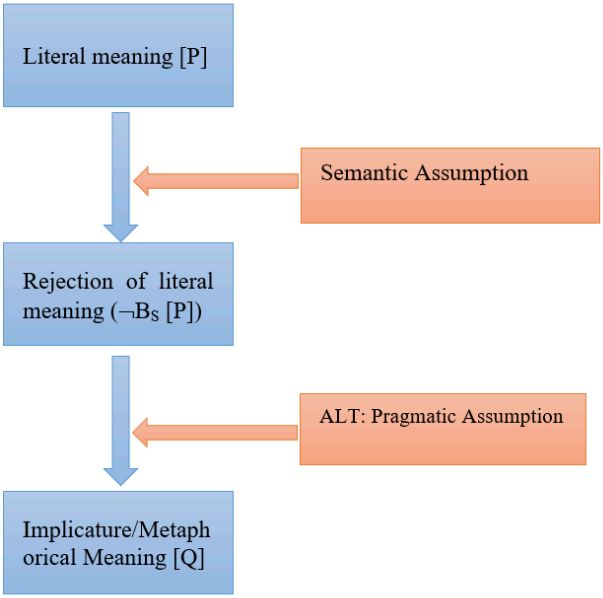


**Figure 1.** Indirect access model: Serial processing stages in the computation of meaning for utterances with potential metaphorical implicatures.

The metaphorical meaning [Q] is a member of a set of possible pragmatic alternatives Q{Q, Q', Q'', ...} that function on the conventional/literal meaning of the sentence [P]. I capture this more succinctly in the following way: [Q] ALT[Q].

In Gricean terms, [P] represents the content of what is said/making as if to say, i.e., the content of the sentence assigned by the grammar together with the assignment of values to indexicals, resolution of ambiguity, and reference fixing[19]. The semantic assumption provides the auditor with a means to reject [P]. Here, ($B_S$[P]) means the speaker does not believe [P]. The auditor's semantic competence in a language, L, aids in their assumption that the speaker, S, did not mean to say that [P], but something else [Q]. The pragmatic assumption, among other things, is the assumption that the speaker is being cooperative and intends to mean something beyond the meaning of the sentence [P].

The auditor uses contextual information, background knowledge, and mutual beliefs about the discourse context and inferences about the speaker's intentions to provide themselves with a set of defeasible, alternative (ALT) meanings, where one or more of the alternative propositions [e.g., Q, Q', Q'', etc.] are part of the speaker's intended meaning [Q]. The crucial point is that the model sketched above is said to follow from Grice's own words.[20]

Accordingly, the indirect model is cashed out as a serial processing model where the metaphorical meaning is generated by a clash with the literal meaning of the utterance in some context, C, and what the auditor believes about the speaker's intentions ($B_S$). Here is the process restated in discrete computational stages:

- Stage 1: Compute the conventional meaning of the utterance, [P].
- Stage 2: Given the clash between semantic and contextual input, reject [P].
- Stage 3: Calculate contextually appropriate meaning, [Q].

Here, the literal meaning, [P], acts as input in the determination of the figurative meaning, [Q]. Importantly, the meaning, [Q], conveyed by the speaker is constrained by the conventional meaning, [P]. If we put this picture together with Wilson's and Carston's comments above, we can identify five auxiliary hypotheses that constitute the indirect model:

i. The comprehension procedure is a serial process;
ii. The processor always begins from conventional word meaning and proceeds to the metaphorical meaning in discrete stages;
iii. The utterance's literal meaning facilitates metaphor comprehension;
iv. The process is explicitly available (i.e., available to consciousness);
v. metaphor processing exerts extra cognitive cost relative to literal control items.

The above is said to 'naturally follow' from Grice's comments suggesting a clear picture from which we derive empirical predictions. Although it is quite tempting to understand Grice's rational model as one that delineates empirically testable hypotheses in the way captured above, we should not be led into temptation.

### *3.2. From competence to performance*

Grice's rational model belongs to a theory of competence; investigation into psychological processes belongs to a theory of performance.[21] The former specifies how an audience determines the content of a metaphorically used expression—whether an auditor succeeds is another story.[22] By taking into consideration those who succeed in grasping the metaphorical content, Grice implicitly introduces an ideal situation. Hearers who succeed approximate ideal audiences So, claims about how audiences derive such content are claims approximating ideal rational audiences and are therefore not empirical. Theories of competence make no predictions about how our knowledge systems are used to answer questions about, for example, the length of time it takes to compute the inferences or whether such inferences are 'cognitively costly' in comparison to some other class of linguistic stimuli.

Saul (2002a) has argued convincingly that the actual working out of an implicature by an audience is not included in the conditions for conversational implicature as laid out by Grice. Grice himself suggested that implicatures may well be grasped intuitively. Calculability is not actually calculating. For an implicature to be calculable, Grice requires only that the intuition be replaceable by an argument.[23]

Of course, there have been attempts to relate competence models to performance models. For example, Bresnan & Kaplan's (1982) 'Competence Hypothesis' spells out a means for doing so. Relating competence models to performance models requires the generation of auxiliary assumptions determining the performative aspects. My reading of much of the experimental literature on metaphor involving Grice's competence theory is that the model has been unduly extended to a theory of performance by over generating assumptions said to be engendered by his rational model. These assumptions attributed to Grice by direct access theorists are precisely what are at issue.

How we eventually specify a processing model is undoubtedly a matter of empirical discovery. But doing so departs from Grice's project. This is not to say that we cannot derive an empirical model from Grice. Rather, in our efforts to do so, we must be alive to fact that extending a rational model to a competence model requires generating auxiliary hypothesis. The task is but interpretive—and faithful interpretation requires a certain level of fidelity to the source through careful exegesis. The remainder of this section compares the auxiliary hypotheses of the indirect model to the direct model. The latter is committed to the following three hypotheses:

I. metaphor processing is direct;[24]
II. metaphor interpretation is automatic;[25]
III. metaphor interpretation exerts no extra cognitive cost relative to literal control items.

I illustrate the direct access model in Figure 2:

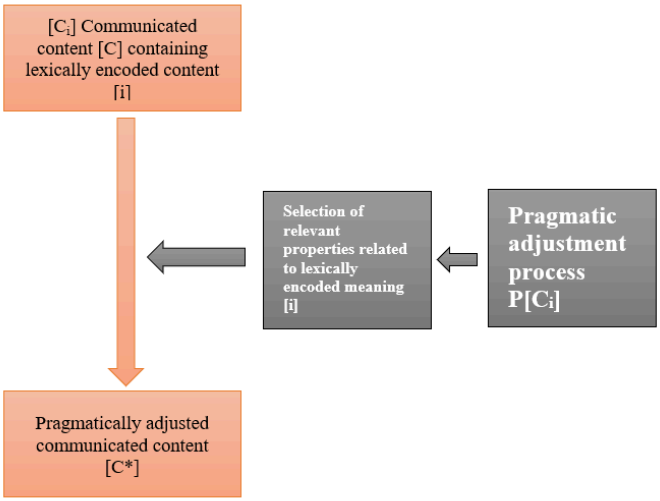


**Figure 2.** Direct acess model: Processing stages in the computation of meaning for metaphorically intended utterances.

Here, the communicated content [C] includes lexically encoded concepts containing encoded information [i]. P is a function of pragmatic adjustment which includes a contextual parameter. The utterance of [$C_i$] results in a selection process of the relevant information contained in it that will be raised to contextual salience. P operates over the communicated content to adjust [$C_i$] yielding the actually communicated content [C*]. Unlike the Gricean model, there is no semantic assumption which yields the conventional meaning of the sentence. Rather, the processor pursues a path from the content expressed to generate a contextually strengthened meaning. Thus, the path from [$C_i$] to [C*] is direct (I). The application of the pragmatic function is obligatory, and therefore automatic (II). Finally, this process is universal. That is to say, the process that yields meaning for literally intended speech is the same (or nearly similar) in hyperbole, approximation, and metaphor. Therefore, it predicts (pace indirect model) that metaphorical speech exerts no extra costs relative to literally intended speech (III).

My aim in the next section is to consider whether the sorts of auxiliary hypotheses attributed to Grice are in fact licensed by his competence model. After some discussion concerning the competence/performance distinction, I conclude by arguing that a Gricean performance-based model need not be as computationally 'hopeless' or 'psychologically implausible' as suggested by direct access theorists. The discussion leads me to postulate a more streamlined performance model.[26] However, we shall see that such a model is not without deficits.

## 4. Avoiding the strawman

A rational explanation is concerned with identifying "What makes a certain metaphorical meaning φ derivable?", whereas a psychological explanation asks "What do conversational participants do in order to derive the metaphorical meaning φ?" (see Yavuz, 2018, p. 20). [27] I argued above that Grice has been systematically misrepresented as pursuing the latter question—despite the fact that authors often acknowledge Grice's pursuit of the former question. Here I continue this line of argument. Among the misrepresentations, one powerful misconception, noted by Bach (2005), conflates the logic of implicature calculation with the sequential and discrete stages of implicature processing:

> It might seem, then, that grasping what someone implicates requires first determining what they are saying. However, this is not true and something that Grice was not committed to. It's a mistake to suppose that what is said must be determined first or to suppose that Grice supposed this. (Bach, 2005, p. 7)

Bach argues this has led to a variety of criticisms aimed at conversational implicatures. Undoubtably, the mischaracterization has played a major role in attributing to Grice auxiliary hypothesis (i)-(ii) outlined above. As Bach notes, there are numerous cases where it seems clear-cut that an auditor determines the implicature well before the speaker finishes what s/he said. Often these calculations are made on the fly and do not require discrete stages of serial processes (i.e., a series of discrete stages of calculation and rejection of the relevant input).

> [I]f in response to an utterance of "No man is an island," someone says "Some men are peninsulas, some men are volcanoes, and some men are tornadoes," in order to figure out what the speaker means you do not have to figure out first that he does not mean that some men are peninsulas, some men are volcanoes, and some men are tornadoes. Similarly, if you're discussing a touchy subject with someone and they say, "Since it might rain tonight, I'd better bring in the laundry, clean out my parents' gutters, and find my umbrella," you could probably figure out before they were finished saying all this that they were implicating that they didn't want to discuss the touchy subject any further. (Bach, 2005, p. 8)

Recall that critics charge Gricean pragmatic reasoning as being far too complex, and label it a psychological fantasy.[28] It seems possible to pursue two alternative lines of argument in support of Grice. First, we may ask ourselves: What if the dissenting view is correct and Gricean pragmatics is too mentalistic? Tied to this claim is the idea that the inferences that are involved must be consciously available to the reasoner. As far as I can tell, there is no reason to suppose that this is the case—consciousness is somewhat of a red herring.

Secondly, if pragmatic processes are not always open to conscious reflection, then armchair judgements as to their complexity must be qualified. There is no good reason to suppose that unconscious processes are simple. Geurts and Rubio-Fernández ask us, somewhat rhetorically:

> What could be easier than seeing a chair, for example? Anyone with normal or corrected-to-normal vision can do it; even young children do it with ease. Nevertheless, all textbooks agree that the mental processes underlying visual perception are bafflingly intricate, and the complexity of Gricean reasoning pales when compared to that of seeing a chair. If we are to gauge the complexity of mental processes, introspective evidence is as good as no evidence, and more misleading. (Geurts & Rubio-Fernández, 2015, p. 452).

The point I wish to draw attention to is that the Gricean framework describes the constitutive 'ingredients' for metaphor interpretation, the purpose of which is to

> make explicit why the hearer is entitled to draw certain inferences from the speaker's utterances…These protracted trains of thought are hypothetical; they merely serve to unveil the pragmatic logic of a linguistic act. (Geurts & Rubio-Fernández, 2015, p. 449)

Grice includes in this list the contribution from semantic (i.e., conventional meaning) and pragmatic knowledge systems (i.e., the conversational context, general background knowledge, and the auditor's beliefs about the speaker's intentions, etc.)—whereby some further content is inferred by the auditor. His rational model does not specify cognitive load nor the time course of processing, and Grice certainly did not speculate on this. Thus, we have good reason to reject auxiliary hypotheses (i), (ii), and (iv), and basis to significantly qualify (v) in light of Grice's actual view of calculability. Grice wrote that 'the presence of a conversational implicature must be capable of being worked out' and 'for *even* if it can in fact be intuitively grasped, unless the intuition is replaceable by an argument, the implicature will not count as an implicature'.

Grice's use of the emphatic adverb "even" together with the conditional "if" and the adverb "intuitively" suggests the reading that: Some implicatures (and by extension, metaphors) are grasped intuitively (i.e., unreflective). Although some may be intuitively grasped, others are intellectual (i.e., reflective), and thereby require more sustained and thoughtful attention to aid in their understanding.

Thus, if we want to take Grice's remarks seriously, and transpose them onto an empirical model, it seems that we have the following three auxiliary hypotheses:

- (X) The literal meaning of a metaphorical utterance facilitates the comprehension process of the metaphorical meaning;
- (Y) Metaphorical meaning may be grasped unreflectively (i.e., intuitively) or reflectively (intellectually);
- (Z) The meaning of a metaphor must be in principle replaceable by an argument.

On my reading of the calculability criterion, all that (Y) requires is that the speaker and auditor should be willing to justify their understanding of the implicature and be capable (to a certain degree) to provide their justifications by replacing any intuitive graspings by some propositions that reflect the intended meaning (Camp, 2006a, 2008; Sbisà, 2006). Moreover, (Y) leaves open the possibility that some metaphors (for Grice) are more intellectually demanding than others (that are intuitively grasped). In the next section, I attempt to determine the psychological validity of the auxiliary hypotheses of the Gricean model along with the direct access model. It is important to note that I do not include prediction (Z) in my overall programmatic argument. For it is impart a sociological issue pertaining to discourse participants giving and asking for reasons (i.e., practical demands for clarity and justification occurring 'in the wild'). On the other hand, it is a philosophical issue that pertains to issues of approximation and paraphrase (i.e., whether a given metaphor's meaning can be cashed out by literal paraphrase, and if whether this exhausts the metaphorical meaning).

Although an important issue, paraphrasing is an offline process. As we shall see in the next section, the question of processing a metaphor is a time-sensitive issue.[29] Paraphrase by contrast is reflective in nature. It requires sustained processing effort and is influenced by numerous external factors (i.e.,

it runs the risk of 'cognitive penetrability')[30] that breech experimental conditions for testing online processing of metaphors. Psycho- and neurolinguistic research is adept at capturing these time-sensitive online processes. I survey recent empirical data in the next section.

## 5. Recent experimental evidence on metaphor processing

In section 2 I identified previous experimental research in the reading-time paradigm. It suggested that cognitive costs are not exerted during metaphor processing relative to literal control sentences, and that the processor selects the relevant meaning in context. These initial studies support the predictions of the direct access model (I-III).[31] However, self-paced reading studies are not by themselves sufficient in determining the cognitive costs and time course of metaphor processing.[32] Both the role of literal word meaning, and cognitive cost can be measured by more fine-grained methodologies. In this section I restate a survey of the empirical literature on metaphor processing that I have mentioned elsewhere (Author, Year). I include a meta-study conducted by Vartanian (2012).

In psycholinguistics, Cacciari and Glucksberg (1994) have shown that the automaticity of metaphor interpretation largely depends on numerous factors including conventionality, familiarity, aptness, animacy, and the larger communicative context (i.e., whether a context biases a metaphorical reading).

Blasko and Connine (1993) demonstrated that novel metaphors take significantly longer to process than literal and familiar metaphorical stimuli. In addition, Bowdle and Gentner (2001) observed that novel similes are processed significantly faster than novel metaphors. This suggests that it is not the unfamiliar juxtaposition of terms; rather the explicitness of literal sentence meaning is what bears on processing time. Factors such as aptness[33] also play a significant role in processing times. Among unfamiliar metaphors, highly apt meanings are interpreted quickly, although not as quickly as literal meanings while less apt metaphors take significantly longer to process.

In neurolinguistics, electroencephalography (EEG) and functional magnetic resonance imaging (fMRI) are used to trace underlying early processing strategies at both the cognitive and neural level. At the cognitive level, a number of notable event-related potential (ERP) studies conducted in various languages offer compelling evidence that metaphors exert processing costs relative to literal controls. Here are a few: In English: Coulson and van Petten (2002); Lai, Curran, & Menn, (2009); De Grauwe, Swain, Holcomb, Ditman, & Kuperberg (2010); in French Pynte, Besson, Robichon, & Poli (1996); in Hebrew, Arzouan, Goldstein, & Faust (2007); in Italian Resta (2012); in German, Weiland et al, (2014). All studies cited above reported an enhanced N400[34] component for metaphors in comparison to literal controls. Additionally, various metaphor types, such as literary (Resta, 2012) and commonplace—verbal (Lai et al., 2009) and nominal (Pynte et al., 1996)—are associated with an enhanced N400 component.

Pynte et al. (1996) and Lai et al. (2009) manipulated the conventionality of the metaphors and the surrounding context. Results indicated a pronounced N400 for all metaphors. Amplitudinal variations were understood as a function of the examined factors (e.g., unsupportive context increased N400 amplitude). The studies corroborate the hypothesis that an enhanced N400 component is linked to additional processing costs in metaphor comprehension.

Several fMRI studies observe differences in brain-regional recruitment between metaphors and literal controls. For example, Mashal, Faust, Hendler, & Jung-Beeman (2007), Stringaris, Medford, Giampietro, Brammer, & David (2007) and Ahrens, Liu, Lee, Gong, Fang, & Hsu (2007) observed lateral differences in hemispheric activation and regional differences between metaphors and literal sentences. A previous study by Mashal, Faust, & Hendler (2005) observed significant involvement of the right hemisphere—particularly in the posterior superior temporal sulcus (PSTS)[35] in processing non-salient (low-apt) meanings of novel metaphors.

Stringaris and company mentioned above observed that metaphoric sentences, and not literal ones, recruit the left inferior frontal gyrus (LIFG)[36] and the left thalamus.[37] The study conducted by Ahrens et al (2007) observed differences between conventional and anomalous metaphors, and literal controls. Conventional metaphors differed by a slight amount of increased activation in the right inferior frontal temporal gyrus. Anomalous metaphors differed from literal controls by increased bilateral activation of the frontal and temporal gyri.

The activation of the RH in verbal creativity allows us to explain the comprehension of distant and multimodal semantic relationships in metaphorical comparisons. Studies have been conducted on patients with left (LHD) and right hemisphere damage (RHD) (Rinaldi, Marangolo, & Baldassarri, 2004). In two studies, subjects listened to sentences containing metaphoric expressions. Subjects were presented with four pictures that were related either to the metaphoric or literal meaning of the sentences, or to a single word in the sentences. In a visuo-verbal task, patients were asked to point to the picture that they felt represented the meaning of the sentence. RHD patients preferred pictures related to literal meaning but were able to explain verbally the metaphoric meaning of the sentences, suggesting that without the aid of the RH, and the PSTS in particular, preference for metaphorical interpretation can be overridden for LH preference of literal interpretation.

Following Vartanian (2012) hypothesis (X) predicts that metaphors exert greater demands on working memory (WM) and text-comprehension resources than literal items. The author conducted a meta-analysis on the extant literature of metaphor processing in neuroimaging studies—specifically fMRI. The analysis shows that evidence points to the activation of the rostro-lateral prefrontal cortex (RLPC), as well as several other structures that fall within the brain's fronto-parietal system. It reveals three significant clusters of activation: the dorso-lateral prefrontal cortex (DLPFC), temporal pole, and cingulate gyrus. These clusters correspond to Brodmann's area: 9/46; 38; 24/32. Activation of the prefrontal cortex (PFC) extending across the dorsal and ventral (inferior) regions was reported in a number of studies (see Vartanian, 2012, p. 310). Activation of the left cingulate gyrus, as well as the adjacent medial frontal gyrus and the anterior cingulate cortex were observed.

What does this mean? The cingulate gyrus is known to be an important part of the brain's frontal attentional control systems (Carter, Mintun, Nichols, & Cohen, 1997). Activations in the left temporal pole have a well-established role in text comprehension. The DLPFC plays a key role in the brain's WM system. Taken together, these activations support the hypothesis that metaphors exert greater demands on WM and text comprehension resources in contrast to literal conditions. The overall picture is that that metaphors typically involve extra processing effort.

Finally, a recent study looking at literal and fictive motion utterances suggest that processing is anything but automatic. Yang & Shu (2016) found that sentences about fictive motion (e.g., "the highway runs through the house") elicit strong activity in the right parahippocampal gyrus. The same area is elicited in literal motion sentences (e.g., the man goes through the house). The parahippocampal gyrus is a grey matter cortical region that surrounds the hippocampus. Previous studies have found this region to be crucially involved in encoding and recognizing spatial information. These findings suggest that the mechanisms through which we grasp our literal, embodied, real-world motion utterances facilitate the computation of more abstract and figurative ones.

The above studies allow us to draw the following conclusions: first, that lexical meaning facilitates figurative meaning comprehension; that there are observed differences between novel and conventional metaphors, and that and metaphorical meaning exerts greater costs relative to literal controls—even if reaction times are statistically similar across metaphorical and literal conditions. Figure 3 below illustrates how the evidence in this section bears on the direct model and my revised Gricean model.

The Gricean model I have teased out from Grice's rational account of metaphor finds support for the facilitating role played by the literal meaning in the construction of metaphorical meaning. However, nothing I've cited indicates that the procedure is borne out in discrete, serial stages. Grice was unconcerned about this and his rational model makes no claims about it. I return to this point in section 6.

If we think about 'cognitive effort' as the volume of resources in the retrieval of meaning—not simply processing speed—then we find ample support for the idea that metaphor comprehension requires a larger volume of resources by implicating a larger volume of brain regions. Thus, (Y) is supported.[38]

As I mentioned above, (Z) is not a component hypothesis that is tested in the lab when seeking to determine the time-course of metaphor processing. Nevertheless, evidence in its favour can be attested to in our public lives. We often employ metaphors in order to undertake commitments to the contents we assert by them. If pressed, we may justify our utterance by providing some approximation.[39]

| Model | Predictions | Supporting Evidence |
|---|---|---|
| **Direct Access Model** | | |
| (*I*) | Metaphor processing is direct | |
| (*II*) | Metaphor interpretation is automatic | ☑* |
| (*III*) | Metaphor interpretation exerts no extra cognitive cost relative to 'literal' control items. | |
| **Revised Gricean Model** | | |
| (X) | The literal meaning of a metaphorical utterance facilitates the comprehension process of the metaphorical meaning | ☑ |
| (Y) | Metaphorical meaning may be grasped unreflectively (i.e., intuitively) or reflectively (intellectually); | ☑ |
| (Z) | The meaning of a metaphor must be in principle replaceable by an argument | |

**Figure 3.** Predicitions of the direct model and revised Gricean model of metaphor processing and supporting evidence.

## 6. A programmatic sketch

We may have reasonable grounds to vindicate Grice's theory of metaphor from its caricature. Nevertheless, there are several issues regarding metaphor that Grice's account did not anticipate, was silent on, or simply got wrong. On the theoretical side of things, an adequate theory of metaphor must specify the distinctive principles of metaphor interpretation. It must identify the mutually shared patterns of thought on which metaphor rests, and on which the speaker intends her audience to engage to infer metaphorically intended meaning. Grice has not provided a satisfactory answer to this question.

Grice treats metaphor as a species of implicature. As such, he tells us that it must be capable of being 'worked out' by an auditor. Recalling the quote by Grice from the section 1, what he does say about how metaphor is worked out is as follows: "The most likely supposition is that the speaker is attributing to his audience some feature or features in respect of which the audience resembles" (Grice, 1975, p. 53). Admittedly, this is not extremely helpful. As I mentioned in section 2, a number of theorists (e.g., Carston, 2002b; Sperber & Wilson, 2008; Wearing, 2006; Wilson & Carston, 2007) have demonstrated convincingly that metaphors are more intimately connected with conventional word meaning than implicatures, and that they behave differently in conversation than standard conversational implicatures. Additionally, although we credit Grice for attributing cognitive content to metaphorical utterances (see section 1), he failed to acknowledge their non-cognitive import, i.e., affectively-laden qualities (Camp, 2008; Davidson, 1978; Author, Year).

On the empirical side of things, echoing Davidson, Camp writes "rich, poetic metaphors, are important and powerful communicative tools precisely because they can induce in their hearers' new ways of thinking and feeling about the subject under discussion" (2003, p. 39). This is attested to by neurolinguistic evidence (section 4) that demonstrates the activation of neuro-anatomical regions associated not simply with contextual knowledge, but imagining, simulated embodiment, and affective states. I suggested that Grice can be interpreted as respecting a difference between intuitively grasped and intellectually stimulating metaphors. The same can be said of (Carston, 2010; Rubio-Fernández, Cummins, & Tian, 2016; Rubio-Fernández, Wearing, & Carston, 2015). Unlike Carston (2010), Grice cannot be read as attesting to the vast array of imagistic and affectively laden aspects of metaphor interpretation implicated in these studies.

I argued above that Grice's approach only specifies the information that a hearer uses to infer the speaker's intended content and how these inferences are justified. We must keep in mind that there are many 'choice points' in the specification of a given processing model (Chemla & Singh, 2014a). Questions such as 'does the system compute in serial or in parallel?', 'What information does the system have access to at each stage in the computation procedure?', and 'What constitutes a stage in the procedure?' are fundamental to such a research project. Unfortunately, Grice's rational model cannot address these questions. Specifying how the computational mechanism(s) are instantiated and take place in the minds of speakers requires departure from Grice's project. But this shouldn't shock cognitively minded philosophers of language.

Grice's work in "Logic and Conversation" was followed by extensive work on the literal-first serial hypothesis. As we know, this hypothesis (i.e., the strawman) claims that metaphorical meaning computation occurs in a discrete, serial procedure where the metaphorical meaning always happens post-compositionally. If my argument in the last few sections has been sound then this hypothesis, although a contender, does not belong to Grice.[40]

We can specify other hypotheses. In many ways, these alternatives parallel Globalist/Localist debate in pragmatics between Minimalists and Contextualists.[41] One alternative is that top-down pragmatic and bottom up syntactico-semantic comprehension procedures occur in parallel and are penetrable. This would rule out the possibility of the autonomy of the language faculty generating any meaning and structure on its own.[42]

A further alternative: semantic and pragmatic parallel processing occurs. There is an early lexical processing procedure that is informationally encapsulated.[43,44] Accordingly, we could in principle specify the particular contribution of these two systems independently of one another. This alternative pushes us to reconsider how we understand seriality. Thereby opening up the possibility for viewing top-down pragmatic processes and bottom-up syntactico-semantic processes as working cooperatively, despite being structurally distinct in relevant ways.

A final alternative may be that one processing method is selected over the other based on the a given metaphor's 'metaphoricity',[45] its supporting context, and/or the speaker's deliberate intentions to "use a metaphor *as* a metaphor" (Steen, 2015).[46]

At base, a broadly Gricean model must find supporting evidence for hypotheses (X) and (Y). A stronger version should find support for hypotheses (X), (Y), and (Z). However, a comprehensive psychological model of metaphor processing is far from a settled issue. Further empirical specification is needed to determine exactly which mechanisms are involved and how they interact over the time-course of metaphor processing from utterance uptake to (and in the most successful cases) appreciation. The results from the studies mentioned in section 4 provide a good starting point for researchers interested in specifying at least the very early stages of this process.

## 7. Discussion

Pragmatic theories of metaphor begin from the intuition that in speaking metaphorically, a speaker exploits the conventional meanings of their words to undertake a speech act conveying distinct and complex contents. Consider the following example and subsequent analysis from Musolff (2017). The Athenian leader Pericles told the polity to destroy Aegina, calling it

(9) The eyesore of the Piraeus.

Musolff claims that the metaphor shifts attention from issues involving military intervention to aesthetics and health by altering one's representation of Aegina and its people. It downplays the would-be victims, and it presents the attacker as a problem solver as opposed to an aggressor. It conjures up images that are aesthetically displeasing such as disgust and repulsion. The example perfectly highlights the fact that metaphors are an efficient and powerful means of engaging audiences at a cognitive, emotional, and communicative level by presenting a "patterned complex of properties in one chunk" (Glucksberg & Keysar, 1993, p. 421). This pattern of thought has been stressed by numerous theorists when they speak of 'frames', 'schemas', 'stereotypes', 'perceptual simulators', 'perspectives', 'prototypes', 'system of associated commonplaces' and 'characterizations'.

I follow Camp (2003) and Author (Year) in referring to these chunks of properties as 'characterizations'. Elsewhere. Author (Year) has developed a broadly Gricean project with these intuitive structures in mind. The claim is that when a characterization is evoked it conveys a salient subset of properties that can be accessed by an auditor without requiring the discourse participants to be aware of every single element in the structure individually. This structure is made up of a 'chunk' of semantic and conceptual networks, perceptual simulations, affective states, etc.

When we figuratively refer to something or someone as a "jail", "shark", an "eyesore", or "Odysseus" we evoke a subset of salient properties and convey a complex chunk of structured information. In forming a characterization of someone or something, we don't simply assemble a set of properties we believe the thing to possess. Rather, some of those properties will feature more prominently in our minds than others—intuitively or otherwise. They are raised and guided by salience within the discourse context. These salient features can cause the activation of other properties possessed by or associated with the thing or person mentioned in the metaphor. In this way, we are not far from direct access theorists, especially Carston (2010), Ritchie (2009), and Rubio-Fernández et al. (2016, 2015), who insist upon evocation of these complexes in metaphorically used speech.

One important difference between these latter views and a Gricean model is that the Gricean account requires that the "conventional meaning must always be part of an explanation on how interlocutors interpret each other's utterances" (Yavuz, 2018, p. 51). Carston (2002b; 2010) is less willing to admit this aspect in cases involving novel metaphorical utterances; less so for conventional metaphors. Nevertheless, it seems that conventional meaning constitutes an important aspect of metaphor processing in general "even if it rarely emerges as its output" (Camp, 2016, p. 134).

Given the review of recent neurolinguistic data, Grice may have been correct to insist on the importance of literal meaning in metaphor interpretation. However, his theory leaves important questions unanswered. For example, how does the auditor reason from the intended non-literality of an utterance to the conclusion that the speaker intends her utterance in a specifically metaphorical manner as opposed to some other trope? How does an auditor determine what the speaker's intended metaphorical meaning is? That is, what are the distinctive, mutually shared patterns and processes of thought on which metaphorical comprehension relies, and in which the speaker intends her hearer to engage in to recover that metaphorical meaning?

These open questions do not mean Grice is no help at all. Far from it. Grice has shown that pragmatics is intimately concerned with human behaviour. Ultimately, it deals with mental faculties. In this way, Grice paved the way for consideration of pragmatics at the intersection of language and psychology. We may preserve Grice's limited observations concerning metaphor by acknowledging that a psychologized version of the Gricean model need only commit itself to the role that literal language plays in the construction of metaphorical meaning. It does not, however, need to commit itself to the multiple auxiliary hypotheses that have overshadowed Grice's actual, albeit sparse, comments on metaphor. A broadly Gricean research programme can happily coexist with more empirically driven models. Undoubtedly, we require continued and sustained dialogue between researchers interested in developing empirical models and those concerned with rational models to answer important questions about the exact neural mechanisms implicated, the cognitive architecture, and the nature of the inferential processes involved.

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## Footnotes

1. A conversational implicature are carried by the saying of what is said; Grice tells us speakers do not say a metaphor. Metaphors (and various other figurative tropes) are prompted by the speaker's making as if to say. For Grice, saying something entails meaning it. The distinction between 'saying' and 'making as if to say' and the issues that arise from this distinction are not developed in detail in this article. Although see section 2 for a brief discussion.
2. It is unclear exactly from where the psychologized version of Grice's account of metaphor arises. The earliest accounts attributing (in some sense) psychologized claims to Grice's theory of conversation seem to be contextualist criticisms of the borderline Grice drew between what is said and what is implicated. See Saul (2002b) for discussion.
3. I am not raising the strange historical point that examining Grice's views of metaphor more carefully reveals how he anticipated the empirical data that allegedly undermines his views. Rather, I generate auxiliary empirical hypotheses more consistent with his rational model.
4. There have been notable attempts to bring together psychologically oriented pragmatic models, such as Relevance Theorists with models in cognitive linguistics (see, especially Gibbs & Tendahl 2006; Tendahl, 2006; Tendahl & Gibbs, 2008; and Wilson, 2011).

5. Of course, this poses an issue. Some members of the group I refer to as 'direct-access theorists' run under the banner of Relevance Theorists, while others are contextualist in some other, relevant sense, while others belong to either of the two. Yet they share three assumptions what I take to be a defining property of the group: emphasis on the comprehension of metaphor as automatic, direct, and requiring no additional processing in comparison to literal language. However, see Carston (2010), Rubio-Fernández, Cummins, & Tian, (2016) and Rubio-Fernández, Wearing, & Carston (2015) for a more recent and qualified approach to the direct model.
6. This term 'direct access model' is widely used in philosophical and psycholinguistic literature. See, for example Bambini, Bott, & Schumacher (2021), Camp (2006b), Coulson & Matlock (2001), Gibbs (1994), Patalas & de Almeida (2019), Weiland, Bambini, & Schumacher (2014).
7. The Gricean model is often referred to as both the 'indirect access model' the 'standard model' and 'classic model'. I use the term 'Gricean model' to mean any empirical model attributed to Grice's account of metaphor interpretation. By 'indirect access model' I refer to the specific model attributed to Grice by his critics. To avoid confusion, I do not use 'standard model' or 'classic model'.
8. A more general, and perhaps accurate, restatement of the picture is that a speaker conveys something that she does not always strictly speaking say by 'putting it that way'. However, I shall not pursue this line of thought here. I am concerned with auditors' comprehension of metaphors, not with what speakers do in uttering them.
9. I do not attempt to present a classification of metaphors in this article. However, see Camp (2006c), Tirrell (1991), Miller (1993), and White (1996) for some suggestions.
10. Despite their departure from the standard [a is [an] F] structure, it isn't obvious that a Gricean account cannot be extended to meet the particular challenges posed by these examples. Grice, and Gricean-inspired accounts, can appeal to the cognitive effects associated with metaphor as the mechanism by which an auditor determines the metaphorical meaning (Camp, 2006c, p. 161).
11. I owe this wonderful example and explanation to Yavuz (2018, p. 35), although he does not refer to this issue as the 'unidirectionality' problem.
12. Indeed, "the processes that the hearer uses to interpret an utterance might indeed provide evidence about an utterance's meaning-property…but they do not constitute it" (Devitt, 2021, p. 124). Nevertheless, these issues are independently interesting and important.
13. This move finds further support in Saul's (2002b) objections to Relevance Theory's criticisms of 'Grice's project'.
14. See Stern (2006) for an excellent review of the debate.
15. There is of course wide disagreement about the precise nature of these inferences and about the division of labour between conventional content/meaning and rational inference.
16. I focus on Relevance Theorists because they have gained significant traction in contemporary language. They provide a highly plausible, comprehensive, psychologically oriented pragmatics programme. Their views on Grice are widespread.
17. One methodological paradigm used to measure online processing costs is the self-paced reading task. In general, self-paced readings measure the speed (i.e., reaction time) by which a metaphor is read and processed. The outcome of the task is compared to similar, literal sentences. By taking the difference in reading times in both metaphorical and literal conditions, researchers make predictions vis-à-vis the cognitive cost associated with sentence processing across the conditions (e.g., literal and metaphorical items). If the metaphorical conditions take longer to read through than their counterpart, the former is said to be more cognitively costly.
18. Grice's calculability requirement runs as follows: "The presence of a conversational implicature must be capable of being worked out; for even if it can in fact be intuitively grasped, unless the intuition is replaceable by an argument, the implicature (if present at all) will not count as an implicature" (Grice, 1989, p. 31). I am aware of at least one author who explicitly treats calculability as 'replaceability'. Sbisa interprets Grice's calculability condition as "availability of an argument in support of the assignment of the implicature to the speaker's utterance. What the rationality of conversational implicature requires of speaker and hearer is only that they should be willing to justify their understanding of the implicature and capable (to a certain degree) to provide justifications by replacing their intuitive graspings by some more or less complete version of the relevant inferential path" (Sbisà, 2006, p. 244). I find this quite plausible.
19. Or, if you prefer, the Kaplanian content or Russellian proposition. Whatever, my argument is independent of debates on the nature of propositions.
20. see Carston (2012, p. 474-475) above.
21. See Chomsky (1965).
22. Exactly how (psychologically) and whether a person in a given situation processes a metaphorically intended use of speech is entirely irrelevant for Grice—much like how an English speaker mispronouncing the sound /f/ is entirely irrelevant to the status of the phoneme /f/ in English.
23. See footnote 18 above. I take Grice's spelling out of the inferential paths involved in implicature calculation as offering argumentative support to their attribution to utterances.

24. This of course is not to suggest that metaphorical interpretation is non-inferential. Rather, the claim is that the metaphorical meaning is accessed first without relying on the calculation of the literal meaning. In psycholinguistics, some of the earliest studies on metaphor are suggestive of hypothesis (I) above (e.g., Ortony, Schallert, Reynolds, & Antos, 1978). Giora (2003) makes similar claims. In the philosophical literature, Bezuidenhout (2008) argues that in many cases, metaphorical meaning is directly expressed, denying both parallel processing and the literal-first hypotheses. According to Recanati (2004), the phenomenology of metaphorically intended utterance exchanges supports the direct processing model. He claims that for something to count as non-literal in the ordinary sense, the hearer requires input from the literal meaning to generate inferences about the non-literal meaning, and this process should be 'transparent' to him. Metaphors such as "the ATM swallowed my credit card" (Recanati) are 'literal' in the ordinary sense and metaphorical interpretations is a one-stage process because it does not satisfy the transparency condition.
Recently, Carston (2010) has proposed an account of metaphor interpretation that includes two routes or modes of processing. The first is rapid, local, and on-line concept construction (that applies generally to the recovery of word meaning in utterance comprehension). While the other is subject to more global and reflective pragmatic inferential processes. To my knowledge, she is the first among contextualists to posit a dual-route processing model for metaphor where the literal is said to 'linger' throughout the comprehension process. That is to say, literal meaning plays an essential role in the processing of some metaphors. I believe the view of the Gricean model I develop is more compatible with Carston's latest proposal. On the standard relevance theory account, however, given that they reject the norm of literalness, the parser proceeds immediately to the recovery of what the speaker intends to communicate (i.e., the metaphor), this is because the literal meaning is not retrieved first (Carston, 2008b). Metaphor does not require a two-stage computational procedure involving the computation of the 'literal' meaning and a secondary inference to the actual meaning. The Gricean claim I make is stronger than Carston in that it predicts literal meaning is involved in all metaphor interpretation.
25. This assumption originates in dual reference theory (Glucksberg, 2003; Glucksberg & Keysar, 1990, 1993). On the assumption that the vehicle (sometimes referred to as the source) of the metaphor has a literal and a metaphorical reference, the processor need only select the contextually appropriate meaning. In uttering "my lawyer is a bulldozer", the metaphorical meaning (BULLDOZER*) is selected immediately given the context utterance. The theory suggests that the computation of a conventional metaphor is an automated task that involves the processor simply selecting the encoded metaphorical referent.
26. A parallel debate is taking place concerning the status of scalar implicatures. For a full treatment of this debate and what is at stake. See Chemla & Singh (2014a, 2014b) for a wonderful overview and discussion.
27. Saul (2002b) has persuasively argued this point vis-à-vis RTs understanding of Grice's account of CIs in general.
28. This is especially true when it concerns Grice's distinction between what is said and what is implicated. Because Grice's theory of metaphor rests on the distinction he draws between what is said/what is implicated, rejecting the latter brings about by fiat a rejection of the former (see Haugh, 2002 for discussion).
29. Metaphor processing occurs within milliseconds.
30. See Pylyshyn (1984) for a discussion of cognitive penetrability in perceptual systems.
31. As I mentioned above, Carston (2010) argues for the role of literal meaning in extended and novel metaphors. The claim is based on Rubio Fernandez's (2007) study who demonstrated that literal meanings 'linger' throughout processing. Here, pace Relevance Theory, Carston seems to recognize a role for literal meaning, accessible at an early stage of interpretation and which remains active throughout processing. Se footnote 19 above.
32. Additionally, at least one study conducted by Gibbs (1990) is reported to have confounding factors known to influence metaphor processing (see Weiland et al., 2014 for discussion).
33. 'Aptness' is a vague term in metaphor research. Roughly, it means means something like how well a source characterizes a target.
34. The N400 is a negative-going waveform. This is an event related potential linked to meaning comprehension. It has been identified as a stable component in metaphor research. In these studies, it is typically associated with a search in semantic space triggered by the processor identifying an aberrance in comprehension. The presence of an N400 is taken to reflect extra processing effort. The N400 is associated with further subcomponents of lexical processing (i.e., storage, retrieval, integration), which are subserved by distinct neuroanatomical regions.
35. The PSTS is associated with creative tasks such as verbal problem solving, verbal creativity, and multisensory processing (see Jung-Beeman et al., 2004).
36. The LIFG is associated with Brodmann's area 44, 45 (together, Broca's area), and 47. This is commonly known as our language processing network.
37. Not that this study did not find support for laterality found in the Mashal et al (2005).
38. The direct model finds support for the fact that some metaphors (when features such as conventionality, familiarity and aptness are controlled for) are more intuitively grasped than novel and creative metaphors. However, the latter type of metaphor seems to exhibit great cognitive costs in

comparison to literal control items. Thus, (II) is qualified (*).

39. Literary scholars for example are no strangers to the practice of providing quite elaborate justifications for their interpretations of metaphors employed by some of history's most illustrious and celebrated authors such as Homer, Dante, Donne, Shakespeare, etc. Much like the literary critic, we ordinary speakers face various conversational demands that may, for example, ask us to revise or redact our metaphorically intended words, think a bit, and continue with a more suitable, appropriate, or apt response.
40. A complete theory of metaphor requires answering questions about processing and its relation to our knowledge systems. Such a theory undoubtedly departs from Grice given the conjunction of the sets of assumptions concerning processing, i.e., of T1 ∧ T2 ∧ T3 ∧ Tn, where each Ti specifies some set of assumptions about actual implementation (see Bresnan & Kaplan, 1982; Chemla & Singh, 2014a).
41. For an excellent discussion on this debate see Borg (2012, chapter 1; 2016).
42. Some of the first pieces of evidence in support of this hypothesis can be found in Egorova, Shtyrov, & Pulvermüller (2013). Researchers investigated the neural processing of two types of speech acts: Naming and Requesting. Results showed surprisingly early access to pragmatic and social knowledge (~120 ms) after the onset of the critical word. The researchers claim that this is nearly the same time as, or even before, the earliest brain manifestations of semantic word properties could be detected. The team concluded that pragmatic reasoning occurs "in parallel with other types of linguistic processing, and thus supports the near-simultaneous access to different subtypes of psycholinguistic information" ((Egorova et al., 2013, p. 1 – italics mine).
43. The second hypothesis may allow for a 'best of both worlds' solution. For example, suppose that much of what we read and hear is influenced by contextual factors from previous discourse moves to more global expectations and experiences where "pragmatic influence can come from the existence of 'conversation scripts' and stereotypical exchanges, as where an utterance of 'Just these' is heard as expressing that these are the only items I wish to purchase now when uttered at a cash register in a shop (Borg, 2016, p. 514).
44. Support for this hypothesis can be found in the scalar implicature community, but also from folks with interests in presupposition and polarity items. Some of the relevant contributions include Chemla & Bott (2013), Chemla & Singh, (2014a, 2014b), Chierchia, Fox, & Spector (2012), Domaneschi & Di Paola (2018), Huang & Snedeker (2009), Schlenker (2008) and van Tiel & Schaeken (2017).
45. Namely, the quality or power of a metaphor. The concept is intended to evoke the range of metaphors across the dead-conventional-novel spectrum.
46. For more on the deliberate use of metaphor, see Steen (1992, 2008).

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