

BACKGROUND

The project creatively combines two “Research Avenues”, on fundamental problems concerning **metaphor** that have heretofore been studied separately. Avenue 1 starts from but transcends an existing hot debate, on the relationship of metaphor to **metonymy**. Avenue 2 addresses an interaction between metaphor and **propositional attitudes** that has seen only occasional study but that has foundational consequences. The Avenues importantly intersect.

Background to Research Avenue 1 – Metaphor versus Metonymy, and Beyond

This Avenue engages with recent intense debate within Cognitive Linguistics about the vexed and vexing metaphor/metonymy distinction (e.g.: Barcelona 2000; Dirven & Pörings 2002; Haser 2005). Avenue 1 springs from a novel, radical analysis (Barnden, in press: ref. in CV) that is a major step beyond previous analyses, yet springs naturally from them. Prominent researchers have alleged that metaphor differs from metonymy on various grounds, e.g.:

(A) Metaphor involves **similarity** between the two sides (source and target) whereas metonymy involves **"contiguity"**, i.e. perceived connection (as between Bach and his music).

(B) Concepts are sorted into conceptual **compartments** such as "domains", and metaphor crosses between compartments (e.g., war and business ones, for a business-as-war metaphor) while metonymy stays within just one (e.g., a music one, in “listen to Bach”).

(C) Relatedly, the **conceptual disparity** between source and target is greater in metaphor.

(D) The meaning of a metonymic expression itself **incorporates the source/target link**, whereas a metaphor’s meaning throws away such links once they have been traversed.

(E) Metaphor, alone, involves **imaginary (or pretended) identification** of items.

Some researchers have criticized such grounds, but I argue that the problems are even worse than previously thought. E.g., some types of contiguity themselves involve similarity, so (A) breaks down more fundamentally than previously realized. The considerations suggest that it is as fruitless to seek rigorous distinctions between metaphor and metonymy as it is between, say, cars and vans. Metaphor and metonymy may both involve similarity, link-incorporation (see D), etc. The real technical issue is the varying mixes of degrees and types of similarity, contiguity, compartment-crossing, link incorporation, etc. that underlie expressions, whether metaphorical, metonymic or something else. Matters such as (A-E) are "dimensions" not differentiators. In the resulting multidimensional space, metaphor and metonymy occupy messily shaped regions that defy clear description. It is more straightforward, profitable and rigorous to deconstruct metaphor and metonymy by analysing expressions directly in terms of the dimensions (even granting that some of these are themselves conceptually fuzzy).

Fauconnier (2009) similarly suggests that metaphor, metonymy, etc. elude rigorous definition, insight coming rather from studying underlying cognitive operations such as “blending”. But blending theory critically probes the nature of only a few of our dimensions (e.g., E to an extent, but not A or D). Also, Avenue 1 is not limited to a particular processing theory such as blending (or indeed my own, below). Some researchers hold that metaphor and metonymy lie on a single common dimension, but have not leaped beyond this. E.g., Relevance Theory (Sperber & Wilson 2008) casts metaphor as a fuzzy region on a spectrum of loose talk, but does not explicate the dimensional complexities. Also it focusses much more on a metaphorical/hyperbolic/literal cline than on a metaphorical/metonymic one.

Background to Research Avenue 2 – “Mentally Embedded” Metaphor (etc.)

Avenue 2 will scrutinize the largely-neglected issue of metaphor within the scope of [propositional] attitude verbs (mental-state verbs), as in "Mike thinks that terrorism is tunnelling into the bedrock of society." Attitude reports (**PA** reports) and metaphor, separately, present fundamental problems within Philosophy, Linguistics, AI, etc. But attitudinal embedding of metaphor causes additional disruption. Important issues are raised by the

diversity of interpretative possibilities for sentences such as the example just given. The speaker may be claiming that Mike himself conceives of terrorism via a tunnelling metaphor; or the speaker may be using the metaphor to conceptualize the believed situation, without implying that Mike so uses it. There is a rich space of other possibilities. The issue greatly extends considerations arising from the standard, long-standing Philosophical concern with the *opaque/transparent* or *de-dicto/de-re* divide for PA reports (see, e.g., Crimmins 1992).

Despite the deep theoretical (and practical) importance of attitudinally-embedded metaphor, few researchers have addressed it, in any discipline. The most notable exception is Stern (2000), in Philosophy. (See also Camp 2005. Leezenberg 2001 notes the issue's importance.) Cognitive Linguists have intensively studied metaphors about mental states, but not the embedding issue. The neglect is partly due to metaphor and PAs being, separately, major sources of technical anxiety. However, it is imperative to break down the artificial division.

Existing AI Account: Integrating Metaphor Understanding and Belief Reasoning

My previous work has led to a metaphor understanding theory called **ATT-Meta** and its partial implementation in a working computer program (Agerri et al. 2007; Barnden *et al.* (1994); Barnden & Lee (1999); and references in my CV: Barnden 2001—2009; Lee & Barnden 2001). ATT-Meta does not yet address any forms of figurative language other than metaphor. The project, in its theorizing, will draw from ATT-Meta, but will in turn critique and develop ATT-Meta: both theory and program. The program development is not aimed at producing practical software, but at guarding against inconsistencies, gaps and redundancies in our theorizing. **NB:** The project will draw from and critique other accounts, not just ATT-Meta.

According to ATT-Meta, metaphor interpretation can include the application of various commonly-used metaphorical mappings, roughly at the level of generality of Grady's (1997) primary mappings, and/or some general mappings that do not depend on specific conceptual metaphors. Interpretation often involves **open-ended, uncertain inference** in terms of the source scenario, to link the particular source-side concepts used in the utterance to known source-to-target mappings. ATT-Meta also has a **non-metaphorical** branch devoted to **reasoning about agents' beliefs** (Barnden & Lee 1999), allowing an indefinite amount of **nesting** (beliefs about beliefs about ...). ATT-Meta supports metaphorical reasoning **about** beliefs (e.g., via Mind As Physical Space), in response to Cognitive Linguistic research on the importance of metaphor about mental states. ATT-Meta also has parts of a framework for handling the **attitudinal embedding of metaphor**, and **vice versa** (as source-side entities can be thinking agents). The attention to PAs makes ATT-Meta unique among detailed metaphor accounts. But the PA-embedding framework needs much development, and lacks facilities for properly handling the spectrum of interpretations of attitude-embedded metaphor.

ATT-Meta has always cast metaphor as involving **pretence** that the source-side scenario is real (Barnden *et al.* 1994), and is therein distinctive among computational frameworks for metaphor. Also, its belief reasoning systematically integrates **Simulation Theory** (itself based on one type of pretence) with Theory-Theory, and the research has contributed to the debate between these Theories (Barnden 1995, 1998: refs in CV). Thus, ATT-Meta is richly connected to the strongly active **pretence/fictionalist** theme in Philosophy (Egan 2008; Kroon 2004; Nichols 2006; Stern 2000; Walton 1993; Yablo & Gallois 1998), which has been (contentiously) connected to metaphor, PAs and many other issues.

OBJECTIVES and HYPOTHESES FOR TESTING, and their SIGNIFICANCE: Avenue 1

1.1) I will refine the analysis of the existing dimensions in the deconstruction of metaphor and metonymy. Particular, illustrative hypotheses for testing are that **(a) similarity is involved in some further forms of contiguity** (beyond part/whole and representational contiguity, considered in Barnden, in press: ref. In CV); **(b) link-incorporation** (see D above) *is important in relatively creative metaphor in general* (going beyond the cases studied in Barnden, in press); **(c) metonymy exhibits certain types of source/target conceptual disparity** (see C) *more strongly than metaphor does* (e.g., metonymy is less likely than metaphor to link two people), *contra* the standard view about conceptual disparity.

1.1) I will seek to extend the dimensional analysis to cover hyperbole and understatement (incl. litotes). Much metaphor intrinsically has a hyperbolic or an understated nature. Also, Relevance Theorists and others have put hyperbole on a common continuum of phenomena with metaphor. A specific hypothesis for testing: *we should make the notion of similarity more complex than is usual in metaphor research*. In the hyperbolic "His welcome was colder than an ice-storm on Pluto" there is metaphorical similarity but also a crucial difference of degree on the linked features. A notion of "degree-comparative similarity" is needed (see also 1.3(a)).

1.2) I will investigate whether distinctly new dimensions can profitably be added, such as the use of **exemplification** and **stereotypes** (cf. Stern's, 2000, account of metaphor). Some other specific hypotheses are:- (a) **Source/target contrast**, as regards the presence or strength of features, should be added as a dimension. It will help to explicate and relate hyperbole, understatement, and types of metaphor where dissimilarities as well as similarities are in focus. (Contrast could also help bring irony into the account, though I do not plan for this in the project.) (b) **Transfer of information** between source and target should be included as a separate dimension. So far I have left it implicit as an aspect of similarity, in that transfer enhances post-hoc or imposed similarity. Information transfer is important in much metaphor, but, as one specific sub-hypothesis: metonymy can also sometimes involve transfer (notably of evaluative features, as suggested by Warren, 2006, and others). I will also consider adding (c) pretence as a dimension, generalizing (E), and (d) **categorization** as in the class-inclusion theory [Glucksberg 2001] — see also next point.

1.4) I will treat figurative simile more explicitly than heretofore. There is much dispute about whether simile is a type of metaphor or is distinct from metaphor in e.g. its use of similarity or categorization [Glucksberg 2008]. I will critically survey the relevant work to see *whether simile and [other] metaphor can genuinely be divided on grounds of similarity/categorization*.

1.5) I will re-examine some Philosophical claims about metaphor to accommodate the multidimensional fuzziness and deconstruction, and specific technical insights involved. I will seek to clarify some issues, e.g.: (a) in view of (D) above, *how metaphorical interpretations are connected to absurd literal interpretations* (cf. Stern 2006); (b) possible *connections of pretence to metonymy, hyperbole, etc.* See also Additional Comments on Significance below.

1.6) ATT-Meta theory (see above) currently assumes that metaphor has a clear-cut difference from metonymy, namely (E) above. However, Avenue 1 undermines this, and I will tease out the consequences for ATT-Meta theory and develop the ATT-Meta program accordingly, so as to start to **incorporate metonymy**, and also **hyperbole and understatement**.

OBJECTIVES and HYPOTHESES FOR TESTING, and their SIGNIFICANCE: Avenue 2

2.1) I will refine and dispute claims made by (a few) Philosophers about how to treat metaphor in attitudinal contexts and about what this shows about sentence meaning in general. Some illustrative hypotheses: (a) The **range of interpretations of attitudinally embedded metaphor discussed in the literature is simplistic and needs enrichment**. (b) There is *no definite limit on the types and amounts of inference* done in pursuit of a metaphorical meaning (Barnden & Wallington, forthcoming: ref. in CV). In particular, firm restrictions on involvement of implicatures in metaphor meaning cannot be maintained. This engages intimately with the question (salient in the literature) of where metaphor sits with respect to the semantics/pragmatics boundary. Also, (c) some of the liberality of the role of inference **extends beyond meaning of metaphor to meaning in general**.

2.2) Imputed metaphor hypothesis: In interpreting "A thinks that Y" where Y is NOT metaphorically worded, we should sometimes **impute to A a metaphorical view** of what Y expresses, notably when Y's subject matter is one that is often metaphorically understood.

2.3) Metaphorization of inner attitudes: In (2.2), Y might itself be about someone's mental states—mental states are often understood through metaphor. This points to **profound changes in how to treat nested PA reports**, as in "Mike believes that Sally hopes that John

intends ... ", taking Y = "Sally hopes that ...". Hypothesis: Mike may be using a metaphorical conception of hoping. This radical suggestion has not been addressed by others.

2.4) I will explore consequences that (2.1-2.3) have also for non-overtly embedded metaphor. An uttered metaphor should be interpreted relative to the possibly idiosyncratic PAs of the utterer. This complication of implicit embedding of metaphor has not been much studied.

2.5) I will extend the current preliminary provision in ATT-Meta (theory and program) for representations and reasoning needed to understand attitudinally embedded metaphor

OBJECTIVES and HYPOTHESES at the *Intersection of the Avenues*:

Avenue 1 generates a major broadening of Avenue 2, to **(a)** account for *embedded metonymy, hyperbole*, etc. as well as metaphor, and to **(b)** *explicitly address the underlying dimensions themselves, rather than metaphor etc., in analysing embedded expressions.* Conversely, I will explore how Avenue 2 affects Avenue 1:- **(c)** *what counts as, say, contiguity needs refining* to account for idiosyncratic beliefs: the matter cannot be allowed to rest purely on convention/agreement. **(d)** *speculativeness inherent in PA report interpretation should reduce our expectations about the semantic contribution of (embedded) metaphor, metonymy, etc., thereby further weakening metaphor/metonymy differences.*

ADDITIONAL COMMENTS ON SIGNIFICANCE (see also the proposal Summary)

It is significant that Avenue 1's integrative deconstruction, and Avenue 2's enhanced integration of the figurative-language and propositional-attitudes areas, should have arisen from an AI project. AI research in general, by forcing one to define representations and processing methods systematically and in detail, often uncovers simplistic conceptualizations, misguided distinctions, confusions and gaps that can otherwise all too readily be ignored. The proposed project will not only advance ATT-Meta theory itself but will also provide a way in which AI can deeply affect major, active concerns in Linguistics, Philosophy and elsewhere, and can help to break down arbitrary, historically-arising divisions in those areas. The ATT-Meta research, in its intense and distinctive concentration on both figurative language and PAs, is uniquely placed as a prototype vehicle for travelling down the proposed Avenues.

Avenue 1 has some spirit of catharsis in that it releases us from any historically-conditioned pressure to provide a clean metaphor/metonymy differentiation, and abandons any notion that a single dimension is enough for a fundamental analysis of the tropes' relationships.

Avenue 2 has significance across various problem areas in Philosophy, and raises novel issues. The most notable novel issues are the "imputed metaphorization" in objective 2.2, its special case—"metaphorization of inner attitudes" in nested attitude reports—in 2.3, and 2.4's broadening of those issues. As regards 2.3, the attention to nesting in Philosophy, AI, etc. has largely concentrated on the base-level content in the report, not the intervening attitudes, except for explicating the nestedness itself in terms of possible worlds or another formal framework. The "metaphorization" in 2.3 deploys Cognitive Linguistic theory about how real people actually regard mental states, correcting some Philosophical neglect of this matter. This neglect comes from ignoring the possibility that, in nestings, outer agents will often explicate inner agents' attitude-holding using common-sense resources such as metaphor.

The metaphor version of the opacity/transparency issue for PA reports goes beyond the standard concerns in Philosophy, etc., as I begin to explore in Barnden (forthcoming: ref. in CV). In "A believes that Y" for a metaphorically expressed Y, there are concerns such as: whether (in an opaque mode) the understander has to devise any interpretation at all of Y's metaphors; and A's own potential backwardness or open-endedness in explicating the metaphors. The 2.2 issue (metaphor imputation) is itself a major, radical step beyond existing theory about possible interpretations of ordinary, *non*-metaphorical PA reports.

The semantics of metaphor in general remains a conundrum. Hence, embedding raises special problems as to what exactly the metaphor's contribution is. E.g., if inference is

especially heavily involved in metaphor semantics then PA-report semantics needs to take note. This in turn affects inference's role in semantics of non-metaphorical PA reports and indeed of language in general. Relatedly, there is Philosophical dispute as to whether "what is said" by utterances includes metaphorical interpretations (see, e.g., Camp 2006, Wearing 2006) and some of the attendant issues (e.g., relationship of metaphorical meanings to literal interpretations) will be illuminated by the proposed project. Also, Avenue 1 challenges claims made about metaphor and metonymy being placed differently with respect to the semantics/pragmatics boundary and context mechanisms.

Stern (2000, 2006), while being one of the few to address the embedding issue in detail, is himself challenged by Avenue 2. He discusses the interpretation of the metaphorical predication "is the sun" in "Romeo believes that Juliet is the sun." In an opaque interpretation, the content of "is the sun" relies on a different context of "presuppositions" about the sun from what would normally be used: no longer simply the speaker/hearer's own presuppositions, but rather a Romeo-infected context that somehow incorporates presuppositions Romeo is conjectured to have. Now, Stern asserts that metaphor obeys his *Actual Context Constraint* (ACC): that metaphors' contents are always fixed relative to their "actual context" of utterance, even when embedded in (e.g.) attitudinal contexts. He tries (too) hard to save a parallel between metaphor and indexicals/demonstratives, which obey the ACC in the strict sense that the actual context is indeed confined to be the speaker/hearer's. He is thereby led into talking unconvincingly about the Romeo-infected context still being "actual" in being merely an adjusted version of the speaker/hearer's context. Camp (2005), by contrast, states that embedded metaphor violates the ACC, and implies that the Romeo-infected context is not actual. This seems correct, but what is of greater interest in my project are the possible interpretations and possible Romeo-infected contexts themselves, not what "actual" means or any parallel between metaphor and indexicals/demonstratives. But as a side-effect some light will be thrown on these issues.

The project will contribute to the debate between semantic minimalism and contextualism (Cappelen & Lepore 2005; reviews of same in *Mind and Language* 21(1), 2006; Preyer & Peter 2005), as the above Avenue 2 issues are connected to it. ATT-Meta stresses the role of a metaphor's literal meaning and hence to some extent edges towards minimalism (cf. a point in Stern 2006), but in giving context a central guiding role (Barnden 2009: ref. in CV) it is friendly to contextualism. The project may clarify this situation—or show that the minimalism-contextualism distinction is (yet) more complex or less well-defined than currently thought.

The project will contribute to the study of pretence and fictionalism in Philosophy (see Background), in part by developing ATT-Meta's detailed pretence-based methods for metaphor interpretation and belief reasoning, by tightly linking the two, and by addressing issues such as that of one agent representing the pretences engaged in by other agents, and even the question of whether viewing an agent as pretending might itself be a pretence or fictionalist act. Simulative, hence pretence-based, belief reasoning does not itself amount to fictionalism *about believing*, but such fictionalism is allied to metaphorical views of attitudes (cf. 2.3, 2.4 above), as fictionalism may broadly be metaphor-based (Yablo & Gallois 1998).

METHODS and PUBLICATION STRATEGY

The project is one of theoretical exploration, distinctively aided and inspired by the ATT-Meta program development (see ATT-Meta section above). The project also involves seeking real-discourse examples of metaphor, embedding, etc. to guide and inspire theorizing. We will extract examples from the research literature and existing figurative-language compendia, and (when necessary) directly from discourse via electronic keyword/phrase-based searches over the web and established corpora (e.g. British National Corpus, Cobuild). There is no intention here to be statistically representative or to build a statistically representative corpus.

The results will be published in conference proceedings, journals and (on invitation) book chapters, mainly in the disciplines of Linguistics, Philosophy and AI. Journals to be targeted, as appropriate according to developments, include but are not limited to: *Artificial Intelligence; Cognitive Science; Cognitive Linguistics; J. Pragmatics; Pragmatics and Discourse; J. Semantics; Mind and Language; Noûs; Philosophical Studies; Linguistics and Philosophy*.