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Conditionality in individual minds: an argument for a *wholly* pragmatic approach to utterance interpretation

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Abstract: There is a growing body of research which undermines the traditional dual-processing model of utterance interpretation, whereby pragmatic inference is preceded by the context-independent process of linguistic decoding. This body of research suggests that utterance interpretation is a *wholly* pragmatic inferential process. In this paper, I seek to defend a wholly pragmatic approach by investigating the role of the purported process of context-independent decoding and the process of pragmatic inference in determining when a conditional is false. I show that material conditionality, like all kinds of conditionality, lies in pragmatically derived holistic thought, i.e. not in any putative linguistic semantics.

1. Introduction

1.1 Background

Despite the widespread assumption that utterance interpretation proceeds in two stages (context-independent decoding followed by context-dependent pragmatic inferring) and, relatedly, that some sort of linguistic semantics is necessary, the overarching conclusion of contemporary research into meaning (e.g. Sperber and Wilson, 1995; Levinson, 2000) is that, in utterance interpretation, the role of linguistic semantics is much less, and the role of pragmatic inference much greater, than Grice (1989) envisaged. Going even further, it has been repeatedly suggested that linguistic semantics is anyway a problematic and/or redundant notion.

In philosophical quarters, Bilgrami (1992) puts forward two theses: of content unity and content locality. The thesis of content unity states that holistic content is the only kind of mental content. Holistic content provides a pool, or aggregate, of idiolectal resources for *selective* use in the interpretation of behaviour (including linguistic behaviour) of others. Bilgrami's thesis of content locality states that holistic content is selectively constrained at the 'local' level, i.e. in response to context and that it is such locally constrained content which plays a role in the explanation of communicative behaviour. This locality thesis is intended to 'dissolve the very idea of content composed of context-invariant concepts'

(Bilgrami 1992: 12). In linguistic circles, Chomsky (2000: 137) notes that Bilgrami's theses seem 'fruitful directions to pursue'. This seems to substantiate Chomsky's (2000: 132) suggestion that 'it is possible that natural language has only syntax and pragmatics'. From a psychological perspective, Bilgrami's theses are borne out by Hintzman's (1986) empirically grounded multiple-trace theory of memory and information retrieval, whereby context has immediate/direct influence on the process of utterance interpretation. I discuss this theory in more detail in 2.2.

Another philosopher, Fodor (1998, 2008), despite rejecting a holistic account of content, also argues that there is no specifically linguistic semantics[1] and that thought is the only locus of semantic content. This argument is supported by Burton-Roberts (e.g. 2007), who observes that the acquisition of specifically linguistic semantics must be post hoc in that it actually presupposes prior understanding of utterances. This suggests that a specifically linguistic semantics – i.e. a semantics other than that of thought – is not necessary to explain the interpretation of utterances. Burton-Roberts (2013) develops a notion of meaning-as-a-relation, which accounts for how meaning in language is possible without the existence of linguistic semantics. I discuss Burton-Roberts' notion of meaning-as-a-relation in 2.1.

Related to the view that a level of linguistic semantics is redundant is Recanati's (2005) argument that compositionality does not apply on the linguistic/lexical semantic level, but operates to combine pragmatically derived concepts. This is an important argument because it undermines one of the main reasons for positing the existence of specifically linguistic semantic content; if compositionality is to explain productivity, i.e. the infinite expressive power of *language* it should apply at the level of *linguistic*, not pragmatically derived content. Equally, the view that linguistic semantics is not necessary receives some support in psycholinguistic quarters. Gibbs (2002) claims that there is no psycholinguistic evidence for the existence of 'some canonical, non-pragmatic meaning that is automatically analysed at both the word and sentence level'.

1.2 Aims

The claim that a level of specifically linguistic semantics is not necessary has as its collorary the proposal that utterance interpretation is a wholly pragmatic process. In this paper, I pursue the claim that a supra-personal, objective level of encoded linguistic semantics is not necessary in explaining meaning in language and I seek to substantiate the claim that utterance interpretation is a *wholly* pragmatic (i.e. *radically* individualistic and holistic)[2]

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[1] In Fodor's (1998: 9, 2008: 99) words: 'English has no semantics'.

[2] Radical individualism is the assumption that linguistic meaning is neither stable nor shared in any way which would support some notion of supra-personal, objective semantic content of linguistic

inferential process by examining conditionals. The paper consists of two parts. The first (section 2) introduces and deals with the implications of the wholly pragmatic approach and the second (section 3 onwards) seeks to defend and illustrate the wholly pragmatic approach by investigating the relation between conditionals and material implication. As pointed out by an anonymous reviewer, it may be objected that this narrow focus on conditionals does not allow for an adequate defence or illustration of the wholly pragmatic approach in general. So let me explain this choice. The first reason for looking at conditionals is their significance for the distinction between linguistic semantics and pragmatics. Even though the claim that the word *if* semantically encodes material implication has been controversial in philosophy (e.g. Edgington 1995), semantico-pragmatic – i.e. dual-processing (decoding followed by inferring) – accounts of the interpretation of conditionals (e.g. Grice 1989) may be thought of as one of the central achievements of pragmatic theory (e.g. Mauri & van der Auwera 2012). As such, conditionals present themselves as the most obvious first challenge that the wholly pragmatic approach needs to face. My specific focus on indicative conditionals is dictated by the fact that this group alone exhibits a degree of variation which is sufficient to illustrate the problem of pragmatic intrusion, which is central to my argument. The second reason why it is important to look at conditionals is that they are crucial to the question of how language is used to communicate truth-evaluable propositions. As will be argued in section 6, the wholly pragmatic approach offers a compelling perspective on this fundamental issue.

In section 2, I discuss three issues that arise for the wholly pragmatic approach to utterance interpretation:

- the question of what meaning in language is
- the question of how successful communication is possible
- the question of what constitutes the basic premise in the process of utterance interpretation

In section 3, I argue that traditional, dual-processing accounts are not successful in explaning the biconditional interpretation of conditionals. In 4, I discuss an important decoding-inferring asymmetry which arises for dual-processing accounts of conditionals. This has to do with the input of the assumed cognitive processes (decoding or inferring) in the determination of

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expressions. I assume that radical individualism is in the spirit of Chomsky (2000). I take it that radical individualism and holism are two sides of the same coin in the sense that radically individualistic mental contents associated with word use vary across individuals and, in an individual's mind, form a network of inter-connected associations. I will be later arguing that (i) holism is indeed incompatible with any notion of supra-personal, objective linguistic meaning, and (ii) holism is not problematic once meaning is defined in relational terms of Burton-Roberts (2013).

when a conditional is false. This asymmetry indicates that (a) the application of material implication, or lack of it, to conditionals must itself be pragmatically determined and thus (b) even when material implication does model the processing of conditionals, it does so at a level of radically individualistic and thus holistic thought (i.e. not in any putative linguistic semantics). In section 5, I argue that crucial to the study of conditionals is Horton & Gerrig's (2005) extension of a multiple-trace theory of memory to the study of common ground and I discuss its implications for the difference between weak (modelled by material implication) and strong (modelled by material equivalence) interpretations. This is followed by a conclusion.

2.   The three challenges

As mentioned, the rejection of a level of specifically linguistic semantics inevitably poses three questions.

First, there is the issue of meaning. It is generally accepted, and I accept, that linguistic expressions (words and sentences) have meaning. But there is the question of how this meaning comes about. Traditionally, the meaning of linguistic expressions is explained in terms of encoded semantic properties: linguistic expressions have meaning in virtue of possessing, i.e. being partly constituted by, semantic properties. For example, for Saussure and Chomsky (e.g. 2005) words, i.e. linguistic signs, are double-interface objects partly constituted by phonological properties and partly by semantic properties. This tradition then equates word meaning with semantic properties purportedly encoded by words.

A consequence of this assumption is that, in order to arrive at the (speaker-intended) meaning of an *uttered* linguistic expression, we need two kinds of semantics – that of words and, on the assumption that thoughts too have semantics, that of thoughts. Borrowing terminology from Relevance Theory (e.g. Carston 2002), these two kinds of semantics might be called LINGUISTIC SEMANTICS and REAL SEMANTICS, respectively. In utterance interpretation, linguistic semantics is assumed to be deterministically (i.e. necessarily and always) decoded and fed, as a basic premise, to pragmatic processing which yields occasion-specific interpretations of utterances – namely, propositions/thoughts which are communicated by utterances and which are grounded in real semantics. On this view, linguistic semantics – which is equated with the meaning of linguistic expressions – is supposed to aid (i.e. constrain) utterance interpretation insofar as it is at least 'widely' shared among members of a given speech community (e.g. Carston 2002: 19-20). Now, if, as I am arguing, there is no linguistic semantics, i.e. if utterance interpretation is a wholly pragmatic process, what can we say about so-called 'word meaning'? This issue is addressed in 2.1.

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Second, there is the Humpty-Dumpty problem. If there is no linguistic semantics to constrain utterance interpretation, it would seem that words can, in principle, mean anything. If this is so, how do we ever communicate successfully? Third, related to the Humpty-Dumpty problem is the Trigger problem. This concerns the traditional assumption that the decoded linguistic semantics is fed as a basic (triggering) premise to pragmatic processes of utterance interpretation. If there is no linguistic semantics, what triggers pragmatic processing? These issues are addressed in 2.2.

I don't claim in what follows to answer conclusively all the questions which arise for the wholly pragmatic approach, but to point in the direction of possible answers.

2.1 What is linguistic meaning?

Burton-Roberts (e.g. 2013) questions (i) the equation of meaning and semantics (i.e. the equation which follows from the Saussurean double-interface view of a linguistic sign) and (ii) the existence of two kinds of semantics (real plus linguistic). Burton-Roberts argues that *thought is the only locus of semantic properties* (c.f. also Fodor e.g. 2001: 2, 2008: 99). On Burton-Roberts' view, meaning and semantics are distinct but related. Meaning is not a *property* of anything – *meaning is a relation*. In particular, meaning is a semiotic relation for someone between X (for example, an acoustic event) and what has semantic content Y, namely thought and only thought. On this semiotic account, meaning and semantics are related in that *meaning is a relation to semantics*. Linguistic meaning lies in the fact that an acoustic event leads one to have a semantically constituted thought; it is a *relation* within an individual's psychology.

Burton-Roberts' (e.g. 2013; with Poole 2006a, 2006b) Representational Hypothesis (henceforth, RH) develops this semiotic idea.[3] Briefly, in the RH, it is argued that sounds utilised by speakers function as symbolic signs which are used to conventionally represent structured thought. It is the latter, and only the latter, which is the locus of semantic/conceptual content. A symbolic sign used to represent structured thought is referred to as the REPRESENTANS, and the conceptual/semantic content it is used to represent is referred to as the REPRESENTATUM. As with all symbolic signs, linguistic signs depend on (a) communicative, semiotic intention; (b) communicative, semiotic convention; and (c) the recognition of these two. One of the central claims of the RH is that particular languages are internalised Conventional Systems for the Phonetic Representation (CSPRs) of structured thought. As such, CSPRs (i.e. particular languages) mediate between sounds

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[3] Because of the space limit, I can only offer a brief outline of the Representational Hypothesis. The interested reader is directed to the sources cited.

(representans) and structured thought (representatum) – they constitute representational conventions. In the RH, thus, an acoustic event is meaningful *for someone, on a given occasion of use* because it gives rise to a particular semantically/conceptually constituted thought in virtue of being recognised as intentionally used and in virtue of evoking a representational convention.

An important point needs to be emphasised here. In the introduction, I mentioned Recanati's (2005) argument that compositionality operates to combine pragmatically derived concepts. In challenging the issue of compositionality at the linguistic semantic level and, more fundamentally, the utility of the linguistic semantic level as such, Recanati's argument suggests that a very radical underdeterminacy thesis is in order, much more radical than that assumed in Relevance Theory (e.g. Sperber & Wilson, 1995; Carston, 2002). The same radical underdeterminacy thesis is suggested, and pushed to its logical conclusion, by the RH: communicated thoughts are underdetermined by linguistic signs in that linguistic signs do not have semantic properties at all. Neither are linguistic signs meaningful (in the sense of Burton-Roberts) in and of themselves – linguistic signs enter into a meaning relation (to a semantics) and are thus perceived as meaningful *by a particular cogniser*. To reiterate, in the RH, linguistic signs, like all other signs, do not have semantic/conceptual attributes. A linguistic sign (like any other sign) only "has"[4] meaning (in the sense of Burton-Roberts) *for a cogniser* if it leads that cogniser to have a thought, which is *the only* locus of semantic content. For Burton-Roberts, meaning of any sign lies in the relation it has to a thought in a cogniser's mental world.

This radical underdeterminacy thesis is related to the RH's definition of parsing. In the RH (e.g. Burton-Roberts & Poole, 2006a, 2006b), parsing consists in putting something which lacks conceptual/semantic content and syntactic structure (e.g. an acoustic event) into correspondence with something that has conceptual/semantic content and syntactic structure (i.e. thought), on the assumption that the relevant acoustic event was produced with the intention of conventionally representing a structured thought. Evidence for this conception of parsing comes from considering so-called "structural ambiguity" (Burton-Roberts & Poole, 2006b); because anything that has or is a structure can only ever have one structure (e.g. it is impossible for the Eiffel Tower to have two structures at the same time), the possibility of "structural ambiguity" (as in '*He saw the man with a telescope'*) shows that the linguistic sign we are dealing with does not in fact have (is not) a structure. From the perspective of the RH, "structural ambiguity" arises because a CSPR allows one to parse the content-less and

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[4] I am using scare quotes here to emphasise that for Burton-Roberts meaning is not equivalent to the encoding of semantic properties; linguistic signs "have" meaning insofar as they lead cognisers to have a thought.

structure-less representans in two different ways. It is the parse that appears to assign a structure to the string. The intuition that linguistic signs have semantic content and structure as their constitutive properties arises from projecting onto the representans what we assume is the semantic content and structure of its representatum. I will later show how the RH's definition of parsing supports my analysis of conditionals.

My rejection of the notion of linguistic semantics entails a rejection of the notion of meaning-as-a-property and rejection of the double-interface tradition in favour of Burton-Roberts' notion of meaning-as-a-relation, a relation to semantics.

From Burton-Roberts' rejection of the double-interface view of a linguistic sign as not necessary to the modelling of linguistic meaning, it follows that the representational conventions do not mediate between sounds and thoughts in virtue of encoding linguistic semantics. This gives rise to the question of what representational conventions are and how they mediate between sounds and thoughts. In the next section, I will argue that the underlying mechanism for how representational conventions (CSPRs) mediate between sounds and structured thought may be implemented in terms of a multiple-trace theory of memory (e.g. Hintzman 1986, 1988, 2008).

Related to the question of how representational (semiotic) conventions in particular languages mediate between sounds and thoughts is the issue of holism. The wholly pragmatic approach that I advocate maintains, like Fodor (e.g. 2001, 2008), that thought is the only locus of semantics. However, in contrast to Fodor's claims, it maintains that such content is radically individualistic and thus holistic. This raises questions about holism.

Most generally, holism suggests that the meaning[5] assigned to a linguistic expression by a given cogniser is determined by its place in that cogniser's entire belief system (Block, 1998; Pagin, 2006). It depends on and is couched within, an individual's psychology. Consequently, holistic meaning of an expression is dependent on 'all or most other' expressions (Block, 1995) to the effect that two people never assign exactly the same meaning to any word. In the next section, I am going to argue that whereas holism is indeed incompatible with and problematic for the view of meaning as an objective property, it is not problematic once Burton-Roberts' notion of meaning-as-a-relation is adopted.

2.2 *How do speakers communicate successfully?*

Recanati (1998: 630) makes reference to Hintzman's (e.g. 1984, 1986, 1988, 2008)) multiple-trace theory of memory, which predicts that '[w]ords, as expression-types, do not have "meanings", over and above the collection of token-experiences they are associated

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[5] Even though I argue that meaning is a relation (in the sense of Burton-Roberts), I need to talk about 'meaning of/assigned to linguistic expressions' when discussing other theories.

with. The only meaning which words have is that which emerges in context'. Hintzman's model is relevant to theories of utterace interpretation as, from a linguistic perspective, it effectively dispenses with an encoded linguistic semantic (i.e. unitary, summary representation) level. Indeed, it constitutes a suitable psychological model for Bilgrami's theses of content unity and content locality.

The overarching question that Hintzman is concerned with is how abstract (generic) knowledge is related to specific (episodic) experience. Hintzman rejects the view (e.g. Tulving 1984) that abstract, unitary representations of a category are stored in a functionally separate generic memory system. On Hintzman's view, generic knowledge does not have a special status, but can be retrieved on-line from a pool of episodic memory traces.

In multiple-trace theory, every event to which one attends as a communicative event is stored in long term memory as an individual memory trace. Each memory trace, which is an experience-record, is constituted by a configuration of innately specified primitive properties, in terms of which experiences are cognised.[6] Experience-records are similar to the extent that they share primitive properties. In so-called "word meaning acquisition" a relation is established between a mental representation of an acoustic event on the one hand and an aggregate of multiple memory traces on the other. What is acquired is, in effect, the ability to 'label' the primitive properties which constitute memory traces.[7] These traces, however, do not 'resolve' themselves into some general summary representation, or schema. This contrasts with the dual-processing assumption (e.g. Carston, 2002: 364-365) that there exists some process of abstraction from particular concepts associated with a given morpho-phonetic form to the more general linguistic meaning/semantics.[8]

A small digression is in order here. This has to do with the question of how a mental representation of an acoustic event comes to function as a semiotic label. According to Burton-Roberts (2013:12), there are three conditions for an acoustic event to be recognised as a linguistic signifier for a conceptual structure: (a) convention[9], (b) semiotic intention, and

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[6] Hintzman (1986: 412) argues that primitive properties that constitute memory traces are 'not acquired by experience'. I think it is not misguided, therefore, to think of Hintzman's primitive properties as primitive concepts, or what Jackendoff (2002) calls 'conceptual quarks'.

[7] Chomsky (e.g. 2000: 61) has also argued that in language acquisition children 'label' already available concepts, 'with much or all of their intricacy and structure predetermined'.

[8] Carston (2002: 375) makes reference to Hintzman's theory only to reject it in favour of the traditional view on which there is some process of abstraction which yields context-independent general concepts/schemas encoded by words.

[9] Convention governs any relation which is not physically, logically, or in any sense naturally, necessary.

(c) inferentially derived recognition of (a) and (b). These conditions are fundamental to the process by which a mental representation of an acoustic event comes to function for a hearer as a semiotic label in the following way.

If, in a linguistic context, a relation is to be established between a mental representation of a given acoustic event and some conceptual structure, the hearer (H) must *infer* that there is a relation between the acoustic stimulus and the conceptual structure which is being currently entertained in H's mind. More specifically, H must *infer* that the acoustic stimulus produced by the speaker (S) is an ostensive stimulus (Burton-Roberts, 2013: 10), i.e. that it has been produced with the intention of leading H to entertain a particular conceptual structure.

For illustrative purposes, let us imagine that an infant learns to associate a mental representation of an acoustic event [pʰen] with a mental representation of an enclosure in which the infant is often put, complex emotions it gives rise to (i.e. sometimes boredom, sometimes happiness, sometimes fear) etc. For the infant to make these associations the infants' carers must have uttered [pʰen] more than once in the context in which the infant could make that association, and the infant must have recognised the carers' communicative intention. Presumably, this involves the mind-reading capacity (e.g. Sperber and Wilson, 2002).

Now, being able to infer the carers' communicative intention presupposes the infant's ability to discern the similarity of new experiences of uses of [pʰen] with old experiences. Being able to do that means that the infant has recognised (is relying on or is understanding) a communicative convention. *This amounts to having acquired a semiotic label for an aggregate of multiple memory traces*. Once the convention is acquired, similar memory traces will be stored under the same morpho-phonetic label. At this stage in our scenario, a morphophonetic label [pʰen] has multiple memory records associated with it.

Records of experiences in a linguistic context are not stored under a particular morpho-phonetic label based exclusively on the morpho-phonetic properties of the relevant acoustic event. For example, in our scenario there is an infant in whose mind the morpho-phonetic label [pʰen] has been established and is associated with an aggregate of records of experiences with an enclosure (or enclosures). This association, which is bound up with the infant's recognition (even if below the level of consciousness) of communicative intention and convention, will influence the interpretation of new experiences of uses of the morpho-phonetic label [pʰen]. Thus, in the initial stage, if someone is holding a writing instrument in their hand and says to the infant that it is a pen, the infant will interpret the communicative intention in accordance with the already established associations. For example, the infant

may think that the person wants the infant to put the object that the person is holding in their hand in the enclosure.

Presumably, at some point the infant will come to notice (will infer) inconsistency/ contradiction in the context of the uses of [pʰen]; mental representations that certain uses of [pʰen] give rise to will not be congruent (in terms of similarity of primitive properties they are composed by) to those stored under the already established morpho-phonetic label [pʰen]. In simple terms, some utterances of [pʰen] will not be associated with experiences of an enclosure but with experiences of the action of writing or doodling. At some stage, the infant will recognise (infer) that the communicative intention associated with the utterances of [pʰen] differs from context to context. In recognising (inferring) the difference in communicative intention, the infant will recognise the difference in communicative convention and, arguably, a separate aggregate of memory traces will be established – this aggregate will share the morpho-phonetic label [pʰen] with the old one, but will be separate precisely because the memory records are not compatible in terms of the primitive properties they are composed of. It must be emphasised here that the end effect of the process of the acquisition of a semiotic label necessarily involves individualistic and hence divergent aggregates of conceptual structures. This individualism, I believe, is consistent with arguments put forward by Pateman (1987: 91), Bilgrami (1992), Chomsky (2000: 32) and Burton-Roberts (2013: 15-16). Indeed, Burton-Roberts (2013: 18) argues that a set of conventions (i.e. CSPRs) LICENSES the use of sounds as symbolic (representational) signs. In this sense, a word is defined by Burton-Roberts as a symbolic license/rule for the use of sounds as symbolic signs. In the light of the above, I argue that a word as a license/rule/convention can be understood as a multiple-trace aggregate in the sense of Hintzman (1986).

So far I have argued that on Hintzman's account each morpho-phonetic label has aggregates of memory traces associated with it. I will now discuss how these traces are activated in conversation.

Hintzman (1986) distinguishes between PRIMARY MEMORY (PM) and SECONDARY MEMORY (SM). PM is the active representation of the current experience and SM is a pool of largely dormant memory traces. PM and SM interact in the following way. The active configuration of primitive properties in PM – which in a conversational context incorporates features of perceived context, including co-text – constitutes a RETRIEVAL CUE or PROBE. The context-sensitive probe is sent to all traces in SM, which it activates according to their similarity to the probe. PM then receives a single reply or ECHO from SM. The echo that emanates, or resonates, back from SM is a pattern of most strongly activated properties; for Hintzman, the echo constitutes the interpretation of a word on a particular occasion of use. This context-sensitive process of echo retrieval is also known as RESONANCE.

Because the probe, i.e. the record of current experience, is context-dependent (e.g. it incorporates features of perceived context, including co-text), it *necessarily retrieves a fully context-dependent echo*. The process of echo retrieval can retrieve conceptual structures of various degrees of abstractness or specificity, depending on contextual demands. For example, when asked to think of a definition of a word '*table*', or on hearing a generic statement about tables, a generic concept of a table is produced on-line by cumulative activation of all traces and cancelling out the properties that are not shared by the traces. Crucially, the retrieval of such abstract/schematic echo – like *all instances of echo retrieval* – is necessarily context-dependent.

More recently, similar claims have been made by Barsalou (e.g. 2005), who argues that abstractions are dynamically derived temporary online constructions. Indeed, Barsalou (2005: 417) goes on to suggest that abstraction is a skill rather than a structure; he argues that 'what develops permanently is not a fixed summary representation, but a skill for interpreting instances effectively and efficiently'.

It needs to be emphasised that the wholly pragmatic approach I am arguing for is compatible with the existence of frequency based interpretations – sometimes referred to as 'attractors'. However, from the existence of attractors, it does not follow that it is language, rather than thought, which hosts them, or that it is the purported linguistic process of context-independent decoding, rather than the context-sensitive inferential process, which activates them. In fact, deterministic (i.e. necessary, default, context-independent) activation of such attractors would not always be an efficient interpretive strategy.

For example, let us assume that the attractor for the representans "raw" is the concept of not being cooked (c.f. Carston 2002: 27). A wholly pragmatic approach proposed here allows that this attractor would be activated if there are no contextual cues to the contrary, i.e. the activation, or otherwise, of that attractor is context-dependent. This allows us to predict that on hearing the utterance of "This steak is raw" in the context where there is a steak tartare on the plate, the attractor is likely to be activated in the mind of the hearer. However, in contrast to a dual-processing approach, the wholly pragmatic approach also predicts that the attractor is NOT likely to be activated in the context where on the plate, in full sight of the hearer, is an English steak which shows signs of having been fried. In this context, the wholly pragmatic approach allows the activation of the concept of being undercooked without the prior (deterministic, necessary) activation of the concept of not being cooked. The wholly pragmatic approach thus allows for greater interpretive efficiency in virtue of flexibility which is afforded by direct influence of context. In this, I am agreeing with Barsalou (2005: 416), where he argues that various factors may inhibit attractors and facilitate other interpretive

11

strategies. Consequently, the interpretation process remains highly dynamic – because directly context-sensitive – even if there are frequency-based attractors.[10]

Now, the crucial difference between traditional, dual-processing approaches to utterance interpretation and a wholly pragmatic approach concerns the contrast between claims (A) and (B), respectively.

(A) Hearer H converges (to a sufficient degree) on what speaker S communicates because S and H share a linguistic semantics (if only minimal) which is deterministically accessed in utterance interpretation and which therefore constrains utterance interpretation

(B) Hearer H converges (to a sufficient degree) on what speaker S communicates *despite* the non-existence of linguistic semantic content

I argue that a wholly pragmatic model, without positing any notion of linguistic semantics, explains how what S communicates and what H takes her to communicate can converge – in context – to a degree sufficient to co-ordinate the action of communicating. Now, in the introduction, I refered to Bilgrami's (1992) theses of content unity and content locality. There are crucial parallels between Hintzman's model and Bilgrami's account. As discussed, on Hintzman's model, the interpretation of acoustic stimuli is a wholly pragmatic process of retrieving the echo via the matching of the incoming contextual information (i.e. the probe) with multiple traces stored in secondary memory (i.e. trace aggregate level). From Hintzman's (psychological) perspective, Bilgrami's (philosophical) thesis of content locality is implemented in terms of the context-sensitive process of echo retrieval. Hintzman's echo, which can be understood as Bilgrami's local content, is retrieved via the process of matching the incoming stimuli with stored multiple-memory traces – in other words, with Bilgrami's aggregative, or idiolect, level. Hinztman's model thus offers support for the assumption that semantic content is holistic as well as an account of how such holistic content is constrained at the local level.

For example, if we are sitting in a restaurant eating steaks and I am telling you that I really like beef, I am not communicating to you, and you are not taking me to be

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[10] Carston (2002: 332) writes about the word '*raw*' that its 'definitional property' NOT COOKED will be 'rejected' in contexts where the steak is undercooked. Interestingly, Carston explains 'rejected' in two different ways. A rejected concept can be 'inhibited' due to activated contextual assumptions or, if accessed, it can be 'abandoned' due to its inconsistency with contextual assumptions. This claim of Carston's is very much in the spirit of the wholly pragmatic approach.

communicating to you, all the holistic content of my mind. This is because, even though in my holistic mind there are associations between (i) the concept of beef and the concept of a cow grazing on the meadow, (ii) the concept of cow and the concept of milk and (iii) the concept of cow and the concept of cruelty that animals are subjected to in slaughterhouses, not all of these associated concepts are constitutive of the thought I am communicating to you in that particular situation. In this locality, the associations represented in (i), (ii) and (iii) are not selected from the specifications of the aggregative level because they don't resonate strongly enough with the context. In other words, they are not relevant – indeed, not optimally relevant (Sperber & Wilson, 1995) in that context.[11] Because the process of echo retreival is immediately constrained by context, not all memory records (i.e. not all holistic network) play a part in the retrieved echo, only those relevant to particular conversations in particular contexts between particular interlocutors[12]. With Burton-Roberts' definition of meaning-as-a-relation, we can say that whereas mental, i.e. (real) semantic, content is holistic, meaning is locally constrained (in the sense of Bilgrami and Hintzman) to a degree which, all things being equal, allows for successful communication. Effectively, this puts us in a position to embrace holism at the aggregative level and disregard the associated idea that two people never assign exactly the same "meaning" to any word. For those who assume that meaning is a word property it follows from holism that two people never assign exactly the same meaning to any word. However, once meaning is viewed as a relation, it follows that two people *may* assign exactly the same meaning to the use of a word.

Indeed, crucial to successful communication on the wholly pragmatic approach (B) is the assumption about what counts as 'evidence' for the intended interpretation in a communicative act. In dual-processing models (A) the evidential role that context plays in utterance interpretation is secondary in the sense of being post-decoding. This follows from the dual-processing stand on what is acquired in so-called "word meaning" acquisition. Let me explain this.

On the assumption that the product of "word meaning" acquisition is some context-independent concept, all contextually available information must be stripped out in the process of acquisition. Now, if what is acquired is context-independent and if the role of acquisition is to guide future utterance interpretation, it follows – on any dual-processing approach – that the relevance of contextual information (both incoming and that which is stored in memory) is conditional upon (i.e. preceded by and constrained by) the activation of

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[11] Much of what I'm arguing here is consistent with Relevance Theory (Sperber & Wilson, 1995; Carston, 2002). The difference amounts to the existence (as argued in Relevance Theory), or non-existence (as argued here), of linguistic semantics.

[12] This last point is elaborated in section 5.

the context-insensitive product of acquisition. In arguing against the notion of linguistic semantics and the deterministic process of decoding of such content, I am arguing against the claim that contextual information plays a merely post-decoding evidential role.

Rather, on the account advocated here, contextual information (both incoming and stored in memory) has a primary function in utterance interpretation. This is possible because what is acquired is not stripped of contextual information – on the contrary, the product of acquisition is a relation between a morpho-phonetic label and an aggregate of multiple memory traces, which are themselves context-sensitive. On this account, the interpretation of acoustic stimuli is a wholly pragmatic, inferential process of accessing a conceptual structure (or Hintzman's echo) via the matching of the incoming contextual information (Hintzman's probe) with that which is stored in memory traces. The role of the morpho-phonetic label in the process of utterance interpretation is to constrain the process of echo retrieval so that the incoming stimuli are matched not with every and any memory traces but with those already associated with the relevant morpho-phonetic label. Thus, it is the existence of the morpho-phonetic label (and not of some notion of linguistic/lexical concept) that allows for fast and efficient, contextually constrained, processing.

I have been using the term 'wholly pragmatic approach' without addressing the need to re-define the term 'pragmatic'. In dual-processing models (e.g. Sperber and Wilson, 1995) pragmatic inference is a process whereby linguistic semantic content purportedly encoded in an utterance is taken as a basic premise in the context-dependent process of inferring the conlusion (i.e. the intended interpretation). In contrast to this, the wholly pragmatic approach clearly *cannot and does not* define pragmatic inference in relation to any notion of linguistic semantics. On the wholly pragmatic approach, pragmatic inference consists in using a mental representation of an acoustic event (an utterance) in a particular context – i.e. Hintzman's probe – as a premise in an online derivation of the conclusion – i.e. Hintzman's echo. Thus, the difference between the dual-processing notion of pragmatic inference and the wholly pragmatic notion of pragmatic inference amounts to what is taken as a premise.[13]

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[13] An anonymous reviewer points out that it is not clear that resonance is an inferential process. It is true that resonance is an automatic, fast and passive memory process. However, it is inferential insofar as the input (Hintzman's probe) is taken as the premise and the output (Hintzman's echo) as the conclusion in the context-dependent process of deriving what is taken to be a communicated conceptual structure. Indeed, resonance can be viewed as an inference to the most relevant interpretation, in the sense of Sperber & Wilson (1995). Incidentally, Urquiza (2010) suggests that the relevance-based process of lexical concept adjustment – an inferential process in RT – can be implemented in terms of Hintzman's model.

I argue that Hintzman's model provides a solution to the Trigger 'problem': it is Hintzman's probe – i.e. not any supra-personal (public, objective) linguistic semantics – that serves as a basic premise in an online derivation of the conclusion via the inferential process of echo retrieval. Accordingly, utterance interpretation is directly – not merely at a post-decoding stage – constrained by contextual factors. Bilgrami's theses of content unity and content locality, Burton-Roberts' notions of meaning-as-a-relation and semiotic label as well as their implementation in terms of Hinztman's model make assumption (B) plausible.

In the rest of the paper, I defend and illustrate the proposal that utterance interpretation is a wholly pragmatic inferential process by examining the relation between conditionals and material implication.

3.   The problem of conditional perfection (CP)

Geis and Zwicky (1971) drew attention to the human mind's tendency for CONDITIONAL PERFECTION (a.k.a. 'biconditional strengthening'), whereby a sentence of the form *if p, q* invites an inference of the form *if not p, not q* (and thus *q if and only if p*). In other words, sometimes the interpretation of conditionals is predicted by the logic of material implication and sometimes it is 'strengthened' (or 'perfected') and follows the logic of material equivalence.

The interpretation which follows material implication licenses the Modus Ponens $(((p \supset q)$ & p) $\supset$ q) and Modus Tollens $(((p \supset q)$ & ~q) $\supset$ ~p) inferences. I will use the term WEAK to refer to this interpretation of conditionals. The (strengthened, perfected) interpretation, which follows the logic of material equivalence, additionally licenses the inferences of Denying the Antecedent $(((p \supset q)$ & ~p) $\supset$ ~q) and Affirming the Consequent $(((p \supset q)$ & q) $\supset$ p). I will use the term STRONG to refer to this interpretation of conditionals.

Traditionally (e.g. Grice, 1989; Comrie, 1986), conditional perfection (henceforth CP) is analysed in terms of an implicature which arises on the basis of the semantically encoded content[14] and context.

Several suggestions have been put forward as to how and why CP arises. Levinson (e.g. 1983: 146-147) suggests that in the case of CP there seems to be, what he calls, the principle of informativeness at work. This principle would in some circumstances allow

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[14] The problem with CP which I discuss in this section arises regardless of whether the encoded semantics of the word *if* is taken to be truth-functional (e.g. Grice) or not (e.g. van der Auwera). However, the main point of this paper, which is introduced in section 4, is made with respect to truth-functional accounts, in which it is most apparent. Relevant though non-truth-functional accounts are, I do not focus on them here.

speakers to implicate more than what is explicitly communicated. However, Levinson concedes that it still needs to be explained why CP arises in some, but not all, circumstances. Van der Auwera (1997: 262) argues that CP can be explained in terms of a scalar quantity implicature with reference to the following scale: (*if p, q and if r, q and if s, q*) ├ (*if p, q and if r, q*) ├ (*if p, q*). According to van der Auwera, in making the lowest assertion on this scale, one is implicating that the truth of *q* does not follow from any other antecedent (e.g. *r* or *s*) but *p* alone. This account, however, does not provide an answer to Levinson's question: it is still not clear under what circumstances this scalar implicature would arise.

A complicating factor is that the strong interpretation is not restricted to any homogenous group of conditionals. Consider (1) and (2).

(1) If you do something illegal, we'll lock you up.
(2) If you pass the exam, I'll take you to a restaurant.

Comrie (1986: 78) argues that the strong interpretation is natural with prohibitives, of which the threat in (1) is an example. However, as exemplified by (2), this interpretation is also found with promises. Furthermore, some uses of conditionals to communicate general truths (so-called 'universal conditionals') may also involve the strong interpretation, as in (3), whereas others do not, as in (4).

(3) Water heated at an altitude below 600m begins to boil if it reaches 100°C.
(4) If it's a square, it has four sides.

The difference between (3) and (4) is that whereas in (3) the falsity of *q* follows from the falsity of *p* (Denying the Antecedent), which is consistent with the strong interpretation, in (4) nothing about the truth value of *q* follows from the falsity of *p*. This is consistent with the weak, but not strong, interpretation. To complicate things more, (5) (due to Horn 2000: 319) and (6) are examples of conditional injunctions involving the strong interpretation.

(5) If thy right eye offend thee, pluck it out.
(6) If there is no other choice, amputate his leg.

But not all conditional injunctions seem to involve the strong interpretation. Consider (7).

(7) If you press the red button, the conveyor belt will stop.

In (7), unlike in (5) and (6), the speaker does not seem to be communicating that the truth of *q* follows *only* from the truth of *p*.

As a possible solution to the puzzle of how the strong interpretation arises let us consider a post-Gricean proposal within the framework of Relevance Theory (Smith, 1983; Smith and Smith 1988), where the strong interpretation is treated as an explicature, i.e. a pragmatic development of the encoded logical form of the sentence uttered. As in other accounts, the strong interpretation arises by virtue of strengthening the encoded material implication to material equivalence via CP. However, this proposal is much more clearly elaborated in that it explains the strong interpretation against the backcloth of processing effect and effort. Smith and Smith (1988) argue that CP can be explained in terms of Relevance Theory's principle of optimal relevance, which is construed in terms of the interaction between the number of positive cognitive effects and processing effort (Sperber and Wilson, 1995). Thus, in uttering "*if p, q*", the speaker is communicating that ($\sim p \supset \sim q$) for the following reason: if the speaker believed that ($p \supset q$) and that ($\sim p \supset q$), optimal relevance would be achieved just by the utterance of "q". Indeed, if, for example, the speaker of (2) (*If you pass the exam, I'll take you to a restaurant*) intended to take the hearer to the restaurant (*q* is T) regardless of whether the hearer passes the exam or not (*p* is T/F), the speaker would non-optimally increase the hearer's processing effort by uttering "if p". Because the speaker went into the effort of uttering "if p", the hearer assumes, in line with the principle of optimal relevance, that *p* must be relevant to *q*: by uttering "if p", the speaker of (2) communicates, and the hearer takes the speaker to communicate, that *q* if and only if *p*.

A similar argument is put forward by Horn (2000). For Horn, CP is explained in terms of the R principle, a pragmatic principle orientated to reducing the speaker's effort: because the conditional assertion of *if p then q* 'contains extra information' (when compared with the assertion of bare *q*), it follows that *p* must be taken as relevant. According to Horn, what makes a condition relevant is its (communicated) necessity.

However, though initially plausible, Smith and Smith's and Horn's accounts, like that proposed by van der Auwera, also seem to overapply. For example, in (4) (*If it's a square, it has four sides*), just like in (2) (*If you pass the exam, I'll take you to a restaurant*), the speaker has uttered "if p". Accordingly, the utterance of "if p" in (4) should give rise to and be made in aid of giving rise to the (optimally relevant) strong interpretation. However, the knowledge of the existence of rectangles simply rules out the strong interpretation of (4). Thus, even though Smith and Smith's, Horn's and van der Auwera's accounts have a way of explaining why the strong interpretation arises, the problem is that they incorrectly predict it should always arise and thus that the weak interpretation should not be possible.

4. The decoding-inferring asymmetry and the problem of pragmatic intrusion

In dual-processing accounts, the strong interpretation is dependent on assigning material implication (MI) as the encoded – i.e. not inferred – semantics of *if*. However, in this section, I intend to show that the (supposedly encoded) MI-driven weak interpretation itself, as much as the strong interpretation, is derived pragmatically. The discussion focuses on a decoding-inferring asymmetry, which arises for dual-processing accounts, and which concerns the input of the assumed cognitive processes (decoding or inferring) to determining when a conditional is false.

Recall that the weak interpretation is modelled by MI. The logical operator MI '⊃' connects two propositions p (the antecedent) and q (the consequent) such that the truth value of the complex proposition ($p{\supset}q$) is a function of the truth values of the propositions it operates on (p, q). MI is false (F) where the antecedent is true and the consequent false, and true (T) otherwise.

Accordingly, from the claim that MI is the encoded semantics of *if* it follows that the speakers of (1) (*If you do something illegal, we'll lock you up*) and (2) (*If you pass the exam, I'll take you to a restaurant*) can be taken to have spoken falsely only in a situation where the antecedent is T and the consequent F. Consistent with this prediction, in uttering (1) and (2) the speakers are not actually making any (linguistic) semantic undertaking as to what they will do if the antecedent is F, only what they will do if the antecedent is T. On such an account, the strong interpretation (i.e. $\sim{p}{\supset}\sim{q}$) is a matter of pragmatic strengthening. I will argue that there is in fact a problem with this analysis.

Let us start with examples (1) and (2), which are conditional inducements, i.e. statements made to influence hearers' behaviour by telling them about the consequences of their behaviour (Searle, 1971). (2) is used to influence the hearer's behaviour by *promising* that q will be T if p is T, and (1) is used to influence the hearer's behaviour by *threatening* that q will be T if p is T. As observed by Searle (1971), a promise is a pledge to do something *for* someone, not *to* someone, but a threat is a pledge to do something *to* someone, not *for* someone. So promises and threats differ; according to Beller (2002; Beller et al., 2005), what Searle captures by the contrast between *to* and *for* is a motivational contrast which, in turn, gives rise to a difference in deontic commitment.

According to Beller, with promises the hearer is motivated to make p T, whereas with threats the hearer is motivated to make p F. With promises, p is a desired behaviour for which there is a reward (q). With threats, by contrast, p is an undesired behaviour for which there is a punishment (q).

Beller argues that this motivational difference gives rise to the following difference in deontic commitment. With promises, a co-operative hearer is one who makes p T, in which

case a co-operative speaker is obliged to make q T. But if p is F (i.e. if the hearer doesn't co-operate), there is *no obligation* on the promisor to reward the hearer with q, she is only *permitted* to do so – i.e. the speaker is permitted to make q T even if p is F. Threats are different. With threats, a co-operative hearer is one who makes p F, in which case a co-operative speaker is obliged to make q F. Indeed, with threats, if p is F, the speaker is *not permitted* to make q T. This difference, which is attributed to 'implicit social rules', suggests that the strong interpretation is more strongly associated with threats than it is with promises. In Beller's words, it suggests that the deontic interpretation of conditional threats (*if p, then q*) is equivalent to the interpretation of their 'complementary promise' (*if not p, then not q*).

Now, if there really is such a difference in speaker commitment in the case of conditional inducements, not keeping a promise (i.e. what I'll be calling 'promising falsely') should correspond to 'p and not-q' (consistent with MI), whereas not keeping a threat (i.e. what I'll be calling 'falsely threatening') should correspond to 'not-p and q' (not consistent with MI).[15] This corresponds to the intuition that in (2), the promise made by the speaker clearly is broken if the hearer passes the exam (p is T) and the speaker does not take him to a restaurant (q is F). However, if the hearer is taken to the restaurant by the speaker (q is T) even if the hearer has failed the exam (p is F), one can argue that the speaker is over-indulgent, but not that she has not kept the promise to 'q if p'. In (1), however, there is a strong intuition that the speaker has violated the terms of the threat if the hearer does not do anything illegal (p is F) and yet the speaker locks the hearer up (q is T).

In sum, the difference between the promise in (2) and the threat in (1) is this. With the promise the speaker IS NOT taken to have spoken falsely in a situation where p is F and q is T. This is consistent with an MI semantics, but inconsistent with CP. With the threat, by contrast, the speaker IS taken to have spoken falsely in a situation where p is F and q is T. This is *in*consistent with an MI semantics, but consistent with CP. Crucially, this means that, at least in some cases[16], MI predicts when a conditional promise is violated (F) but not when a conditional threat is violated (F).

The significance of this difference between (1) and (2) is the problem it poses for the assumption that the word *if* semantically encodes MI. If we sought to maintain MI as the encoded semantics of *if*, we would have to acknowledge an inelegant asymmetry; the falsity of a conditional is sometimes semantically encoded and thus deterministically decoded in utterance interpretation, and sometimes it is pragmatically inferred. Indeed, this asymmetry is inconsistent with standard, dual-processing accounts of the semantics-and-pragmatics of

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[15] Beller (2005) and Beller et al. (2005, 2009) report on experimental studies which support this hypothesis.

[16] I discuss some exceptions shortly.

conditionals. This is because the distinction between threats and promises is a matter of a holistic and thus pragmatic inference. To see this, consider (8).

   (8) If you do it again, I'll play the guitar.

Is (8) a promise or a threat? We cannot know. It depends entirely on whether the hearer finds listening to the speaker playing the guitar desirable or not. And, crucially, it needs to be established whether the intended interpretation is a promise or a threat (whether it is desirable or not) in order to establish whether the falsity of the conditional is modelled by MI – and thus linguistically semantically en/decoded (according to dual-processing accounts) – or whether it has to be pragmatically inferred. The problem is that such individual propositional attitudes as desires and dreads can only be held at an individualistic and thus holistic level – whether something is a desire or dread, a threat or a promise is not a matter of linguistically encoded semantic content.[17]

    The point I am making here is that if we agree that, at least sometimes, (a) MI predicts when a promise is F, but not when a threat is F, and that (b) the distinction between promises and threats is a pragmatic distinction, then (c) MI models and thus applies at the level of individualistically and holistically (i.e. pragmatically) inferable thought, and thus not at any level of linguistic semantics.

    In fact, this problem for dual-processing accounts arises not only in the case of conditional inducements, but also in the case of conditional injunctions (orders, instructions, recommendations, etc.). Recall (7) (*If you press the red button, the conveyor belt will stop*). On the assumption that the speaker has communicated a belief which she takes to be true (itself a pragmatic inference which involves Gricean maxim of Quality and the assumption that the conveyor belt is in working order), the hearer is licenced to think that the situation in which *p* is T and *q* is F is ruled out. Relatedly, if a situation like that did happen, the hearer would reason that the speaker had lied (had spoken falsely) or held a false conditional belief. This is predicted by MI. In contrast, the hearer of (6) (*If there is no other choice, amputate his leg*), in light of his so-called encyclopaedic knowledge about the grounds for and consequences of leg-amputation, will be licenced to establish the truth value relations between *p* and *q* in a way allowed by material equivalence. As with threats and promises, here the problem for the assumption that the word *if* semantically encodes MI is that the

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[17] An anonymous reviewer points out that the contrast between threats and promises is often lexically explicit, as in '*If you do that, I will spare you/deprive you of my rendering of Hound Dog'*. I am not claiming that the distinction is never lexically explicit, but more often than not, it isn't.

determination of whether MI models the falsity of a conditional or not depends on inferences which go through in a holistic belief system.

Consider also the universal conditionals (3) (*Water heated at an altitude below 600m begins to boil if it reaches 100°C*) and (4) (*If it's a square, it has four sides*). MI guarantees that the conditional in (3) is F when p is T (water reaches 100°C) and q is F (water doesn't begin to boil). This is a correct prediction. But MI also guarantees that (3) should be T if p is F (water doesn't reach 100°C) and q T (water begins to boil). This is an incorrect prediction for anyone who knows that it is impossible for water heated at an altitude below 600m to start boiling before it reaches 100°C. In contrast, the conditional in (4) is F when p is T (it is a square) and q F (it doesn't have four sides), and T otherwise. The truth value of (4), but not of (3), can be predicted by MI. Again, the difference between (3) and (4) and thus the determination of whether MI predicts the falsity of a conditional or not is established at the holistic level of belief – it depends on a cogniser's (so-called encyclopaedic) knowledge that there is no other boiling point for water heated at an altitude below 600m than 100°C and that, apart from squares, there are other geometric figures with four sides.

It may objected that the asymmetry I have been discussing here is actually compatible with the assumption that what we are dealing with is a pragmatic process of CP: the strengthening of encoded MI to equivalence. But this argument, I argue, is incorrect. Just as it is pragmatically established that MI does not model the falsity of (1), (3), (6) or of the threat interpretation of (8), so it is pragmatically established that MI models the falsity of (2), (4), (7) and of the promise interpretation of (8). This is because the (supposedly encoded) MI-driven weak interpretation is as much a matter of pragmatic inference as the equivalence-driven strong interpretation.

Holistic inference is also evident in conditionals which are used to communicate the falsity of the antecedent. The example below is taken from Akatsuka (1986).

(9) *Pope to a telephone operator in a small Swiss village*: I'm the Pope.
   Operator: If you're the Pope, I'm the Empress of China.

In the interpretation of (9), we would normally take the operator to be communicating her disbelief that the hearer is the Pope. This interpretation arises via an MI-licensed inference of Modus Tollens: based on the assumption that the speaker has spoken truly and the patent falsity of the consequent, the speaker is inviting the hearer to infer the (communicated) falsity of the antecedent. However, even though it is plausible to argue that the interpretation of (9) is modelled by MI, MI can only apply at the level of holistic thought. Here is why. The

operator in (9) communicates her disbelief that the hearer is the Pope by inviting him to perform Modus Tollens. The operator can assume that the hearer (i.e. the Pope) will be able to perform Modus Tollens only because, given that the hearer (i.e. the Pope) assumes that at the other end of the line is an operator in Switzerland, the hearer (i.e. the Pope) will be able to pragmatically infer the blatant falsity of the consequent. Crucially, the hearer (i.e. the Pope) will be able to infer from the falsity of 'I'm the Empress of China' to the communicated falsity of 'you're the Pope' *even though the hearer (i.e. the Pope) knows that 'you're the Pope' is in fact true*. The Pope will be able to infer that MI models the relation between 'I'm the Empress of China' and 'you're the Pope' in the operator's mind even though it does not model the relation between these two propositions/thoughts in his mind. This shows that if MI models the relation between 'I'm the Empress of China' and 'you're the Pope', it does so not as a matter of logical necessity, but as a matter of an individual's inferred beliefs.

The aim of this section has been to argue that MI does not model the semantics of conditionals. The discussed decoding-inferring asymmetry in determining when a conditional is false highlights the problem of pragmatic intrusion into the assumed truth-functional semantics of the word *if*. If I am right in arguing that the MI-driven interpretation, as much as the equivalence-driven interpretation, is derived pragmatically, then MI does not apply at any level of linguistic semantics, but at the level of individualistic, pragmatically inferred thought. In short, I am arguing that it is thoughts and not sentences that are the locus of conditionality.

Indeed, the interpretation of so-called relevance uses lends support to this argument. Consider (10).

(10) If you're thirsty, there's beer in the fridge.

Following DeRose & Grandy (1999), it seems plausible to assume that in examples like (10) the conversational relevance of q (or, perhaps, of the utterance of "q") is 'contingent' – or shall we say *conditional* – upon the truth of the proposition communicated in p. Conditionality here operates on the relevance of q (or the utterance of "q") in the context, not on q. Even though in cases like this, we are dealing with conditionality, it is clear that this conditionality must lie in thought. This is because thought is where relevance is established.

The point I am making here with respect to the locus of conditionality concerns the fundamental question about the locus of semantic properties. In this section, I showed that the weak interpretation, as much as the strong interpretation, is derived pragmatically. This is to say that MI (and conditionality generally) can only ever apply at the level of holistic, pragmatically inferred thoughts – i.e. not in any putative linguistic semantic level. Now,

relevance theorists (e.g. Sperber and Wilson, 1995; Carston, 2002) have long argued that thought is the only locus of real (i.e. truth-theoretic) semantic properties. However, Relevance Theory posits two kinds of semantics: linguistic semantics and real semantics. Thus, even though in Relevance Theory thought is the only locus of real semantic content, it is not the only locus of semantic content. What I have argued here strengthens Burton-Roberts' (2007, 2013) claim (see also Fodor, 2001: 2, 2008: 99;) that thought is the *only* locus of semantic content. This account can, in my opinion, be treated as an extension of Relevance Theory's stance on the locus of (real) semantic properties.

In the next section, I show how the interpretation of conditional utterances – by which I mean representations produced in aid of representing (in the sense of Burton-Roberts) conditional thoughts – can be explained in terms of a wholly pragmatic inferential process.

5.   Common ground as a direct constraint on interpretation

I argue that crucial to the interpretation of conditional utterances is Horton and Gerrig's (2005) extension of a multiple-trace theory of memory (e.g. Hintzman 1986) to the study of common ground.

Briefly, Horton and Gerrig (2005) and Horton (2008) argue that common ground is not a category of specialised mental representations, but 'an emergent property of ordinary memory processes acting on ordinary memory representations'. For them, common ground assessment, or what they refer to as COMMONALITY ASSESSMENT, concerns cue-dependent retrieval – via the process of resonance (e.g. Hintzman, 1986) – of episodic memory traces which store information associated with a particular interlocutor. In this model, conversational interlocutors serve as highly salient cues for the retrieval of multiple memory traces which are involved in the assumption of common ground. Such cue-based retrieval of interlocutor-associated information accounts for the readiness in memory of records of interlocutor-related experiences and their availability to processes of speech production and comprehension. Indeed, Horton and Gerrig's (2005) and Horton's (2008) claim is that interlocutor-specific information is one of many cues which are simultaneously integrated during language processing.[18] The retrieval of interlocutor-specific information allows interlocutors to assume communal or personal common ground (c.f. Clark, 1994). Construed in terms of ordinary memory processes, interlocutor-specific information may place

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[18] See also Horton & Slaten (2012) and Gerrig, Horton & Stent (2011) for corpus-based and experimental studies which support this hypothesis.

immediate – i.e. direct – constraints on the processes of utterance production and comprehension.[19]

If we assume that interlocutor-specific information may place an immediate/direct constraint on utterance interpretation, then it is plausible to assume that interlocutor-specific information may be involved in Hintzman's probe, which, as argued in section 2.2, serves a basic premise in the inferential processes of utterance interpretation. This has implications for the interpretation of conditional utterances, a point I turn to now.

A particular point I develop here is that included in the contextual assumptions which directly constrain the interpretation of conditional utterances are the interlocutors' assumptions about each other's holistic states of mind. It is this, I argue, that helps identify conditions under which weak versus strong interpretations arise.

So far, I have been assuming that MI predicts the truth value combination which gives rise to the assumption that the promise in (2) (*If you pass the exam, I'll take you to a restaurant*) is broken (what I have been calling 'promising falsely', i.e. the weak interpretation). However, given the right context, even this example may receive the strong interpretation.

Let us imagine a scenario – scenario (i) – in which the speaker of (2) is an over-indulgent grandmother of the hearer and is assumed to be so by the hearer. In scenario (i), the hearer stores memory records of grandma promising q if p, where p corresponds to a successfully completed task (by the hearer or other member of his family) and q is a promised treat for p. Crucially, the hearer stores memory records of non-completion of a given task followed by the occurrence of treat. Put simply, due to grandma's tendency for over-indulgence, the hearer remembers occasions on which q was T even though p was F. In this scenario, the utterance of (2) and the fact that it is uttered by this particular interlocutor function as cues to activate records of relevant past experiences. Thus, in scenario (i), the product of personal commonality assessment is likely to dictate to the hearer that he can make no assumptions as to what will happen if he fails the exam. In other words, the hearer is likely to interpret the

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[19] This, of course, is subject to normal limitations such as recency, frequency, interference, etc. Horton & Gerrig (2005: 10) argue that from a pool of stored information only those traces will be retrieved which are most consistently associated with the cue. Furthermore, only those traces will become relevant to the processes of language production and comprehension which are retrieved within an adequate time frame. Given such constraints, interlocutor-specific information which is too weak or too slow will not have an immediate impact on the language production and comprehension processes. As such, common ground assumptions do not 'a priori, have any particularly greater or lesser privilege than any other constraint' (Horton & Gerrig, 2005: 27).

indulgent grandma as communicating that from the truth of p the truth of q will follow, and no more than that. On this interpretation of (2), the grandmother is not taken to have communicated anything about what she will do if the hearer fails the exam and thus it would not be surprising for the hearer to ask '*What if I don't pass the exam?*'. The justice (relevance, appropriateness) of this question is predicted by MI, but only on the assumption of granny's indulgence.

Indeed, if the indulgent grandma wanted to communicate and be taken to communicate that q if and only if p, the product of commonality assessment would most probably dictate to her that the form in (2) with an unmarked stress would not be sufficient to communicate that q if and only if p to this particular interlocutor. Thus, if the indulgent grandma wanted to communicate to her grandson that q if and only if p, she would be likely to put stress on *if*. Putting the stress on *if* would have the (intended) effect of making the shared background assumptions – that is, the assumptions about the grandma's tendency for over-indulgence – irrelevant to, or inconsistent with, this particular conversation. Thus, it is the utterance of (2) (with an unmarked stress), combined with the commonality assessment of a particular interlocutor (the hearer's grandma who is known to the hearer to be over-indulgent) which give rise to the weak interpretation.

But it is equally plausible to imagine a scenario – scenario (ii) – in which the speaker of (2) is the very strict father of the hearer. As in (i), so here, the utterance of (2) combined with the fact that it is uttered by the strict father of the hearer function as cues to activate records of relevant past experiences. In (ii), the hearer stores memory records of the father promising q (a treat) if p (an undertaking is successful) and also of consistent associations between unsuccessful undertakings and ensuing lack of treat. Given such personal commonality assessment, in scenario (ii), the hearer of (2) is likely to interpret his father as communicating that q if and only if p. Indeed, given the shared assumptions about the father's strictness, the hearer would be unlikely to ask '*What if I don't pass the exam?*'.

It is interesting to note that common ground assumptions actually block the weak interpretation of some conditional promises. Consider (11) uttered by a car manufacturer to a car designer.

(11) If the car you've designed passes the safety test, we'll start selling it.

In (11), the hearer is unlikely to reason that the speaker has made no commitment as to what she will do in a situation where the car has failed the safety test. This is because the hearer knows that the speaker is legally obliged to refrain from selling the car in a situation where p is F and assumes that the speaker is an honest person. Such common ground assumptions dictate the strong interpretation.

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Similarly for threats, the utterance of (1) (*If you do something illegal, we'll lock you up*) and the assumption that it is uttered by a police officer in a democratic state serve as cues to activate relevant assumptions about about legal aspects of social order. Such common ground assessment is likely to give rise to the strong interpretation. However, in the right circumstances, conditional threats may in fact receive the weak interpretation. Consider a scenario in which Anna and Mary are at the party. Anna is very irritated because she has just been verbally offended by Mark. She says to Mark:

(12)   If you talk to me like that again, I'll tell you what I really think about you.

Anna has just threatened that if p is T then q will be T, but clearly has made no undertaking that if not p then not q. Indeed, even though it is plausible to interpret (12) as a threat, it is far from clear that Anna could be judged to have spoken falsely if p is F and q T – if, for example, Mark offends someone else at the party or Anna gets sufficiently drunk or irritated Mark actually challenges her to q. In fact, given that Anna has been verbally offended by Mark, she is surely permitted to make q T in the absence of p, i.e. in the absence of further offence by Mark. The difference between the threat in (1) and the one in (12) is brought about by the interlocutors' appreciation of the difference in the nature and social context of the threat, which involves complex assumptions about one's interlocutors (e.g. whether they have relevant executive power, whether the present situation is constrained by law, etc.). Whereas such pragmatic considerations constrain the interpretation of (1) to *if and only if*, there is nothing in the (cognitive) context of (12) to impose such a constraint.

Now, if Horton & Gerrig are right in arguing that interlocutor-specific information may place direct constraints on utterance interpretation, the strong interpretation can be retrieved without the need to first decode the MI semantics in the strict father scenario of (2), in (1), (11) and other relevant contexts. Indeed, it seems to me that this upshot of acknowledging direct influence of context on utterance interpretation is more consistent with the claim that our minds have a tendency to interpret conditional utterances as biconditionals (e.g. Geis and Zwicky 1971) than is the traditional assumption of deterministic MI semantics.

As discussed earlier, conditional promises, threats, injunctions and universal conditionals can all receive a weak or strong interpretation.[20] Accordingly, (4) (*If it's a square, it has four*

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[20] Arguably, the product of personal commonality assessment influences the interpretation of conditional inducements more strongly than it does the interpretation of universal conditionals. As discussed earlier, whether a universal conditional receives, and is indented to receive, a weak or strong interpretation depends on the cogniser's so-called 'encyclopaedic' knowledge. It seems that

sides) is modelled by MI – it licenses Modus Ponens (MP) and Modus Tollens (MT), but not Denying the Antecedent (DA) or Affirming the Consequent (AC). However, the fact that (4) is modelled by MI (and that we reject the validity of DA and AC) relies on a holistic inference – in order to know what inferences can and cannot be performed in the case of (4), one needs to know that rectangles also have four sides. It is in virtue of this premise, which, if held, is held in the holistic belief system, that the hearer of (4) can establish that the truth of p is relevant to the truth of q so that the truth of q follows from the truth of p, but not vice versa, and that the falsity of q is relevant to the falsity of p so that the falsity of p follows from the falsity of q, but not vice versa. Consider also (13).

(13) I can't exactly remember the shape of the figure that John drew, but if it wasn't a square, it was certainly a triangle.

MI, considered as the linguistic semantics of the word *if*, falsely predicts that if it actually was a square (antecedent is F), then we can make no inference – in the light of (13) – as to whether the figure was a triangle or not. But what the speaker of (13) is committing herself to is that from the falsity of p in (13), the falsity of q follows. This is modelled by equivalence (DA). As above, in order to know what inferences can and cannot be performed in the case of (13), one needs to know that nothing can be both a square and triangle. It is in virtue of this premise, which is held at a holistic level of belief – and in the light of (13), which restricts the options (either a triangle or a square) – that the hearer can establish that in the case of (13): the truth of p is relevant to the truth of q so that the truth of q follows from the truth of p, and vice versa, and that the falsity of q is relevant to the falsity of p so that the falsity of p follows from the falsity of q, and vice versa. Thus, as in the case in (4), the inferential process triggered by the utterance of (13), takes place in a holistic domain of thought.

Now, it is uncontroversial that the sort of inferences we make, and are assumed to be able to make, depends, in each and every particular case, on particular holistic states of the interlocutors' individual minds. However, to assume, as is traditionally assumed, that the holistic (cognitive) contextual conditions influence the process of utterance interpretation at the post-decoding stage gives rise to what has been called the problem of pragmatic

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because conditional inducements are used to influence the hearer's behaviour, the information about interlocutors is highly salient in this context and thus the personal commonality assessment is crucially involved in message formation and interpretation. However, what universal conditionals, conditional inducements and injunctions have in common is that their interpretation goes through a holistic belief system.

intrusion (section 4). In contrast to this, the wholly pragmatic approach is able to explain how the holistic (cognitive) contextual conditions determine the strong and the weak interpretations of conditional utterances without giving rise to any problem of "pragmatic intrusion". Since the wholly pragmatic approach acknowledges immediate/direct influence of context on utterance interpretation, the notion of "pragmatic intrusion" simply becomes incoherent. The collorary is that even though objectively messy, i.e. not governed by any necessary principle, the weak and strong interpretations of conditional utterances ARE subjectively (i.e. individualistically and holistically) predictable.

The last point I want to make in this section concerns the compatibility of the wholly pragmatic approach with the existence of dynamic attractors (section 2.2). As is well documented in psychological literature, there are individual differences in the interpretation of conditionals. For example, Politzer (1981) discusses differences between Arts students, whose choices in a truth-table task are more often characteristic of the strong interpretation, and Science students, whose choices are more often characteristic of the weak interpretation. Based on such findings, one might tentatively suggest that the Arts students are more likely to have (p≡q) as the attractor for the representans "if" and Science students are more likely to have (p⊃q) as the attractor.[21] However, it is consistent with individual holism that to assert this with any degree of confidence would require a series of large scale experiments involving specific populations, within-subject tests and a wide range of conditional uses.[22] In the meantime, I believe that the notion of dynamic attractors allows to reconcile the radical individualism which follows from the wholly pragmatic approach with some psychologically plausible way of making useful generalisations.

6. Concluding remarks

This paper has shown that the application of MI (or lack of it) to conditional utterances has to be pragmatically determined and (b) argued that because of (a), if MI applies, it does so at the level of individualistic and thus holistic thought. If I am right in so arguing and, if the notion of a conditional sentence (i.e. an abstract *linguistic* entity) is dependent on it encoding MI, then it follows that there are no conditional (i.e. (*p⊃q*)) sentences. From the perspective of the RH's definition of parsing (section 2.1), interpreting conditional utterances – i.e. representations produced in aid of representing conditional thoughts – consists in putting these representations, via the process of pragmatic inference, into correspondence with a particular conditional thought, which is the only locus of semantic and structural properties.

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[21] Note that none of these seems to be involved in the interpretation of so called relevance uses. But see Noh (2000).

[22] See Politzer (1981) for a discussion of within-subject variation in the interpretation of conditionals.

From this perspective, the meaning of a given conditional utterance (i.e. what might be seen to make it a conditional utterance) consists in the relation this utterance bears to the semantic content of a thought which is arrived at wholly through pragmatic inference.

There are several linguistic and philosophical questions to be answered with regards to the wholly pragmatic approach. I can merely signpost some of them here.

One important issue concerns the philosophical debate about whether we can and should reconcile subjective inference with truth-based inference. I would like to suggest that we should (see also Carston, 2002: 257). This suggestion, however, is far from being uncontroversial. Like subjective conditional probability theories (see e.g. Edgington, 1995, 2008; Oaksford and Chater, 2003), the wholly pragmatic approach rejects the claim that the word *if* encodes MI. That is, both approaches agree that different cognisers accept different inferences depending on their degree of belief in *q* given *p*-in-relation-to-the-cogniser's-database (i.e. the cognitive context). However, subjective conditional probability theories go further in arguing that, because the word *if* does not encode MI, it is not used to communicate truth-evaluable propositions. For example, Edgington's (1995: 307-308) scepticism about the assumption that subjective conditional probability theories are compatible with truth-based theories of sentence semantics is evident in her criticism of Stalnaker's (1975) proposal that the truth of a conditional is context dependent. Edgington (ibid.) writes: 'I don't wish to deny that there is such a thing as context dependence. But to appeal to it to such an extent might be thought to vitiate the point of the appellation "true"', and she doubts that 'such "truth conditions" deserve their name'.

There are two points to be made about this scepticism. The first concerns the problem of the disparity between disjunctive belief and the logic of inclusive disjunction. This disparity seems to parallel the disparity between conditional beliefs and the logic of MI (discussed by Edgington, 1995, 2008). Consider (14).

(14) Tomorrow I will take the 9am flight to Paris or the 9am flight to New York.

The disparity between the exclusive disjunction interpretation of examples like (14) and the purportedly encoded inclusive disjunction could be approached in conversational terms of Grice (1989), Levinson (2000) and Chevallier et al. (2008). However, it seems that (parallel to the arguments made by Edgington (1995, 2008) for *if*) there is a problem with the disparity between the disjunctive *belief* and the logic of inclusive disjunction. A person C can rationally but inconsistently with the logic of inclusive disjunction believe that the next day C will take the 9am flight to Paris or the 9am flight to New York and not both. This disparity cannot be

explained in conversational terms simply because it takes place at the level of belief and is independent of any conversation (and thus of conversational principles).

In this situation, one can either assume that *or* is not used to express truth-evaluable propositions (in parallel with Edgington's arguments for conditionals) or reconcile truth-based inference with context-dependent and thus subjective inference (as proposed here). If one assumes that *if* and *or* are not used to communicate truth-evaluable propositions/thoughts, one has *no way of explaining how* the interpretation of conditionals may follow the logic of MI and the interpretation of disjunctions may follow the logic of inclusive disjunction. The other choice is to reconcile truth-based inference with context-dependent and thus subjective inference, as proposed here. The wholly pragmatic approach offers a way of approaching the question of how it is possible that language in general – and the words *if* and *or* in particular – is used to communicate truth-evaluable propositions/thoughts *without encoding truth properties*. From the wholly pragmatic perspective, the question should be approached not by making a classical assumption that truth properties generally and truth operators specifically are encoded in language, but that they are pragmatically inferred. In my opinion, this conclusion follows if Relevance Theory's stance on the locus of (real) semantic properties is taken to its conclusion, as it is in Burton-Roberts' Representational Hypothesis.

The final point I want to make relates to objectivity of logical truth and concerns the relation between MI, thought and (some notion of) the Language of Thought (LOT). I have argued here that holistic thought, and not linguistic expressions, is the locus of MI. From this it follows, I argued, that the application of MI has to be pragmatically determined. However, the pragmatically determined (i.e. holistic) *application* of MI does not at all indicate that MI itself is not subject to a realist-naturalistic inquiry, i.e. enquiry in terms of natural and necessary principles. Indeed, assuming that:

(a) MI is part of the logical, real, natural system
(b) The language module (on the assumption that it exists), or any expression generated by it, cannot be the locus of MI, as argued in this paper
(c) LOT is subject to a realist-naturalistic inquiry[23]

It follows that (d) MI is licensed/allowed by (most plausibly the compositional component of) LOT. Thus, even though the question of when MI applies is pragmatically determined, the fact that it does (and can) apply is naturalistically determined.

I argue that the wholly pragmatic approach offers a way of resolving the long-standing and – thus far – unresolved debate between theorists who argue for an MI analysis of conditionals (the pro-MI camp, e.g. Grice) and those who argue against it (the anti-MI

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[23] See Burton-Roberts (2011).

camp, e.g. Edgington). The pro-MI intuition that MI has something to do with conditionals and the anti-MI argument that the word *if* does not encode MI are actually compatible – at the heart of the disagreement lies the very problematic assumption that there is/should be such a thing as encoded linguistic semantics. The wholly pragmatic approach agrees that the word *if* does not encode MI; however, in contrast to anti-MI analyses, it can explain why and how not all conditionals diverge from MI.

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