

# ***PRONOUNS, PROCEDURES AND RELEVANCE THEORY***

PAUL HEDLEY

## **Abstract**

The aim of this paper is twofold: firstly to look at what pronouns mean, the information they encode and the effect that that information has, and secondly to sketch an account of how hearers use that encoded meaning to interpret pronouns in utterance contexts. I shall be adopting the framework of Relevance Theory (Sperber & Wilson 1986/95) and showing what can be gained from its cognitive perspective, and will set out some of the arguments for the case that pronouns encode procedural meaning – meaning which has a fundamentally pragmatic effect on interpretation, as part of the relevance theoretic comprehension procedure. The claim will be not only that pronominal reference resolution is an essentially cooperative process (Clark and Bangerter 2004) but that pronouns themselves are fundamentally communicative linguistic devices with an underspecified semantics, used by speakers in order to point their addressees towards the intended referent(s).

## **1. Concepts and Things**

One of the fundamental tenets of a relevance theoretic approach is the cognitive nature of the underpinnings of the theory, and indeed of the theory itself. As we shall see over the course of this paper, a change of perspective in this direction and away from the traditional more formalist view turns out to be a fruitful one, in that we begin to see greater generalisations regarding pronominal usage and interpretation, and are then in a position to ask different, deeper, and more interesting questions, and receive rather fuller answers.

Relevance Theory takes the reasonably uncontroversial view of the mind as involving representations of some kind which are manipulated by the mental computational apparatus. (an approach broadly parallel to that of Fodor (e.g. 1980, 1983) and others). One useful way of thinking about this sort of system is in terms of concepts. As Aitchison (1994) states, whether or not we want to accept an abstract layer of concepts as separate from word meaning, it is generally assumed that words are linked to things in the world via concepts. If such mental representations do indeed take the form of concepts at some level, our mental computational apparatus must include some system for the manipulation of those concepts.

The application of such a view to the processes of communication, and more specifically utterance interpretation, yields a model which involves two different types of process. As Wilson and Sperber put it:

a modular decoding phase is seen as providing input to a central inferential phase in which a linguistically encoded logical form is contextually enriched and used to construct a hypothesis about the speaker's informative intention. (1993: 1)

Clearly, these two processes must be of a radically different nature, one based on the decoding of the linguistic signal into conceptual representations, and the other appealing to cognitive faculties of inference in order to reason towards a rational hypothesis concerning the intended meaning of that signal, and its import (relevance) for the individual(s) concerned. The

question is the relative importance of these two processes in relation to each other. Many have argued, perhaps beginning with Grice, that a significant amount of inferential processing is needed in order to interpret utterances, particularly in terms of the notion of implicature, (essentially, the implicit content of an utterance), a position which is now widely accepted. However, one of the key advances of Relevance Theory is the demonstration that such inferential processing is not just a factor in the construction of implicatures. Carston (2002) shows convincingly that linguistically encoded meaning underdetermines not only 'what is meant' by a speaker in a particular context (a point disputed by exceeding few), but also 'what is said' or explicit: a point of view which she terms "The Underdeterminacy Thesis" (2002: 19). In short, she argues, inferential processing is not confined to implicit content (as Grice had argued) but also has a significant bearing on explicit content.

Consider the semantics of a pronoun, say 'he'. Apart from some sort of gender feature and some notion of the type of linguistic element such a lexical item may replace or stand for, we seem to be able to say little about what 'he' might **mean** - strikingly unlike other sorts of nouns like

**hawk** *n* 1      A bird of prey used in falconry; any diurnal bird of prey. Now esp. any of the smaller or moderate sized birds of the family Accipitridae with relatively short, rounded wings.  
(taken from The Shorter Oxford Dictionary)

We clearly have a 'concept' HAWK<sup>1</sup>, but we don't seem to have a concept HE. Of course, a central observation to be made about indexicals in general, and pronominals in particular, is their context dependence, but it is rather less clear what this means in theoretical terms. The 'meaning' of 'he' in a context depends on who 'he' refers to. What I am interested in here is the process by which speakers work out this referent (clearly a cognitive process in some sense), and the role of linguistic and non-linguistic cues in that process.

The other key question arising here is the sort of concept we are talking about. How does a hearer know what sort of entity a pronoun is referring to amongst the mass of NPs in the lexicon? For Powell, the crucial point is one of individuality: the question of whether or not we believe that a given concept is a "representation of an individual" (Powell 1998: 13). He draws a distinction between *individual concepts* (those which we believe correspond to an individual in the world), and *general concepts* (those which we do not believe to uniquely represent such an individual). On this schema, each individual concept will contain one or more general concepts, making up a 'dossier' of information.<sup>2</sup> To illustrate, a speaker might have an individual concept of 'my best friend', which would presumably be made up of a range of different sorts of information gained both by direct contact with that person, and otherwise (reports of other people etc.), and contain general concepts such as 'friend' and 'best' (and, most likely, the general concept 'best friend'). Similarly, he may well have an individual concept of, say, 'the world's strongest man', likely to contain very little information save 'is the world's strongest man', and the general concepts 'man', 'world' etc. This distinction will turn out to be useful later on.

---

<sup>1</sup> I adopt the general convention of using block capitals to refer to mental concepts rather than linguistic items.

<sup>2</sup> Recanati's conception distinguishes between *egocentric* concepts - "temporary dossiers dominated by non-descriptive (perceptual) information" (Powell 1998: 12), serving to register information gained in a certain way (i.e. primarily perceptually), and encyclopaedic concepts, seen as much more "stable, long term dossiers of predominantly descriptive information" (Powell 1998: 12).

So, consider the truth conditions for a sentence like:

- 1) he is wearing pyjamas.

Clearly, this is true iff the person referred to by indexical 'he' is indeed wearing pyjamas. It seems that it is the referent of the pronoun which enters into considerations of truth or falsity, and not the pronoun itself. The proposition expressed thus contains the referent of the pronoun, the consequence being that pronoun resolution must take place at a sub-propositional level. We are seeing inferential pragmatic processing, the output of which enters into the proposition expressed.

What are speakers doing when they interpret a pronoun like this one? Intuitively they seem to be following a heuristic along the following lines:

Accept the first candidate referent that yields an overall interpretation that is relevant. (paraphrased from Erku & Gundel (1987: 541-3) by Wilson & Matsui 1998:188)

However, we clearly want to be rather more explicit than this regarding the nature of the sub-processes involved in the assignment of such reference to a pronominal, and the contribution of the pronominal itself. Sperber & Wilson (1986/95) argue that cognitive processes are geared towards maximising relevance, defined thus by Hall:

Relevance is a potential property of inputs to cognitive processes, and is a positive function of cognitive effects and a negative function of the processing effort required to produce those effects. (Hall 2004: 5)

In short, an utterance is relevant if it achieves a cognitive effect, and as it is the speaker's prerogative to make his utterance worth the attention of his intended addressee, the claim is that any ostensive stimulus (a paradigm case being linguistic communication) carries a presumption of its own relevance. This is known in the theory as the (Communicative) Principle of Relevance. The extension of this principle is the assumption that an utterance (and the linguistic items within it) will achieve relevance in certain ways which the speaker might manifestly have foreseen, and which the hearer can safely assume were so predicted by the speaker. It therefore seems reasonable to suggest that a speaker's utterance of a pronoun will achieve relevance by uniquely picking out an accessible individual from the context, thus satisfying the hearer's expectations of relevance.

The other key point which comes out of this relevance theoretic conception of communicative processing in general, and pronominal reference resolution in particular, is its cooperative nature. For relevance theorists, and many others working in pragmatics and related fields, the notion that communication involves awareness and consideration of an intended addressee is crucial, a situation underlined by the relevance theoretic claims regarding modularity, and the close ties between the pragmatic side of utterance interpretation and more general skills of what Sperber calls 'mind-reading'.<sup>3</sup> As Clark & Bangerter (2004) go to some lengths to illustrate, the traditional view of reference as being an autonomous, ahistorical, addressee-blind act has been shown by many experimental and field observations to be at best inadequate, and at worst just plain wrong (ibid. 26-27). Consideration of mutual

---

<sup>3</sup> Essentially, the claim here is that pragmatic interpretation is an exercise in mind-reading, involving the inferential attribution of intentions, but one that makes use of a dedicated comprehension sub-module within the more general mind-reading ability (see for example Sperber 1994, Sperber & Wilson 2002).

context, both immediate and historical, physical and linguistic, external and internal, plays a key role not only in the interpretation of referring expressions, but also in their production, a situation which seems all the more relevant for uses of pronominals.

## 2. Conceptual and Procedural Meaning

In terms of the semantic side of this discussion, Kaplan (1989) provides some interesting input: he distinguishes between the 'content' and the 'character' of lexical items. For pronominals, 'content' is the individual, and 'character' refers to a rule for identifying the content of such an expression in any given context. Wilson & Sperber (1993) reformulate this distinction, in terms of a distinction not within some concept of 'meaning', but between two different types of encoded meaning: conceptual meaning and procedural meaning. The crux of this argument is the pronoun 'I' in the following sentence:

2) I do not exist.

Kaplan argues that if 'I' means 'the speaker of this utterance', such a sentence would be necessarily false – its truth conditions being that the sentence is true in any situation where the speaker of the sentence does not exist. What we are seeing here is an instantiation of the encoding of the concept of 'the speaker'.<sup>4</sup> If, however, 'I' is treated as an instruction to the hearer to identify the referent of the pronoun by first identifying the speaker of the utterance, (i.e. a procedure), and deriving a referent through a process of pragmatic inference, we do not have such a problem: 'I' would be used here to refer to an individual in a context, and while the sentence would most likely come out false, it would not be necessarily false.<sup>5</sup> As Wilson & Sperber claim, Kaplan's distinction is a striking forerunner of the conceptual/procedural one in Relevance Theory, and indicates that treating such pronominal elements as encoding procedures rather than concepts looks very much like the way we want to go, particularly as the reformulation accounts straightforwardly for the fact that pronominals do not appear in explicit propositional content: their meaning is computational, not representational, and so is not the sort of meaning that would or indeed should appear on the surface.<sup>6</sup>

Procedural meaning was first developed by Diane Blakemore (1987) in relation to the account of the two-phase process of utterance interpretation discussed above: decoding and inference. In such a model based on a Fodorian representational-computational system and

---

<sup>4</sup> The notion of this being the 'concept' of the speaker is important here in the context of what follows in the discussion of the distinction between conceptual and procedural meaning. The upshot of it is if 'I' semantically encodes the concept of 'the speaker', no other referent is possible, so rendering any such sentence necessarily false (see also discussion below of post-it notes and answerphone messages).

<sup>5</sup> To use a slightly strange example for illustration, think of a website that has a link to another page on it. When that link is followed, a page is displayed which simply contains the text "I do not exist yet". What we have here is an illustration of both sides of this argument: if 'I' here is the concept of the speaker (i.e. the page you are looking at) it is clearly false as we are looking at that page. If however, 'I' requires the addressee to find an individual concept from the starting point of the speaker, the sentence does not come out false, as 'I' then refers to the page that the link purports to direct the browser to, which indeed does not exist – there is only the holding page that carries the text. (The interpretative distinction being made here is between 'the page you are looking at' and 'the page you wanted to be looking at'.)

<sup>6</sup> For Kaplan, "they [indexicals] 'determine' the content (the propositional constituent) for a particular occurrence of an indexical. But they are not 'part' of the content (they constitute no part of the propositional constituent)" (Kaplan 1989: 523). Kaplan, of course, still needs some sort of ad hoc mechanism to prevent the 'character' from showing up in truth-conditional content – perhaps a feature along the lines of Recanati's REF feature (Recanati 1993).

governed by principles of relevance, this idea of another kind of meaning seems quite a natural one. If the inferential phase plays such a significant role, as the evidence seems to suggest, it may not be immediately obvious to a hearer how the speaker intends his utterance to be interpreted, and what contextual assumptions should be used to derive what sorts of effects. Therefore, Blakemore argues, one might expect that languages and human users of those languages would have developed some means by which the hearer might be guided towards firstly the intended context and cognitive effects, and thus towards the intended meaning. So, procedural expressions reduce the processing effort required on the part of the hearer by limiting the range of potential hypotheses that must be evaluated concerning the intended meaning, so contributing to the overall relevance of utterances.

Wilson and Sperber (1993) cite one piece of direct evidence for the general conception of linguistically procedural items in discourse. The semantic distinction between conceptual and procedural meaning reflects a particular cognitive opposition, namely that between representation and computation. So, utterance interpretation should arguably be categorised in terms of the formation and manipulation of conceptual representations. In this type of model, we also want to claim that thoughts are structured strings of concepts, and human beings can typically be conscious of their thoughts. If we accept this, it follows that the meaning of a linguistic expression that encodes conceptual information should be mentally accessible, in the sense that a speaker should be able to bring it to mind. Native speakers of a particular language generally do have specific ideas about the meanings of lexical items in their language, or the concepts invoked by them. However, there are also computational processes that occur in the mind to which human beings do not seem to have such direct access: namely phonological computations, syntactic computations, or indeed the inferential computations used in the comprehension of an utterance. Blakemore's account predicts that the 'meanings' of linguistic items which encode procedural information should be very difficult to 'bring to consciousness', and this is what we seem to find.

If 'now' or 'well' encodes a proposition, why can it not be brought to consciousness? [...] The procedural account suggests an answer [...]. Conceptual representations can be brought to consciousness: procedures cannot. We have direct access neither to grammatical computations nor to the inferential computations used in comprehension. (Wilson & Sperber 1993: 16)

While this argument was originally proposed in terms of non-truth-conditional expressions like discourse connectives, it seems that items like pronouns have a very similar status in cognitive terms. In a particular context, speakers will quite happily provide a 'definition' of 'he' relating to a specific referent in the discourse or situation: "he means Dan". While this is a clearly non-technical use of 'mean', we do not want pronominals to be infinitely linguistically ambiguous. As formal semanticists claim, there is a sense in which these expressions are 'variable(s)', though such a formulation tells us little either about the nature of the semantics of pronominals, or the processes by which they are resolved. Heim & Kratzer for example have this to say:

If pronouns are listed in the lexicon at all, they are listed there without an index and as semantically vacuous items. (1998: 274-5 (footnote))

They, and many others, talk in general terms about assigning to the pronoun 'the most salient individual that allows the hearer to make the most sense of the utterance', but say little about

either the processes by which that is accomplished, or how they define salience.<sup>7</sup> It is precisely these underlying processes of reference assignment that concern us here.

### 3. Procedures and Pronouns

So, what might these procedural meanings for pronouns look like? Firstly, let us consider 'I'. Using the idea of 'individual concepts' discussed above, and taking Wilson & Sperber's initial (1993) formulation ("an instruction to the hearer to identify the referent of the pronoun by first identifying the speaker of the utterance") as a starting point, the encoded procedure for 'I' might look something like *'find an individual concept of the speaker'*. It would then be up to the pragmatic component to apply general principles of relevance and the comprehension procedure (which I'll come to shortly) to arrive at the intended referent.<sup>8</sup>

It is generally true that in utterance contexts there are rarely problems of interpretation related to the use of 'I'. However, there is a class of cases which do seem to pose problems for the traditional approach to indexicals generally, and 'I' in particular: answerphone messages and post-it notes.<sup>9</sup> In traditional terms, whoever produces an utterance, wherever they are and whenever this 'producing event' happens to be, it must be true that the person who produces that utterance is at the place where it was uttered at the time it was uttered. Assuming a Kaplanian semantics of 'I', 'here' and 'now' for a moment, we seem to be forced into the position of claiming that the following sentence cannot be true in any context:

3) I am not here now.

However, the test case of an answerphone message including this sentence seems to be a reasonably clear instance in which the utterance of this sentence is both true and meaningful, contrary to predictions of the theory.<sup>10</sup> For interpretation of such cases, there obviously needs to be both an attribution of intention to the speaker on the part of the caller who hears the message, and a certain familiarity with the basic notion of being able to record such a message in advance of the situation in which it is heard and interpreted. Now, while cases such as this

---

<sup>7</sup> Salience is, of course, an extremely complex issue, and one that has puzzled psychologists and linguists alike. Intuitively the idea is clear, but its definition and integration into any framework has proved extremely problematic (See Ariel 1990, Gundel et al. 1993, Almor 1996). Breheny (forthcoming) for example, in a paper on anaphoric pronouns, argues that pragmatic approaches while being on the right track, "are of questionable value unless a coherent story about salience or accessibility is provided" (forthcoming: 5). It is interesting to note that many of the critics of Relevance Theory level this lack of an overt formulation for salience as counting against the paradigm, while Deirdre Wilson (personal communication) has indicated that Relevance Theory was neither designed to provide such a formulation, nor does it have need of one. A combination of general relevance theoretic principles and the comprehension procedure should do the job for us anyway.

<sup>8</sup> In most cases, it will be the intended referent that is found, but this is not necessarily true for all cases. One of the additional advantages of this sort of approach is that it can account for instances of misunderstanding, miscommunication, error and sloppiness through considerations of relevance and the application of the comprehension procedure.

<sup>9</sup> See, for example, Sidelle (1991), Predelli (1998, 2002), Corazza et al. (2002), Powell (2002).

<sup>10</sup> To my mind, I think there may be an underlying issue with this line of argument regarding the defining characteristics of an 'utterance'. In cases such as this of deferred utterances, is it really legitimate to consider the playback of a recording and instance of an 'utterance' proper? However, this is a minor objection, and actually cuts both ways, given the fact that at the time of recording (surely one possible time of utterance) there is firstly no addressee for the utterance, (the sentence is intended for any particular hearer at some undefined point in the future), and secondly, it is manifestly false at that time of utterance. Clearly, these are complex, fringe cases, but nevertheless, I think the intended point is reasonably clear.

arguably depend more on the interpretation of 'now', there are also instances which are clearer in their application to the problem of indexical 'I'. Walking past the door of a personal office, I see a note pinned to it saying:

4) I am on leave today.

This seems comparable with the answerphone case. Unbeknown to me however, the note was not actually written by the occupant of the office in question, but by one of his colleagues who noticed a string of people knocking on the door during the early part of the working day, and knowing that his colleague was not going to be there until the following day, wrote the message. Again we have a true and informative instance of communication, though here the token 'I' seems not to refer to the agent of its tokening, (the writer of the note), but to the occupant of the office. This underlines the point that uses of 'I' need to refer to an individual concept of the speaker that is relevant in the particular context, and not necessarily to the direct agent of the utterance.

One thing these examples undoubtedly do is underline the importance of the hearer (reader) in the interpretation of utterances, and the context of interpretation, rather than necessarily the context of production. It is clear that in the both of the cases given, the intended interpretation (and indeed the one which is unproblematically derived by the hearer) is unambiguous, and relevant in the context. By making use of a procedural semantics for 'I' (as stated above) alongside the relevance theoretic comprehension procedure (see below), the resolution of the pronoun in context proceeds without a hitch, the resulting assignment being optimally relevant<sup>11</sup> in that context. (Note again the fact that the process is a cooperative one involving both speaker and hearer.) The attribution of a specific communicative intention to the speaker in each case (assuming the requisite encyclopaedic and background knowledge and experience), something of the order of 'this explanation is an answer to the implicit question raised by my absence', thus combines with linguistic form and contextual assumptions, and guided by the principle of relevance, results in successful communication, manifested by successful reference assignment in the case of the pronoun.

Adopting this approach to pronominal interpretation also underlines the crucial point that pronominals are communicative in nature – they are a linguistic device that can be used by a speaker in order to aid the process of reference resolution for his hearer, while not expending too much time and energy in producing fully specific (and probably repetitive) descriptive noun phrases. In essence, in a communicative situation, a speaker who wants to refer to some individual (or thing, or idea) has various options including exhaustive description, use of a proper name, use of a pronoun, etc. (leaving aside any physical means he might employ such as pointing), which both cost him in terms of production effort but also cost his hearer in processing and interpreting them. On the relevance theoretic model being put forward here, the presumption of relevance works in a similar way to well-known Gricean notions of quantity: to paraphrase, 'don't use a more specific expression when a less specific one will do'. So, in a context where the speaker's assessment reveals a reasonably accessible referent that he wants to refer to and that the hearer is also likely to be able to retrieve easily, he is entitled to use a minimal form such as a pronoun. If he does not do this, the hearer is

---

<sup>11</sup> In Sperber & Wilson's technical sense (1986/95). "*Presumption of optimal relevance*  
(a) The set of assumptions **I** which the communicator intends to make manifest to the addressee is relevant enough to make it worth the addressee's while to process the ostensive stimulus.  
(b) The ostensive stimulus is the most relevant one the communicator could have used to communicate **I**." (1995: 158)

entitled to expect this to have been a conscious decision on the part of the speaker, and thus expect there to be extra cognitive effects to be derived over and above the simple reference assignment. The communicative function of the procedural meaning is to provide more or less direct evidence for the hearer as to the conclusions his speaker is expecting him to reach (i.e. the intended reference assignment) as a result of the inferential process of interpretation. Essentially, it allows the hearer to short-circuit the full process of inference and go straight to the referent, which is probably (but not necessarily) the one intended by the speaker. Pronouns thus allow speakers to economically point their hearer(s) towards the intended referent(s).

Intuitively, we probably want to make very similar proposals for the treatment of 2nd person 'you', as Powell (1998: 15) suggests. Again, speakers are clearly making reference to an individual concept of some sort in using this pronoun, though this time regarding the hearer.<sup>12</sup> So, we might postulate something along the lines of '*find an individual concept of the hearer*'. In many cases, of course, this process will result in the instantiation of the hearer himself as the referent of the speaker's use of 'you', and this is precisely the result that we want. For reasons of space, I will leave further discussion of 'you' in terms of its plural usage, and indeed the many interesting issues raised by 'we' for another time. Suffice it to say that such terms will, on this account, encode a complex, two-step procedure involving what Powell terms 'pragmatic deferral' (Powell 1998: 18): firstly, the location of an individual concept of the speaker/hearer, and then the recognition of a relevant group of which that individual concept is a member. Essentially, this will play out as a direction of the hearer to a particular entity (whether singular or plural) while leave him to then work out the details pragmatically, dependant on features of context, and constrained by general considerations of relevance.

Of more direct relevance to us here is how to deal with gendered pronouns such as 'he' and 'she'. Kaplan would probably see the semantics of 'he' as directly constraining reference to a male entity, but not appearing in the proposition expressed. However, Larson & Segal (1995) argue that we should "treat gender as semantically inert" (1995: 214), and consider it as providing only pragmatic guidance to the interpretation of such forms. They cite the situation of a speaker pointing to King's College London and uttering the following sentence:

5) She is going to be closed over Christmas.

While the utterance is clearly anomalous in some sense, it seems to be the case that the speaker has succeeded in fixing the referent of the pronoun through his overt gesticulation, and we do not want to claim that the pronoun 'she' could not possibly refer to King's. But, neither is the utterance straightforwardly false. Powell supports this conclusion using the case of Dr. James Barry, a prominent nineteenth century doctor, who was discovered after his death to have been a woman. Imagine the situation where Amy knows the truth, but her friend Ollie does not:

6) Amy: When he was laid out after he died, they discovered that he was actually a

<sup>12</sup> The 'hearer' here should not be confused with any old person who hears what is said – in the case of singular *you* it will be the addressee. (Thanks to an anonymous reviewer for pointing this out.) Again, the fact that we are dealing with a cooperative process here is underlined, as recognition of these roles and of mutual context, whether wholly linguistic or reinforced by more physical cues such as gaze direction, both seem to play a role in communication. (Clark & Bangerter for example talk at some length about the role of interaction and collaboration in the establishment and continuation of communicative notions of reference (2004: 33-46).)

woman.

This example shows that the natural way to refer to this individual is using a pronoun with some sort of 'maleness' feature, despite the fact that the referent of that pronoun is actually female. Substituting 'she' gives a rather odd result, making the fixing of the referent on the part of the hearer extremely difficult.<sup>13</sup> In short, it looks as if such gender features on pronouns are not categorical, but rather are interpretive aids, or instructions to the hearer as to the best way to resolve the reference of the pronoun – i.e. they look distinctly procedural.<sup>14</sup> Adopting such an approach would seem to give us a very natural way of integrating these ideas into the theory, and of accounting for such problematic data.

So, the procedural formulation for the pronoun 'he' might look something like this:

*find an individual concept with the feature 'male'*

Thus, presented with (6), an utterance containing the pronoun 'he', Ollie can assume that Amy intended him to use some property of maleness in his search for the intended referent of the pronoun. He is also justified in narrowing the range of his search to individual concepts, whether pre-existing or formed ad hoc, containing the information 'x is male' – i.e. the range of concepts he takes to be concepts of males. The oddness of the variant of the above example using 'she', is also straightforwardly accounted for in this picture by standard relevance theoretic principles. Such a speaker would be presenting her hearer with the property of femaleness as an interpretive signal, so through the presumption of relevance, justifying a search of individual concepts of whatever sort containing the feature 'female' on the part of the hearer. However, Amy's intended referent for the pronoun contains the information 'x is male' at this point in the mind of the hearer, resulting in gratuitous processing effort on their part, and so failure of optimal relevance, and probably of the process of pronoun resolution itself.

This all raises the question of the nature of pronoun representation. One of Powell's claims is that indexicals “encode their status as individual concept communicators” (Powell 2002: 24), as well as some sort of property that plays this pragmatic role in interpretation. It would seem to me that the most sensible conclusion to draw from this would be to consider pronouns not as empty lexical items, (as Heim & Kratzer claim), but as pro-concepts, carrying some information to direct the hearer to the intended referent (procedural meaning), but where that referent seems to amount to something akin to Kaplanian 'content'. In that sense, we might see them as the ultimate variable, dependent largely on context and pragmatic utterance interpretation strategies for their instantiation, while providing some guidance as to the sort of entity required to instantiate them. Indeed, there is a pre-existing relevance theoretic construct which seems to have significant common ground with this idea – that of the concept schema (Carston 2002: ch. 5). While its original sphere of application was underdetermination, particularly in adjectivals, it links in to general ideas about the role and importance of pragmatic inference in interpretation of lexical items, and seems to find a natural home in consideration of pronominals, where representation is schematic and fundamentally

---

<sup>13</sup> There is a distinctly metarepresentative edge to this example in the use of pronouns, given that Amy is essentially attributing the belief that the individual was male, so requiring the use of a masculine pronoun, to the contemporary individuals. (Thanks to an anonymous reviewer for this observation.)

<sup>14</sup> The 'male' feature encoded by 'he' is thus pragmatic in nature (in English) rather than being categorical and semantic. (See Hedley (in press) for discussion of gender features on French pronouns.) Features like animacy look rather like this too.

underspecified. Such an analysis would have the added bonus of integrating pronouns into a more general picture of what the semantics of lexical items might look like, which must be a good thing.

#### **4. Pronouns and the Relevance Theoretic Comprehension Procedure**

In adopting the relevance theoretic paradigm, I also adopt the relevance theoretic comprehension procedure, characterized thus by Carston:

- (a) Consider interpretations (disambiguations, reference assignments, enrichments, contextual assumptions, etc.) in order of accessibility (i.e. follow a path of least effort in computing cognitive effects).
- (b) Stop when the expected level of relevance is reached. (2002: 143)

Before presenting an example which will show how the procedural meaning of the pronoun interacts with the context and relevance theoretic principles to produce an interpretation, there is one more piece of theoretical machinery needed: what Sperber and Wilson (1997/98a) call 'mutual parallel adjustment'. This mechanism mediates the inference processes that operate on logical forms to produce propositional representations of the sort that are typically communicated in linguistic exchanges. It can affect explicit and implicit content, context, or cognitive effects, and is constrained by the general comprehension strategy detailed by the theory: i.e. the principle of relevance. The end result of this process consists of (sets of) premises and conclusions which make up a valid argument (Carston 2002: 143), but the crucial point is that the inferences and reasoning processes involved do not necessarily occur step by step, in a resolutely deductive fashion. The idea is that the linguistic form of an utterance, alongside strong considerations of relevance, may well lead directly to a particular conclusion (or type of conclusion), or give rise to more or less specific expectations of cognitive effects (in the case of pronominals, a specific reference assignment). In such cases, premises would then be constructed by backwards inference, potentially on both the explicit and implicit levels, which would make for a sound process of inference to the required conclusion. Under this conception, it is quite conceivable for several backward and forward adjustments of content to take place before an equilibrium is attained which meets the current expectations of relevance in the particular context.

One piece of indirect evidence for this picture relates to the nature of utterance interpretation generally, and the psycholinguistic reality of the mental processes involved. Psycholinguists have long found that the initiation of the process of sentence interpretation does not wait for the end of a linguistic unit, but rather occurs 'on the hoof'. In practice, human speakers do not seem to need fully formed linguistic representations in order to start down the road of interpretation. Such a situation is not just accounted for, but predicted by Relevance Theory, according to which interpretive hypotheses concerning both explicit and implicit communicated assumptions are made rapidly, on-line, 'locally' and in parallel. The fact that relevance theorists consider the pragmatic inferential system as modular and central, rather than (a part of) a linguistic module also seems to support this conception, with linguistic processing generally being constrained in some way by considerations of relevance. Contextual assumptions are also continuously updated as a discourse progresses, painting a dynamic picture of communication and interpretation. As Wilson & Sperber characterise such a conception:

utterances are not signals but pieces of evidence about the speaker's meaning, and comprehension is achieved by inferring this meaning from the evidence provided. (2000: 229)

Thus, the collation and combination of evidence inferentially to produce an attributed communicative intention guided by overarching principles of relevance, need not, and I would argue does not (in most cases) involve a necessarily linear pattern of reasoning from premise to conclusion. This move away from total reliance on decoding towards a model based on the inferring of speaker intentions allows, as we will see, significant progress to be made in the general understanding of pronominal anaphora.

Consider the following example (adapted from Carston (2002: 146ff)):

- 7)     Caller:         Can I speak to The President?  
       Secretary:    No, I'm sorry. He's busy.

Consider the interpretation of the pronoun in the second sentence of the Secretary's reply. Bearing in mind the nature of the process of mutual adjustment, and the fact that formulations of the sort presented here are illustrative rather than being explicit proposals of formalised inferential steps, the sort of pattern that might result in the mind of the hearer is as follows:

- 8)     a. S has uttered a sentence with the logical form: [he is busy]<sup>15</sup>  
       b. S's utterance is optimally relevant. (*Presumption of relevance*)  
       c. S's utterance of the pronoun will achieve relevance in a particular way – by pointing towards particularly contextually salient individual (concept).  
       d. The President is busy. *Procedural meaning of pronominal* ('Find an individual concept with the feature 'male').  
       e. individual concept of the 'The President' - the most accessible individual concept in the context with a 'male' feature, needing little effort to access, and producing significant cognitive effects, so reaching the expected level of relevance.  
       f. 'The President' is instantiated in propositional form.

By following the path of least effort, as specified by the comprehension procedure, the assignment of the most contextually salient referent that satisfies expectations of relevance proceeds straightforwardly, and in a way that the speaker could manifestly have foreseen: i.e. it was the speaker's intention for the referent of the pronoun used to be highly accessible in the context. Otherwise he would not have used the pronoun. In performative terms, one might say that the speaker's use of a pronoun is a signal to the addressee not only that there is a contextually salient individual (or group of individuals) to which the speaker might be expected to refer, but also that that individual (or group) is highly relevant in that particular context. As Carston summarises:

On the relevance-theoretic account, tentative interpretive hypotheses concerning intended referents [...] are made on-line and are subsequently confirmed or disconfirmed, depending on whether or not they contribute to an overall interpretation that meets the expectation of relevance. (2002: 151-2)

---

<sup>15</sup> For discussion of other parts of this utterance, such as the nature of the concept 'busy' I refer the reader to Carston's original discussion of this example (Carston 2002: 146-7).

The cases I have dealt with so far have been essentially indexical uses of pronouns, but I agree with Powell (2002: 4: 1) that “a proper theory of indexicals should be able to provide a unified account of anaphoric and non-anaphoric uses” of pronouns, so I shall now briefly show how the proposed account might extend to other cases whose treatment is often considered to be of a different nature: theoretically speaking, intra-sentential anaphora is often thought to be resolved grammatically rather than pragmatically, as are cases of so-called 'bound variable' readings. Take the following example:

9) Yvette came in and she tripped over her gown.

We clearly do not want to say that such pronouns are ambiguous, nor is there any real evidence that they require discrete treatment. The account I have sketched here seems to do the job quite happily: interaction of immediate context, the procedural meaning of the pronoun, general principles of relevance and the comprehension procedure result in a clear interpretation on which 'she' is interpreted as 'Yvette'. (I leave the reader to construct a pattern analogous to (8).)

What about so-called bound-variable readings? On an intuitive level, it would seem that cases of pronoun use like the following are not different in any meaningful way, on a syntactic, semantic or interpretive level, and again accounting for such pronominal uses within the grammar seems potentially redundant. Kempson (1986) makes some strong arguments on this, pointing out that the sorts of properties often thought to individuate the class of pragmatically-based discourse anaphors as separate from those dealt with in the grammar are also exhibited by bound-variable cases – properties such as bridging inferences, licensing dependent on the total implicit content of a preceding sentence, 'givenness' and uniqueness:

- 10) a. Mark's car is in a bit of a state. The exhaust needs looking at.  
b. Every car needs the exhaust looking at.
- 11) a. Jake called Jess a conservative. The insult made him bristle.  
b. Everyone who called his neighbour a conservative later apologised for the insult.
- 12) a. An old lady came over. She expressed her condolences.  
b. Every old lady that came over decided that she must express her condolences.

In both examples (10a) and (10b), the introduction of the expression 'car' seems to license the use of the definite NP 'the exhaust', by virtue of the assumed premise that cars have exhausts, so allowing the inference to the particular exhaust connected to the car in question. Making a fundamental distinction between the interpretation of these two cases, not least one related to the grammar, seems implausible at best. (11a) and (11b) show that the use of the definite NP 'the insult' depends on the assumption that the act of calling someone 'a conservative' should be seen as an insult. Again, intuitions seem robust with regard to the comparability of interpretation and process of interpretation between a discourse and a bound variable case. For (12a) and (12b), it seems clear that the intended referent for the pronoun 'she' is both given (or previously established in the discourse) and unique (there is one female only under consideration in the sentence for each assignment of the quantified expression), both of which are factors described by many as being down to the pragmatic side of interpretation. Do we really want to maintain the idea that these pairs of cases involve fundamentally different semantic representations for the pronouns, varying processes of interpretation, or indeed both?

## 5. Conclusion

This discussion illustrates the gains to be made through a change of perspective towards a more cognitive outlook in the study of pronoun interpretation. As soon as we begin to consider anaphors as encoding procedural meaning which constrains the search for a referent, and as forming part of an ongoing general task of utterance processing and comprehension, previously problematic data seem to become more explicable. For the bound variable cases, we are no longer tied to enforced coreference and indexing with a concrete linguistic antecedent (that doesn't exist for many other instances of such constructions anyway), and as a result the fact that the interpretation of a bound variable pronoun 'depends' on a quantified expression that does not uniquely pick out a referent in the external world looks rather less of an issue. Even the classic cases with 'Nobody' as the quantifying expression are easily tractable under such an approach.<sup>16</sup>

Under this more cognitive conception, examples (10b), (10d) and (10f) would be better thought of in terms of the interpretation of the pronoun being determined by each instantiation of the quantifying expression. What Kempson (1986) proposes is “to assume a pragmatic basis to bound-variable anaphora” (1986: 213) in a similar form to that assumed for so-called 'discourse anaphora', and so to account for the distribution of the phenomena in a unitary way. What is proposed here is similar, and approach in which the process of pronoun interpretation entails the interaction of a fundamentally underspecified semantics (a pro-concept/concept schema containing some element of procedural meaning) with the general context of use, constrained by general principles of relevance, and the relevance theoretic comprehension procedure.

The importance of this notion of 'use' is not to be underestimated, as the picture being developed here regards pronominals as fundamentally communicative mechanisms that can be used by a speaker in a context to pick out a certain referent (or referents). They are an efficient communicative tool that exploits the general utterance interpretation strategy used by hearers (and assumed to be so used by speakers), to indicate relevant individual concepts through the production of a phonologically minimal linguistic item. What the procedural part of the semantics does is allow the hearer to short circuit the inference process, as he has been provided with reliable evidence from his speaker of what the outcome of that inferential process of reference resolution is going to look like. The result of adopting this account is a pragmatic view of the interpretation of pronominal elements, whereby pronominals are seen as “linguistically encoded means for constraining the interpretation process” (Blakemore 2000:472).

## References

- Aitchison, J. (1994) *Words in the Mind: an Introduction to the Mental Lexicon*. Oxford: Blackwell.
- Almor, A. (1999) Noun-phrase anaphora and focus: The informational load hypothesis. *Psychological Review* 106, 748-765.
- Ariel, M. (1990) *Accessing Noun-Phrase Antecedents*. London, New York: Routledge.

---

<sup>16</sup> i) Nobody thought that he would wish to live with the giants of Brobdingnag.  
(Note also the effect of stressing the pronoun 'he' in this case forcing an exophoric reading.)

- Blakemore, D. (1987) *Semantic Constraints on Relevance*. Oxford: Blackwell.
- Breheny, R. (forthcoming) Pragmatic Analyses of Anaphoric Pronouns: Do Things Look Better in 2-D? To appear in M. Garcia-Carpentero & J. Macia edited book on Two-Dimensionalism for OUP.
- Carston, R. (2002) *Thoughts and Utterances: The Pragmatics of Explicit Communication*. Oxford: Blackwell.
- Clark, H.H. & Bangerter, A. (2004) Changing Ideas about Reference. In Noveck, I. & Sperber, D. (eds.) *Experimental Pragmatics*. Basingstoke: Palgrave Macmillan. 25-49.
- Corazza, E., Fish, W., Gorvett, J. (2002) Who is I. *Philosophical Studies* 107, 1-21.
- Erku, F. & Gundel, J.K. (1987) The pragmatics of indirect anaphors. In Verschueren, J. & Bertucelli-Papi, M. (eds.) *The Pragmatic Perspective: Selected papers from the 1985 International Pragmatics Conference*. Amsterdam: John Benjamins. 533-546.
- Fodor, J. (1983) *The Modularity of Mind*. Cambridge, MA: MIT Press.
- Gundel, J.K., Hedberg, N., & Zacharski, R. (1993) Cognitive Status and the Form of Referring Expressions in Discourse. *Language* 69, 274-307.
- Hall, A. (2004) The meaning of *but*: A procedural reanalysis. *UCL Working Papers in Linguistics* 16, 199-236.
- Hedley, P. (in press) Gender and the interpretation of pronouns in French: a view from Relevance Theory. *Oxford Working Papers in Linguistics* 9.
- Heim, I. & Kratzer, A. (1998) *Semantics in Generative Grammar*. Oxford: Blackwell.
- Huang, Y. (2000) *Anaphora: A Cross-linguistic Study*. Oxford: OUP.
- Kaplan, D. (1989) Demonstratives. In Almog, J., Perry, J. & Wettstein, H. (eds.) *Themes from Kaplan*. Oxford: OUP. 481-563.
- Kempson, R. (1986) Definite NPs and Context Dependence: a unified theory of anaphora. In Myers, T. et al (eds.) *Reasoning and Discourse Processes*. New York: Academic Press. 209-240.
- Larson, R. & Segal, G. (1995) *Knowledge of Meaning: An Introduction to Semantic Theory*. Cambridge MA: MIT Press.
- Powell, G. (1998) The deferred interpretation of indexicals and proper names. *UCL Working Papers in Linguistics* 10, 143-172.
- Powell, G. (2002) Chapter 4 of PhD thesis - Reference and Relevance: Indexicals.

Unpublished manuscript - UCL.

- Predelli, S. (1998) 'I am not here now'. *Analysis* 58, 107-115.
- Predelli, S. (2002) Intentions, indexicals and communication. *Analysis* 62, 310-316.
- Recanati, F. (1993) *Direct Reference: From Language to Thought*. Oxford: Blackwell.
- Sidelle, A. (1991) The answering machine paradox. *Canadian Journal of Philosophy* 21, 525-539.
- Sperber, D. (1994) Understanding Verbal Understanding. In Khalifa, J. (ed.) *What is Intelligence*. Cambridge: CUP. 178-198.
- Sperber, D. & Wilson, D. (1995) *Relevance: Communication and Cognition*. (2<sup>nd</sup> ed.) Oxford: Blackwell.
- Sperber, D. & Wilson, D. (1997) The mapping between the mental and the public lexicon. *UCL Working Papers in Linguistics* 9, 107-25.
- Sperber, D. & Wilson, D. (2002) Pragmatics, Modularity and Mind-reading. *Mind and Language* 17, 3-23.
- Wilson, D. & Matsui, T. (1998) Recent approaches to bridging: Truth, coherence, relevance. *UCL Working Papers in Linguistics* 10, 173-200.
- Wilson, D. & Sperber, D. (1993) Linguistic Form and Relevance. *Lingua* 90, 1-25.
- Wilson, D. & Sperber, D. (2000) Truthfulness and Relevance. *UCL Working Papers in Linguistics* 12, 215-54.

*Paul Hedley  
Magdalen College, Oxford  
High Street  
Oxford  
OX1 4AU  
UK*

*paul.hedley@magd.ox.ac.uk*