Chomsky and pragmatics[1]

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1. Introduction

Pragmatics is traditionally defined as the study of language use as opposed to language structure, but it is often more narrowly construed as the study of linguistic communication, or speaker's meaning, or overtly intentional communication (whether verbal or non-verbal). It has been approached in a variety of ways: as an extension of formal grammar, or as a branch of philosophy, sociolinguistics or cognitive science (Ariel 2010; Huang 2017).

The central problem for pragmatics is that what is communicated by use of an utterance may depart from, or go well beyond, the linguistically encoded meaning of the sentence uttered. As Chomsky (1995, 29) puts it, "If intuition is any guide, there seems to be a considerable gap between the semantic resources of language literally interpreted and thoughts expressed using them." Pragmatic processes crucially rely on background or contextual information supplied by the hearer, which may significantly affect the outcome of the comprehension process.

Since the pioneering work of Grice (1957; 1967; 1989), a main focus of pragmatics has been on how the hearer identifies implicitly communicated propositions, or *implicatures* (Allott 2018); however, in recent years there has been increasing interest in pragmatic contributions to explicit truth-conditional content, via disambiguation, reference resolution, adjustment (or 'modulation') of lexical senses, identification of 'unarticulated constituents', and so on (see Carston 2002; Horn & Ward 2004; Recanati 2004; 2010, and references therein). Despite the complexity of the tasks involved and the fact that required contextual information is generally not explicitly spelled out, successful comprehension typically takes place almost instantaneously. The central goal of pragmatics is to explain how it is achieved.

Grice (1957) proposed a definition of *speaker's meaning*[2] based on the overt expression and inferential recognition of intentions. Although his own goals were largely philosophical, his ideas have inspired attempts to develop a cognitively plausible, empirically testable theory of overt intentional communication (see Wilson & Sperber 2012, chap. 1 for an overview). Construed as a branch of cognitive psychology, pragmatics is the study of the cognitive systems apart from the I-language (on which see Allott, Lohndal & Rey introduction to this volume) and the parser (Kush & Dillon, this volume) which enable speaker and hearer (or communicator and audience) to co-ordinate on the intended interpretation, and this is how we propose to treat it here.

The paper is organized as follows. In the next section, we consider some of Chomsky's suggestions about how the cognitive systems underlying human abilities might be investigated. Chomsky is skeptical about the prospects for a cognitive science of pragmatics; in section 3, we discuss his reasons and consider how far this skepticism

may be due to his particular conception of pragmatics. In section 4, we outline an approach to pragmatics that seems to be compatible with his general methodology and is based on an alternative conception of pragmatics that we sketch out.

2. Chomsky's importance for pragmatics as cognitive science

Pragmatics, construed as a branch of cognitive psychology, stands to benefit from advances in the cognitive sciences in the last half of the twentieth century, many of which were inspired by Chomsky's work.

One of Chomsky's suggestions is that the mind, like the body, may consist of a number of discrete systems or "organs", each with its own organizing principles:

> We may usefully think of the language faculty, the number sense, and others, as "mental organs", analogous to the heart or the visual system or the system of motor coordination and planning (Chomsky 1980, 39).

Apart from the faculties Chomsky mentions here, folk physics, folk biology, mindreading (or 'theory of mind') and a possible moral sense have been fruitfully approached along these lines (see Allott & Smith, this volume, for discussion and references). Evidence for a dedicated mental system may come from the fact that the associated ability is species-universal (barring pathology), works fast and automatically, dissociates from other mental systems, and exhibits regularities not found in other domains. The pragmatic ability is an obvious candidate for such treatment, and Chomsky speculates that there may be a dedicated communicative system:

> It could be that one of the systems that develops, either as a distinct module or a component of others, is the kind of "communicative competence" that enables us to use language coherently and in ways that are appropriate to situations … Whether this system, if it exists, is an "inferential, non-modular one" depends on the facts of the matter… My own personal impression … is that talk of "general inferential or problem-solving capacities" tends to be rather empty, and that when we investigate actual cases …, we find that specific mechanisms are assumed." (Chomsky in Stemmer 1999, 395)

Modular approaches to pragmatics have been explored by Kasher (1991), and by Sperber and Wilson (2002), who treat pragmatics as a sub-module of a more general mindreading module (perhaps itself part of a broader module for social cognition).

A second suggestion of Chomsky's is that idealization is essential to the systematic investigation of nature (see Allott, Lohndal & Rey, this volume.) In order to develop an explanatory account by identifying underlying regularities, we need to abstract away from real but messy phenomena. Since human behavior – including communicative behavior – typically results from interactions among many mental subsystems, this is particularly true in cognitive science. But while the importance of abstraction is well recognized in generative linguistics, it is perhaps less so in pragmatics.

For instance, Gricean pragmatics is often criticized by discourse analysts for using artificial examples designed to illustrate theoretical points, rather than data drawn from recordings of real-life verbal exchanges (Taylor & Cameron 1987; Schiffrin 1994). However, the use of audio recordings and transcriptions of authentic conversations may in turn be criticized for abstracting away from the bodily movements and visual

monitoring that video recordings would reveal. And video recordings fail to capture much of the personal and common history of the participants, which generally affects the outcome of their interaction; and so on. Since idealization cannot be avoided, choices have to be made about which idealizations are likely to be most fruitful. Currently, the main focus in pragmatics is on how interlocutors coordinate on the explicit truth-conditional content of utterances, together with a few determinate implicatures. However, it is important to consider how this account might be extended to cover the social and relational aspects of language use which, as Chomsky notes, are vital in face-to-face exchanges (see Sperber & Wilson 1997; 2015).

A third suggestion of Chomsky's (1965, 4) is about the importance of developing explicit theories. In the case of generative syntax, the contrast is with traditional grammars, which typically presuppose rather than explain the reader's intuitive knowledge of the core principles of language (Alexiadou and Lohndal, this volume). Sperber and Wilson (1986/1995, 37) make a similar point about Gricean explanations in pragmatics:

> Although based on an insight which seems quite correct, and although somewhat more explicit and systematic than the intuitive reconstructions supplied by unsophisticated speakers, the analyses of implicatures that have been proposed by pragmatists have shared with these reconstructions the defect of being almost entirely *ex post facto* …

In their view, the goal of pragmatics, as of generative syntax, should be to develop theories explicit enough to be empirically testable (see also Carston 2000).

The ideal of explicitness fits well with modelling cognition in terms of computations over representations (see Adger, this volume.) Within this broad picture, there are various understandings of the explanatory role of the computations and representations postulated by linguists and other cognitive scientists. For instance, the principles of pragmatics may be merely instantiated by the pragmatic system rather than explicitly represented: that is, they may be neither known by the person nor stored in a modular database, but simply express true generalisations about the way the pragmatic system operates (see Allott and Smith, this volume on the distinction). Sperber and Wilson (2002/2012, 275) describe their own relevance-based pragmatic principle as merely instantiated by the pragmatic system rather than explicitly represented:

> We have suggested that [utterance comprehension] is based on a dedicated inferential procedure geared to considerations of relevance. These considerations are not spelled out and used as explicit premises in the procedure, but are built into its functioning instead.

3. Chomsky's views on pragmatics

3.1. Pragmatic competence

From early on[3], Chomsky distinguished two aspects of the "implicit theory of the language" that a speaker acquires. One aspect "predicts the grammatical structure of each of an infinite class of potential physical events". The other specifies "the conditions for the appropriate use of each of these items" (Chomsky 1962, 528).

From the late 1970s, Chomsky described knowledge of this second aspect (i.e., knowledge of a "system of rules and principles" determining conditions for the appropriate use of language) as "pragmatic competence":

> For purposes of inquiry and exposition, we may proceed to distinguish "grammatical competence" from "pragmatic competence", restricting the first to the knowledge of form and meaning and the second to knowledge of conditions and manner of appropriate use, in conformity with various purposes. (Chomsky 1980, 224)

At this stage, he considers that there may be a distinct mental faculty for pragmatics ("It might be that pragmatic competence is characterized by a certain system of constitutive rules represented in the mind"), and sees this as an empirical hypothesis ("it is possible in principle for a person to have full grammatical competence and no pragmatic competence" (ibid, 59)). Later, he cites evidence that human pragmatic and conceptual systems taken together are distinct from I-language:

> There is reason to believe that the I-languages ("grammatical competence") are distinct from conceptual organization and "pragmatic competence," and that these systems can be selectively impaired and developmentally dissociated. (Chomsky 1992a, 212)

Chomsky's remarks on pragmatic competence may have been influenced by the emergence of pragmatics as an area within linguistics at around this time. By the late 1970s, a generation of scholars were publishing in the field. Their work was strongly influenced by Grice's 1967 William James Lectures, which were circulating in manuscript and already published in part (Grice 1975; 1978). Chomsky (1980, 225) comments that pragmatic competence "may include what Paul Grice has called a 'logic of conversation'", and while highly critical of Grice's account of speaker's meaning, he notes that "A theory of speaker's intention may well be a contribution to a theory of successful communication" (Chomsky, 1975, 64).

However, Chomsky's conception of pragmatics differs from Grice's in several respects. In the first place, Chomsky appears to see pragmatic competence as restricted to the use of language, whereas Grice's definition of 'speaker's meaning' is designed to cover both verbal communication and a variety of non-verbal cases (see footnote 1 above and section 4).

In the second place, Chomsky is keen to emphasize that language is not used purely for communication, and his notion of pragmatic competence is intended to cover the full range of uses, whether communicative or not[4]:

> I think a very important aspect of language has to do with the establishment of social relations and interactions. Often, this is described as communication. But that is very misleading, I think. There is a narrow class of uses of language where you intend to communicate. Communication refers to an effort to get people to understand what one means. And that, certainly, is one use of language and a social use of it. But I don't think it is the only social use of language. Nor are social uses the only uses of language. For example, language can be used to express or clarify one's thoughts with little regard for the social context, if any. (Chomsky 1984)

Language is also used for "internal thought", and Chomsky (in Stemmer 1999) describes this as much the most frequent use of language.

However, the greatest divergence between Chomsky and Grice is on the nature of meaning itself. Chomsky's views on meaning were strongly influenced by ordinary-language philosophers such as Austin and the later Wittgenstein ("I assumed from my earliest writings in the mid-1950s a kind of use theory of meaning" (Chomsky 2003, 295).) By contrast, one of Grice's main contributions was to argue, against the ordinary language philosophers, that use does not necessarily give direct insight into meaning and that it is important not to conflate the two.

To take just one illustration, Chomsky (1995, 22–3) discusses a range of cases where the same liquid, with the same chemical composition, is appropriately described in some circumstances as 'water' and in others as 'tea' (see Pietroski, this volume, for discussion). Following the ordinary-language philosophers, Chomsky sees these facts about appropriate use as giving direct insight into the interest-relative nature of word meaning ("we find that whether something is water depends on special human interests and concerns"). Grice's aim was to isolate general principles of language use which strongly reflect "human interests and concerns", thus relieving semantics of the need to deal with such concerns on a word-by-word basis. His proposals have led to the development of a fruitful body of research on *lexical pragmatics* which explores how linguistically specified word senses may be pragmatically 'adjusted' or 'modulated' in the course of the comprehension process, contributing directly to explicit truth-conditional content rather than to implicatures (Carston 1997, 2002; Sperber & Wilson 1998, 2008; Recanati 2004, 2010; Wilson & Carston 2007).[5]

3.2. The creative aspect of language use

A notable development of Chomsky's views came with his discussion of linguistic creativity, the 'creative aspect of language use', and the relation between them (Chomsky 1964; 1966; 1974; 1991). These ideas are developed at length in *Cartesian Linguistics* (1966).

A first kind of creativity, now usually called 'productivity' (Chomsky 1972, 92 n. 21), is the ability to generate an infinite number of sentence structures based on a finite system of rules and a finite stock of lexical items. This is evidenced by the ability to produce and parse novel sentences, and falls within the province of syntactic theory.

A second kind of creativity is what Chomsky calls 'the creative aspect of language use': the ability to use language in ways that are infinite in scope and appropriate to circumstances, but not determined by them. Productivity is arguably a prerequisite for the creative aspect of language use, given that there is no particular bound on the circumstances we may face, but it clearly doesn't explain it (see Hymes 1974, 94). Chomsky cites as precursors Descartes and de Cordemoy, who both argued that the creative use of language cannot be explained by appeal to the actions of a mechanism, and treated it as evidence for a mind or soul. Chomsky agrees with the Cartesians' negative claim, but concludes that is impossible to give an explicit theory of the creative aspect of language use in terms of computations and representations.

As Chomsky notes, a device with an element of randomness may be stimulus-independent, and, as generative grammar shows, a "mechanical system could exhibit infinite diversity" (Chomsky 1974, 28). Equally, as Descartes pointed out, a mechanical device could produce appropriate responses to predetermined stimuli given a set repertoire of programmed responses. So the key aspect of the creative aspect of

language use is appropriateness of language use over an indefinitely wide range of circumstances. In terms of his well-known distinction between problems and mysteries (see Collins, this volume), Chomsky regards this as not a problem but a mystery. We return to this point below.

3.3. Against pragmatic theory

Chomsky consistently maintains that systematic investigation of the use of language has made little progress and may well be impossible (see Allott 2019 for discussion).

One reason he gives is that utterance interpretation involves interaction among many mental systems, and is too complex to be studied systematically:

> There is ... a ... problem, which we can formulate in vague terms but which cannot be studied in practice: namely to construct an 'interpreter' which includes the parser as a component, along with all other capacities of the mind … and accepts non-linguistic as well as linguistic input. The interpreter, presented with an utterance and a situation, assigns some interpretation to what is being said by a person in this situation. The study of communication in the actual world of experience is the study of the interpreter, but this is not a topic of empirical enquiry for the usual reasons: there is no such topic as the study of everything. (Chomsky 1992b, 120)[6]

However, given Chomsky's remarks on the importance of idealization, there is no reason to assume that an explanatory pragmatic theory must deal with everything at once. The goal of the comprehension system is to infer the speaker's communicative intention. This system interacts with many others, combining linguistic information supplied by the parser with information derived from perception, inference, mindreading and short- and long-term memory. Chomsky seems to have in mind a type of 'contextual code model' in which the 'interpreter', "presented with an utterance and a situation", produces an interpretation as output. But contrary to what is often assumed, hearers are not "presented with" a determinate situation or context. They invariably have access to an indefinite range of potential contextual assumptions among which they have to choose in the course of the comprehension process, and one of the goals of pragmatics is to explain how this is done. This is one of several arguments against code-based approaches to pragmatics. (For discussion, see Sperber & Wilson 1986/1995, 3–15, 24–28).

More generally, the most important feature of the comprehension process is that it takes place at a risk. While the hearer's goal in utterance comprehension is to identify the speaker's intended interpretation, there is no pragmatic code – no failsafe procedure which, barring performance errors, will correctly identify this interpretation. Comprehension is irredeemably a matter of non-demonstrative inference; its output is a hypothesis about the communicator's intentions which, however well evidenced, may not be correct. As Sperber and Wilson (1986/1995, 45) put it,

> Failures in communication are to be expected. What is mysterious and requires explanation… is not failure but success.

Given that comprehension is fast, automatic, and species-universal (barring pathology), and given that the speaker's communicative intention cannot be decoded

but only non-demonstratively inferred, it is reasonable to assume that hearers are equipped with a dedicated heuristic for constructing a hypothesis about the intended interpretation, using evidence drawn from a variety of mental systems. Showing what such a heuristic might look like, and how it might apply automatically to information derived from multiple sources would be a notable step towards an explanatory account of pragmatics.

A related, but logically distinct, argument is found in the work of Katz and Fodor (1963, 178–9)[7], and Fodor (1983). In their view, since any type of information, from any source, may play a role in inferring a speaker's communicative intention, a rational hearer would have to consider every conceivable source of evidence in deciding what the speaker meant. Hence Fodor's First Law of the Non-Existence of Cognitive Science: 'The more global ... a cognitive process is, the less anybody understands it" (Fodor 1983, 107). This argument has been much discussed (see Allott 2019 for references), but there are two serious problems with it. First, rationality involves considerations of effort as well as effect; ignoring the effort factor is pathological (Sperber & Wilson 1996). Second, even if it were rational to consult all relevant evidence, it does not follow that this is what interpreters do. Cognitive pragmatics aims at a descriptive, not a normative account.

A third argument of Chomsky's is that language use is a mystery because it is a type of intentional action, and we have no theory of how people choose what to do. As he puts it, "theories of behaviour will always miss the crucial point: the person could have chosen to act otherwise" (Chomsky 1996, 17). The connection with the creative aspect of language use is clear, and it contributes to Chomsky's skepticism about pragmatic theory:

> There is interesting work on precepts for language use under particular conditions – notably the intent to be informative, as in neo-Gricean pragmatics – but it is not at all clear how far this extends to the normal use of language, and in any event, it does not approach the Cartesian question of creative use, which remains as much of a mystery now as it did centuries ago. (Chomsky 2010, 29)

We might grant for the sake of argument that human free choice of action cannot be scientifically studied, but it does not follow that either utterance interpretation or utterance production is equally inscrutable. In the case of utterance interpretation, issues of free will do not seem to arise, and the vast majority of work in linguistic pragmatics has focused on comprehension rather than production. We turn to this research program in the next section. The pragmatics of utterance production has been studied much less, but it seems possible in principle to separate out the factors influencing (a) the formation of a communicative intention and (b) the construction of an utterance that expresses this intention (Kasher 1991, 141; see Pollard 2015 for interesting recent work on utterance production).

4. Critique of Chomsky's conception of pragmatics

4.1. The aims and scope of pragmatics

Pragmatics may be more or less broadly conceived. It has been seen as a theory of language use (as in Chomsky's work) or a theory of 'speaker's meaning' (as in Grice's work). We want to show that neither approach is entirely adequate, and that pragmatics is best conceived as a theory of overt intentional (*ostensive*) communication which covers cases of *showing that* (e.g. holding up an empty glass to show that it is empty) as well as *meaning that* (e.g. saying 'Yes please', meaning that you'd like another drink), since both are deliberate and open attempts to convey information..

According to Chomsky (1980, 225), pragmatic competence "places language in the institutional setting of its use, relating intentions and purposes to the linguistic means at hand". This fits well with traditional definitions of pragmatics as the study of language use. As noted above (section 3.1), Chomsky sees the communicative use of language as only one of several social uses, and treats all such uses as falling within the domain of sociolinguistics:

> There is undoubtedly much to learn about the social uses of language, for communication or for other purposes. But at present there is not much in the way of a theory of sociolinguistics, of social uses of languages, as far as I am aware (Chomsky 1984)

There is interesting work in sociolinguistics with implications for pragmatics (see for instance Brown and Levinson 1987). However, when it comes to explaining how speakers and hearers coordinate on the intended interpretations of utterances, sociolinguists have had little original to propose, and tend to rely on models of communication imported from elsewhere.

Pragmatics is now more commonly defined as the study of the context-dependent aspects of communication.[8] Here, Chomsky takes a more restrictive view of what counts as a specifically communicative use of language than many working in the field:

> I think the use of language is a very important means by which this species, because of its biological nature, creates a kind of social space, to place itself in interactions with other people. It doesn't have much to do with communication in a narrow sense; that is, it doesn't involve transmission of information. There is much information transmitted but it is not the content of what is said that is transmitted (Chomsky 1984)

That is, while he sees communicative uses of language as necessarily involving "the transmission of information", he excludes cases where the speaker does not intend to communicate "the content of what is said". As a possible example of such a case, he mentions phatic communion – "informal conversation conducted for the sole purpose of maintaining casual friendly relations, with no particular concern as to its content" (Chomsky 1980, 230). So a pragmatic theory restricted to explaining Chomsky's "communicative uses of language" would be mainly concerned with how speakers and hearers coordinate on "the content of what is said". This conception of pragmatics seems unduly restrictive: it is hard to see how a theory capable of explaining how contextual assumptions contribute to disambiguation, reference resolution, lexical adjustment and other pragmatic contributions to explicit truth-conditional content could fail to shed

light on other aspects of communication, both verbal and non-verbal, and this possibility is worth exploring.

In Grice's framework, unlike Chomsky's, what is communicated depends on an intention of the speaker, which the hearer infers from the fact that the utterance has been made, on that particular occasion, in that tone of voice, with that facial expression, and so on. It is therefore possible for a Gricean speaker's meaning to depart from the linguistically specified meaning of the sentence uttered (as in figurative utterances), or to include implicated social information unrelated to "the content of what is said", as in the following example:

> At a genteel tea party, A says *Mrs X is an old bag.* There is a moment of appalled silence, and then B says *The weather has been quite delightful this summer, hasn't it?* B has blatantly refused to make what he says relevant to A's preceding remark. He thereby implicates that A's remark should not be discussed and, perhaps more specifically, that A has committed a social gaffe. (Grice 1969/1989, 35).

As Chomsky points out, most utterances in face-to-face exchanges convey an element of social or relational information. Unless it is highly salient, as in Grice's example above, this is often abstracted away from in current approaches to pragmatics. To decide how such information should be dealt with in pragmatics, what we need is not more intuitions about what counts as a communicative use of language, but an explicit theory of communication.

Grice's own aim was not to build a theory of communication but to analyse the notions of sentence meaning and speaker's meaning. His definition of speaker's meaning was not intended to apply to all cases of overt intentional communication, but to pick out a subclass of cases in which the communicator can intuitively be described as *meaning that p* rather than merely *showing that p*.[9] This definition was much debated, and Grice himself pointed out a number of apparently insuperable problems with it (Grice 1969; Neale 1992). However, it is still widely seen as fundamental to modern pragmatics. As Stephen Levinson (2000, 12–13) puts it:

> A theory of communication has as its target the full scope of Grice's (1957) non-natural meaning … [M]eaning$_{NN}$ (or something of the sort) draws an outer boundary on the communicational effects that a theory of communication is responsible for.

According to Sperber and Wilson, quite apart from its internal inadequacies, it is a mistake to treat Grice's notion of speaker's meaning as fundamental to pragmatics, since the same pragmatic principles and mechanisms apply to the full range of cases of overt intentional communication. Their aim is to develop a theory of *ostensive communication,* where the communicator overtly displays evidence of her intention to inform the addressee of something and the addressee infers this intention from the evidence provided (Sperber & Wilson 1986/1995, 21ff; 2015). The evidence displayed may be verbal, non-verbal, or a mixture of both (Wharton 2009), and the information communicated – which is typically not a single proposition but an *array* of propositions – may include social or relational information that goes well beyond "the content of what is said" plus a few salient implicatures. Thanks to many years of collective endeavour by linguists, philosophers and psychologists, there is now considerable evidence for the existence of a dedicated mental system for ostensive communication,

which is arguably unique to humans (Scott-Phillips 2014) and which follows different trajectories in typical and non-typical development.[10]

4.2. What might a theory of ostensive communication look like?

Ostensive communication starts with an *ostensive act*: an act designed to attract the addressee's attention and focus it on the communicator's intentions. Common cues to ostension include catching someone's eye, touching them, pointing, showing them something, speaking and writing. Following Grice's suggestion that attempts at overt intentional communication create certain pragmatic expectations in the addressee, we assume that the goal of the comprehension system is to construct an interpretation that satisfies those expectations, based on clues provided by the communicator, together with contextual information. A major task for pragmatic theory is to describe those expectations and explain how they may be satisfied in the course of the comprehension process.

As suggested above (section 3.3), given that comprehension is largely a fast. automatic, unreflective process, it is natural to assume that it is carried out by a heuristic which does not process a great deal of information that could in principle be brought to bear[11] (Sperber & Wilson 1986, 45; on such heuristics see Todd & Gigerenzer 2000, 729–730); and that the system does not calculate for each item of information that could be processed whether it is worth considering, since this is generally prohibitively costly (Vriend 1996, 278; Todd & Gigerenzer 2000, 729–730; Allott 2008, 170–172). There must also be a rule that stops the search (Allott 2008, 179ff.).

Relevance theory proposes one such heuristic, guided by considerations of effort as well as of expected effect. This heuristic is designed to take advantage of a regularity in the domain of overt intentional communication – that the communicator, wanting to be understood, has done her best to put the addressee on the right track, so that the first pragmatically plausible interpretation to occur to him (i.e. the first to satisfy his pragmatic expectations) is the one she intended to convey. Sperber and Wilson argue that this means that the heuristic, on a first pass[12], can simply follow a path of least effort in constructing a hypothesis about the communicator's intended interpretation, testing candidate disambiguations, reference resolutions, lexical modulations, contextual assumptions and implications in order of salience or accessibility, and accepting the first interpretation reached which is acceptable overall (for discussion, see Sperber & Wilson 2002; Wilson & Sperber 2002).

A lot of interesting work on communicative development in the last twenty years supports this approach to pragmatics. For instance, there is evidence that pre-verbal infants are heavily engaged in mindreading (a prerequisite to ostensive communication) (Baillargeon et al. 2016); that they are sensitive to certain cues to ostension (Csibra 2010); that they respond differentially to ostensive and non-ostensive acts (Csibra & Gergely 2009; Schulze & Tomasello 2015); and that they form pragmatic expectations comparable to those of adults (Southgate, Chevallier & Csibra 2009). On the production side, there is evidence that infant pointing is used not only to inform or to request, but also to share emotions and attitudes, thus providing social or relational information (Tomasello, Carpenter & Liszkowski 2007); and that young children are adept at using lexical innovations as clues to their intentions in order to fill vocabulary gaps (Falkum, Recasens & Clark 2017).

As noted above, a major task for pragmatic theory is to describe the pragmatic expectations raised by ostensive acts and explain how they arise. Sperber and Wilson introduce a technical concept of *relevance*, defined in terms of *cognitive effects* and *processing effort,* which they see as central not only to pragmatics, but to cognition more

generally. They propose two principles of relevance: a cognitive principle (that human cognition tends to be geared to the maximization of relevance) and a communicative principle (that ostensive acts raise specific expectations of relevance not raised by other stimuli), and argue that the pragmatic expectations that drive the comprehension heuristic are expectations of relevance (see for instance Sperber & Wilson 2002; Wilson & Sperber 2002; Wilson 2017; 2019). The claim that ostensive communication is guided by expectations of relevance rather than expectations raised by, say, Grice's Cooperative Principle and maxims is precise enough to make testable predictions, and many of these predictions have been confirmed (see Van der Henst, Carles, & Sperber 2002; Van der Henst & Sperber 2004; Noveck & Sperber 2007). More generally, this approach to pragmatics has inspired an interesting body of research on a type of communication which is arguably unique to humans and which is likely to provide valuable insights into language use.

5. Conclusion

Chomsky's legacy for pragmatics comes mainly from his foundational contribution to cognitive science (reviewed in section 2 above), along with his view of the mind as a collection of "mental organs" and his work on grammar, which reveals a great deal about one of the major inputs to pragmatic processing (see Ariel 2008).

In a relatively new field such as pragmatics, every avenue is worth exploring. However, it seems to us that Chomsky's conception of pragmatics as the study of language use, and his view of the communicative use of language as just one among many possible uses, led him to miss the significance of Grice's work as pointing towards a new notion of communication as something which can take place independently of language but is vastly enriched when combined with language use.

There have been two major breakthroughs in pragmatics in Chomsky's lifetime. The first was the separation of pragmatics from semantics along broadly Gricean lines; this was at least partly inspired by Chomsky's distinction between competence and performance. The second was the recognition that pragmatics contributes much more to the truth-conditional content of utterances than is still acknowledged in much of semantics. While this second breakthrough is compatible with Chomsky's longstanding skepticism about a truth-conditional semantics for natural language sentences, it came about largely independently of his work, as pragmatic theorists explored the idea that pragmatic principles may guide disambiguation, lexical modulation, pragmatic enrichment and more (Wilson & Sperber 1981; Sperber & Wilson 1986/1995; Carston 1988; 1993; Recanati 1989; for an overview see Carston 2002). A third important development is currently under way with the investigation of ostensive communication in infants (see section 4); and there is room for many more.

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[2] Grice's term was 'utterer's meaning', where an 'utterance' is an overtly intentional attempt – whether verbal or non-verbal – to produce a certain cognitive or behavioural response in an audience.

[3] On the development of Chomsky's views on pragmatics, see Kasher (1992, 123). For discussion of Chomsky's notion of pragmatic competence, see Ifantidou (2014, 2–3).

[4] In this respect, Chomsky's notion of pragmatic competence is similar to Dell Hymes' well-known notion of 'communicative competence' (Hymes 1974, 75).

[5] See Glanzberg (this volume) and Collins (2017a,; 2017b) for further discussion of Chomsky's views on word meaning.

[6] Here Chomsky is commenting on Davidson 1986, and agreeing with his skepticism about a theory of interpretation. For discussion, see Allott 2019, 34.

[7] Their formulation is similar to later Chomsky: "a complete theory of this kind is not possible in principle; for to satisfy the above necessary condition it would be required that the theory represent ALL the knowledge speakers have about the world" (Katz & Fodor 1963, 178).

[8] On this view, linguistic semantics is the study of aspects of meaning that do not depend on context. Combining this with the now widely-shared but still controversial view that the vast majority (at least) of sentences don't encode propositions suggests that the encoded meaning of a sentence must in general be something like a framework for constructing a proposition, or a constraint on the truth-conditional content of literal utterances of that sentence.

[9] Grice equated speaker's meaning with what he earlier called "non-natural meaning" ("meaning$_{NN}$") in contrast with "natural" meaning", as in "Clouds mean rain" (Grice 1957; Neale 1992).

[10] On the development of relevance theory, see Sperber (2019).

[11] As far as we are aware, no alternative has been proposed, except for the skeptical view that there is no one underlying process.

[12] More sophisticated strategies will in general be needed to interpret utterances where the speaker is less than competent or intentionally misleading. (Sperber 1994; Mazzarella & Pouscoulous 2020)