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Gricean Communication and Cognitive Development

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Abstract

On standard readings of Grice, Gricean communication requires (a) possession of a concept of belief, (b) the ability to make complex inferences about others' goal-directed behaviour, and (c) the ability to entertain fourth order meta-representations. To the extent that these abilities are pre-requisites of Gricean communication they are inconsistent with the view that Gricean communication could play a role in their development. In this paper, I argue that a class of 'minimally Gricean acts' satisfy the intentional structure described by Grice, but require none of abilities (a)-(c). As a result, Gricean communicative abilities may indeed contribute to the development of (a)-(c) – in particular, by enabling language development. This conclusion has important implications for our theorising about cognitive development.

Key words: *communicative intentions, cognitive development, meta-representation, belief, ontogeny, phylogeny.*

Gricean Communication and Cognitive Development

I. Introduction

An intuitive idea is that communicative interaction plays a role in cognitive development. This view is at least implicit in the work of philosophers who have argued that only those who possess language can think (e.g. Davidson, 1975; Dennett, 1996). Since acquiring a language requires that children engage in communicative interaction, these philosophers are committed to the idea that communicative interaction plays a role in cognitive development. Call this the Cognitive Development View.

One problem for the Cognitive Development View is that, on standard Gricean accounts, engaging in communicative interaction itself presupposes a suite of developed socio-cognitive abilities including: (a) a concept of belief, (b) the ability to make complex inferences about others' goal-directed behaviour, and (c) the ability to entertain high orders of meta-representation. If this is right, then such abilities could not be acquired as a consequence of communication, since they are pre-requisites of it. If these interpretations of Grice are right, then with respect to (a), (b) and (c), the Cognitive Development View is false.

The goal of this paper will be to show that there is no inconsistency between the Cognitive Development View and Gricean accounts of communication. This is because there is a set of utterances that satisfy Grice's analysis, but which make weaker demands on the cognition required for communication than the challenging forms typically discussed in the literature. I call these acts 'minimally Gricean', since they may differ from 'full-blown' Gricean acts that do involve abilities (a)-(c). I offer a functionalist re-reading of Grice that shows that there could be subjects capable of minimally Gricean communication who nonetheless lack (a)-(c). In the final section of this paper I sketch some ways in which communicative interaction might – through the acquisition of language – make possible the acquisition of (a)-(c).

The arguments of this paper could be run with respect to cognitive development in either ontogeny or phylogeny. Here I focus primarily on phylogenetic development. This is partly because proponents of traditional readings of Grice have been willing to indulge intellectualised readings of Grice proffered in the context of infant but not great ape cognition. For example, Thompson (2014) defends the claim that infants could be Gricean communicators because even though Gricean communication requires sophisticated social cognition, infants possess such abilities. Tomasello (2008) and Scott-Philips (2014) adopt a similar view – while denying that great apes are Gricean communicators; and Sperber and Wilson (e.g. Sperber, 2000; Sperber & Wilson, 2002) appeal to uniquely human cognitive modules to explain children's facility for Gricean communication. I reject a pair of assumptions that all these views share. Crudely, these are the assumptions that Gricean communication is difficult, but that human infants – and by assumption our early hominin ancestors – possess(ed) the sophistication to overcome this difficulty. In contrast, I argue that Gricean communication is easier than others suppose, such that Gricean communicators need not be exceptional.

II. Grice's Analysis of Meaning

In his 1957 article 'Meaning' (reprinted in Grice, 1989), Paul Grice identified characteristics that he argued were necessary and sufficient for an action to be intentionally communicative. He started by distinguishing acts of communication proper, 'non-natural meaning', from cases of 'natural meaning'. Natural meaning, implicit in statements like *Those dark clouds mean rain*, picks out not a species of intentional action but an entailment relation: *if P, then Q.* Ordinarily, the onset of rain can be inferred from the presence of dark clouds in the sky. Unlike natural meaning, non-natural meaning is not an entailment relation: my uttering *'It's going to rain'* doesn't entail that it will. Rather, non-natural meaning is a property of purposive, intentional acts. Non-naturally meaningful acts are those that we intuitively place in quotation marks, as a way of indicating a speaker's communicative intention – for example, *By gesturing furiously he meant 'Run!'*.

On Grice's account, what distinguishes communicative from non-communicative acts is their intentional character. Communicative intentions have a feature not shared by other intentions – namely, their 'overtness'. Unlike non-communicative intentions they cannot be fulfilled surreptitiously, without being recognised by their audience. While Grice's attempts to capture this feature of communication proved controversial, a modified version of his account has been accepted (e.g. by Neale (1992) and, with some differences, Sperber & Wilson (1995)) and will be adopted here.

> A speaker *S* non-naturally means something by an utterance ***x*** if and only if, for some hearer (or audience) *H*, *S* utters ***x*** intending:
>
> (1) *H* to produce a particular response *r*, and
>
> (2) *H* to recognise that *S* intends (1).

In addition to acting with intentions (1) and (2), it's also necessary that the speaker should not act with any further intention:

> (3) that *H* should be deceived about intentions (1) and (2).[1]

In this analysis, clause (1) specifies the content of the speaker's message, which is closely related to *r* and can be recovered by discerning the intentions (or goals) with which the speaker uttered.[2] Clause (2) attempts to capture the sense in which communicative acts are overt. At least in the absence of deceptive intentions like those ruled out by (3), it is (2) that turns an ordinary intention into a communicative intention. I could exercise a first clause intention to make you drink non-communicatively (i.e. in the absence of (2) and (3)) – e.g. by adding salt to your food and surreptitiously moving your glass into your line of sight. Intuitively, however, this would not be a communicative act of the sort Grice aimed to characterise. For

[1] Although meaningful utterances need not be verbal, I refer to the speaker *S* and hearer *H*. This convenience allows me to distinguish between interlocutors on the basis of gender - *S*(he) and *H*(e).

[2] Others have distinguished between *intentions* and *goals*, where the former but not the latter implicate long-term planning (Bratman 1999; Butterfill 2012). Here I use the terms interchangeably, without supposing that either involves planning.

my act to be communicative, I would additionally need to bring it to your attention that my intention (1) is to get you to drink.

Clause (3) in this analysis requires that a speaker's intentions (1) and (2) are not deceptive; that her expressed goal, and her intention to make this goal overt are both sincere. It differs from Grice's original third clause, and instead adopts Neale's (1992) formulation.[3] This drops Grice's original third clause as unnecessary and inserts a new third clause to shore up the sufficiency of the analysis in the face of objections from Strawson (1964) and Schiffer (1972), and to rule out cases in which *S* is indifferent to whether *H* recognise her intentions.[4]

Some authors take clause (2) to be the key to understanding communication, and so describe it as the 'communicative intention' (Sperber & Wilson, 1995; Tomasello 2008; Csibra, 2010), to be contrasted with the 'informative intention' (Sperber & Wilson, 1995) or the 'social intention' (Tomasello, 2008) of (1). This nomenclature may mislead. Talk of the 'informative intention' gives the impression that Grice's analysis applies more to informative than imperative communication (a confusion of which Tomasello is guilty). Similarly, calling (2) the 'communicative intention' suggests that this intention is itself communicative – encouraging the idea that a Gricean communicator acts with a non-communicative ('social' or 'informative') goal, and a further goal to communicate that goal. This would make Grice's analysis circular. Therefore I individuate the clauses by number alone.

While the above account is not identical to Grice's, since the revisions retain the fundamental intentional structure elaborated in his 1957 paper, I refer to intentions with this intentional structure as 'Gricean'.

[3] See footnote 8 for discussion of Grice's original third clause.

[4] While cases of insincerity may sometimes exist, I take it that they can be handled derivatively – both on the conceptual level, and in onto- and phylogenetic development.

III. The Cognitive Pre-requisites of Gricean Communication

A long-standing problem is that Gricean analyses of meaning make communication cognitively difficult. Grice himself worried that his account specified 'too sophisticated a state to be found in a language-destitute creature' (Grice, 1986: 85). Ironically, this undermined a central goal of his project, which was to provide a non-verbal foundation for communication.

Worries about the cognitive pre-requisites of Gricean communication are pressing because developmental and comparative psychologists have recently used Gricean ideas in providing accounts of cognitive development. According to Tomasello (1999, 2008), Bloom (2000), and Gergely and Csibra (Csibra & Gergely, 2009; Csibra, 2010) among others, it's because pre-verbal children can attribute communicative intentions to others that they can acquire language and other forms of cultural knowledge. Furthermore, according to Tomasello (2008) and Scott-Phillips (2014), it's because humans but not other ape species developed the abilities required for Gricean communication that language emerged in phylogeny.

In what follows, I consider and reject three arguments for thinking that Gricean communication presupposes forms of cognition likely to be uniquely human: (a) the Belief Objection, (b), the Complex Inferences Objection, and (c) the Higher Order Thoughts Objection.

III(a). The Belief Objection

The Belief Objection has been developed in different forms by a number of authors (the most extensive treatment is Breheny, 2006; but see also Davidson, 1975; Dennett, 1978; Bennett, 1978). Since space constraints prevent a full exposition of their views, I reconstruct two versions of the argument – a global and a local version. Central to both versions is the idea that Gricean communication requires a concept of belief, and that this requires understanding that beliefs can be false.[5] This is problematic because empirical evidence suggests that young

[5] Breheny (2006) also offers a further version of the argument: that belief figures necessarily in the original third clause of Grice's analysis, as a component of the concept of *reason*. This issue deserves

children and non-human great apes may not grasp that beliefs can be false (e.g. Wimmer & Perner, 1983; Call & Tomasello, 2008). If so, then they could not be Gricean communicators.

The plausibility of a necessary connection between communication and the concept of belief turns on the idea that in attributing communicative intentions, interlocutors must recognise one another as subjects who represent the world, who have desires, and who act in light of their beliefs in order to realise their desires. Part of this understanding of other minds requires understanding that others can misrepresent the world, and so act in light of false beliefs. In Davidson's words, 'error is what gives belief its point' (1975: 168). If we fail to appreciate that a subject's beliefs about the world can be false, then we are not recognising them as subjects in the way that human communication requires.

This concern supports a global form of the Belief Objection: without subjects who recognise one another as capable of having false beliefs, there could be no Gricean communication at all. If additionally one thinks of communication as a process in which interlocutors communicate to inform others about the world, then a more local worry becomes apparent too: even if there could be Gricean communicators who lacked a concept of belief, they could not act with informative communicative intentions.

An argument for the local version of the Belief Objection is implicit in Grice's own writings (1957/1989) since he held that there are two utterance types: those that aim at belief production (informative acts), and those that enjoin others to act (directive acts). For the first class of utterance he favoured characterisation like:

> *S* uttered *x* with the intention that
>
> (1a) *H* should *believe* that *p*.

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further scrutiny – but since the clause in question is here rejected as unnecessary for communication, I do not undertake that here. See Thompson (2014) and footnote 9 for relevant discussion, though.

If *S*'s acting with a communicative intention requires acting with some goal to bring about *r*, and if *H*'s discerning *S*'s message requires that he attributes to her a goal with a content related to *r*, then were the concept of belief ineliminable from the specification of *r*, possession of that concept would be necessary for communication. If specifying the content of informative utterance types requires appealing to the contents of beliefs, then subjects lacking a concept of belief would seem incapable of informative communication – even if they were capable of producing directive communicative acts.

The Belief Objection can be resisted in both local and global forms. One approach would be to deny the objection on empirical grounds. Since Breheny's (2006) paper on the Belief Objection was completed, non-verbal paradigms for testing false belief understanding suggest that infants do understand false belief (Onishi & Baillargeon, 2005; Surian, Caldi & Sperber, 2007; Buttelmann Carpenter & Tomasello, 2009). Similar paradigms may one day provide evidence of analogous understanding in apes. However, the claim that there may be non-human Gricean communicators can be resisted on conceptual and not just empirical grounds. The global version can be overcome because there is a way of recognising others as subjects who represent and act on the world that does not require attributing to them possibly false beliefs. The local objection is false because the goals of communicative acts can be specified under a number of descriptions without violating the intentional structure that Grice identified. Consequently the concept of belief is rarely ineliminable from the formulation of *r*, even in the case of informative utterances.

There is a modest way of understanding others as subjects that does not require attributing to them a full-blown folk-psychology, including an understanding of false beliefs. For there may be subjects who do not understand that beliefs can be false, but who nonetheless understand one another as acting in order to fulfil their goals; who can track (under some description) what others have and have not seen; and who grasp that the goals with which others act are

constrained by what they have and have not seen.[6] Such subjects would likely be limited in their understanding of others minds – for example, they may fail to comprehend behaviour performed in light of false beliefs. However, they would be competent in many domains of social cognition. Indeed, such subjects likely exist. For while there is currently no evidence that chimpanzees are able to attribute false beliefs to one another (Call & Tomasello, 2008), there is compelling evidence that they do track others' perceptual states (Hare, Call & Tomasello, 2001; Call & Tomasello, 2008), and that they modify their behaviour in light of this. For example, subordinate chimpanzees prefer to eat food that has not been seen by a dominant individual. We also know that chimpanzees recognise the goals with which others act. For example, they can learn the right way to complete a novel tool use task simply by watching another trying and failing to complete that task (Call, Carpenter & Tomasello, 2005). Chimpanzees also successfully interpret ambiguous requests (Yamamoto et el., 2012). These findings show that they can figure out others' goals even when this requires making inferences over incomplete information. So even if chimpanzees do not understand that beliefs can be false, they can nonetheless make inferences about some types of mental state.

If interlocutors can attribute goals to others, and can track what they have and have not seen, this suffices to ground a conception of subjecthood that would support simple forms of communicative interaction. Additionally, such subjects could communicate with analogues of both the informative and directive utterances described by Grice.

In the case of directive utterances, speakers' intentions would aim at changing the goal-directed behaviour of their interlocutors. For example, I might utter the words 'Don't touch me!' intending:

[6] In some ways this discussion follows Butterfill and Apperly (2013), who argue that subjects might attribute 'belief-like' states to others by tracking which objects they have perceptually encountered. Here I remain open-minded about how exactly subjects represent the states that they attribute to others. Specifically, I do not claim (as they do) that belief-like states lack propositional character.

(1) that you *r*: stop touching me,

and additionally,

(2) that you recognise that I intend (1).

So long as (1) and (2) were performed without any deceptive intention (3), such acts would be Gricean in intentional character. However, the specifications of *r* in the first clause need require nothing stronger than that *S* think of *H* as an agent, capable of intentional, goal-directed activity and of grasping her (*S*'s) own goals. (What is required for *S* to satisfy (2) will be spelled out further, and without reference to a concept of belief, in sections 5-6.)

A similar point holds for informative communication, even though on Grice's original formulation this aims at inducing beliefs in others. One way to change others' beliefs is to change what they have and have not seen. Subjects who lacked a concept of belief but understood what others had and had not seen could produce utterances the goal of which was to direct their interlocutors' attention to unseen objects. This is presumably what happens when orang-utans and bonobos point to show an experimenter the location of a hidden tool needed to feed them (Zimmermann *et al.*, 2009). In that case, while Gricean accounts of communication have traditionally construed informative acts as consisting of cases like (1a), in which I point towards your feet, intending:

(1a) that you should *believe* that *p*,

there's no reason to exclude cases like (1b)-(1d):

(1b) that you should *see* that *p*,

(1c) that you should *attend to p*,

(1d) that you should *turn your eyes towards p*.

Here *p* need not always be a proposition. It could also be an object or an event that *S* took to be relevant to *H*'s activity. Although (1c) and (1d) have the surface character of directive utterances, they could be used with informative goals. Moreover, all are specified without reference to the concept of belief. (1d) does not even require attributing to apes what

Povinelli and Vonk (2006) have called a 'mentalistic' conception of seeing. It simply requires that *S* act with an intention to direct, through her utterance, *H*'s behaviour.

Of course, speakers do sometimes act with intentions like (1a) – for example, in cases of deception. For such utterances a concept of belief may be necessary. All that follows from this, though, is that individuals lacking that concept could not produce these utterances. In cases of comprehension communication might either break down, or proceed only imperfectly. So the existence of such cases is unproblematic.

Acting with communicative goals like those described here requires that subjects can track others' perceptual or conative states, and have intentions with respect to those states. However, this need presuppose no ability to understand and attribute false beliefs; and for the time being we can remain neutral about how complex subjects' representations of the tracked states are. So long as subjects can act with intentions concerning these states, though, the Belief Objection fails. These rebuttals of the Belief Objection hold even if it is accepted that communication works by producing beliefs in others. That's because communicators need not intend to produce these responses under descriptions that presuppose a concept of belief. On the Gricean analysis, the description with which *H* 's responses are picked out do not change the intentional structure of S's communicative act. However, since it is this intentional structure that is distinctive of communicative acts, differences in the conceptual apparatus with which a speaker's response is specified are irrelevant to the question of whether the acts in question are communicative; they pertain to issues of content and not form.

III(b). The Complex Inferences Objection

Proponents of the complex inferences objection (e.g. Bar-On (2013)) hold that Gricean communication requires making inferences about a speaker's communicative goals, and that this makes it too difficult for developing minds. Others have raised similar concerns in even stronger terms. For example, Davidson (1974) worried that since our primary knowledge of

others' minds comes from what they say, then in the absence of a common language, these minds would remain opaque to us.

Several solutions to this problem have been raised. For example, Green (2007) and Bar-On (2013) argue that a class of 'expressive' behaviours – including gaze behaviour, emotional expressions, and emotionally charged body postures and intonations – give us direct, non-inferential knowledge of others' mental states. Such behaviours can make some acts of intentional communication more easily interpretable than others, by providing rich evidence for a speaker's communicative intentions (Moore, 2013b). Additionally, Sperber and Wilson (1995; 2002) propose the existence of a cognitive module, unique to humans, that processes possible interpretations of utterances at the sub-personal level and generates interpretations based on their 'relevance to' the individual.

Sperber and Wilson posit a relevance-processing module to explain the human facility for interpreting linguistic utterances in conditions where what speakers say is poor evidence for what they intend to communicate. Here issues of interpretation arise because humans use the same sentences to communicate a wide variety of messages. I take no stand on whether humans possess such a module here. However, the ability to participate in Gricean communication does not presuppose its existence – because while humans excel at interpreting a wide range of utterances, there could also be Gricean communicators who are able to interpret successfully only a small set of very simple communicative goals.

Subjects with a communication system like this one might be very limited in the range of goals that they could entertain – perhaps acting with and being able to interpret goals with contents no more sophisticated than 'Want!' or 'Groom me!' or 'Fight!'. Moreover, they might be very limited in the conditions under which they could identify others' communicative goals. For example, they might interpret each other easily only where utterances are used in fixed and predictable ways, or where they are closely tied to accompanying expressive states – like

presentations of relevant body parts, or begging gestures produced in the context of a hungry looking gaze to the target object. Alternatively, interpreters may rely on environmental information to facilitate interpretation – like expectations about which of the possible referents of a begging gesture a subject is likely to want. Again, there are empirical reasons for thinking that such subjects actually exist. For example, chimpanzees are typically (although not invariably) poor at understanding pointing (Tomasello 2006) – most likely because interpreting points requires difficult pragmatic inferences (Moore, 2013b). However, they produce and understand a range of gestures for one another. In many of these cases, comprehension is likely to be facilitated by a range of 'evidence-rich' accompanying states (Moore, 2013b) – like facial expressions, or erect genitalia – which facilitate interpretation. In at least some cases, though, they succeed in making more abstract inferences about a speaker's goals. For example, where chimpanzees know what tool a peer needs to retrieve food, they respond appropriately to requests produced using an ambiguous begging gesture (Yamamoto et al., 2012). This suggests that they can, in at least limited contexts, make inferences about an interlocutor's communicative goal.

Whether or not apes grasp intentions with a Gricean structure, there could be individuals who do – but who can act with and attribute only a very limited set of goals. Such creatures would not be incapable of Gricean communication; only limited in their practice of it.

III(c). The Higher Order Thoughts ('HOT') Objection

A third objection to the Cognitive Development view is the Higher Order Thoughts objection. On standard explications, Gricean communication requires entertaining a complex meta-representation. On Sperber's (2000) influential view this is a fourth order meta-representation. For example, were you to point to a patch of earth near my foot with the intention of informing me that we could dig there for tubers, understanding your utterance would require entertaining the following:

fourth order: You intend

third order: That I believe

second order: That you intend

first order: That I believe

representation: That there are tubers for which we could dig.

The first and second order meta-representations, in conjunction with the represented content, correspond to a Gricean first clause intention in which the *S* intends for *H* to believe that there are tubers. The third and fourth orders correspond to the second clause intention that *H* recognise *S*'s first clause intention.[7]

This formulation presents several problems to the Cognitive Development view. First, even if the appeal to belief in the first order can be replaced by an appeal to a weaker concept, the same may not be true of the appeal to belief in the third order. In that case, the belief objection would recur. Second, even if S's communicative goal could be specified without reference to belief, the requirement that communicators grasp fourth order meta-representations may be insurmountable.

III(d). Overcoming the HOT Objection

Sperber (2000) has argued that the HOT objection is unproblematic, because humans possess an innate endowment for processing higher order meta-representations that means that we do it with ease. However, his modular solution is not wholly satisfactory – because to posit a modular solution is not to explain how the problem is solved, but simply to stipulate that at some point in our evolutionary history it was. Moreover, the claim that humans find meta-representations easy is empirically unsupported. For example, Liddle and Nettle (2006) found that 10 and 11-year-old children could accurately track the contents of third order meta-representations slightly above chance, but fourth order meta-representations only at chance; and Perner and

[7] Since speakers need not entertain the third clause of the analysis proposed at the outset, it places no further demands on the cognition of communicative intent. Hearers would benefit from being receptive to the sincerity of speakers, but it matters not if they could sometimes be fooled.

Wimmer (1985) found that 6-year-olds but not 5-year-olds could reason about second order beliefs. While it may be that new testing methods could show robust meta-representational abilities in younger children, there is currently no evidence that pre-verbal children can entertain the meta-representations that traditional accounts of Gricean communication require; and so children and apes alike should be equally incapable of acting with and understanding Gricean intentions. Since young children are evidently competent communicators, an alternative solution – that Gricean communication does not require complex meta-representation – is therefore worth considering. In what follows, I argue that there are ways of uttering that are sufficient for acting with Gricean intent, but that implicate only weaker meta-representational abilities.

A first point here is that Sperber's example of an informative utterance can be reformulated as a meta-representationally less demanding but functionally analogous directive. Suppose, for example, that you point to get me to look at the ground, so that I will see the tubers for myself. Here, successfully understanding your communicative intention would require that I entertain the following thought:

third order:	You intend
second order:	That I believe
first order:	That you intend
representation:	That I look at (or attend to) the ground.

To make this revision is just to acknowledge that in many simple cases informative utterances can be recast as functionally analogous directives. Comprehending such utterances requires only a third order meta-representation. The point is relevant because simple Gricean communicators need not be capable of all varieties of informative communication. There could be subjects who communicate only to direct one another's behaviour, including their gaze or attention (as in the orang-utan and bonobo pointing behaviour previously described).

In what follows, then, I try to show that Gricean communication involves the cognition of fewer than three orders of meta-representation. I adopt an indirect strategy. First, I sketch functional constraints that are sufficient for intentional communication. Then I argue that these constraints correspond to the intentions specified in Grice's account of non-natural meaning. Finally, I argue that the functional constraints on acting with communicative intent can be met by individuals who lack the meta-representational abilities often thought necessary.

IV. A Functional Model of Gricean Communication

One way to better understand the cognitive pre-requisites of Gricean communication would be to develop a functional model of the varieties of action and cognition that intentional communication requires. Since all communicators are fallible, these abilities need not be immune to failure in non-standard cases. The model need only specify a set of cognitive abilities that would *in general* suffice for acting with and grasping communicative intent.

Suppose that we are part of a group of early hominin hunter-gatherers out searching for tubers, when I come across a patch of ground that looks promising. Suppose too that you are carrying the tool that I need to dig. Since you are some distance away and language has not yet evolved, I need to find some non-verbal way to get your tool.

Strategy A

One way I could get the stick is by approaching and taking it. Since this causally efficacious strategy isn't dependent upon communication, it might be useful for uncommunicative individuals. However, doing everything oneself can be impracticable; and my taking the stick might antagonise you. A less effortful alternative would be better.

Strategy B

Suppose I can take it for granted that if you see the tuber roots, you'll hand me the tool. I could try to get you to look at the ground by standing over the tubers and pointing downward, with the intention that you look at the soil by my feet. Since pointing is causally inefficacious, it won't get the tubers from the ground itself. However, if you see me, you might infer that I'm pointing because there are tubers. If you don't look at me, though, my gesture will achieve nothing. In that case, a pre-requisite of pointing successfully will be getting you to look at me.

Strategy C

An alternative strategy would also risk failure. Suppose I grasp that a pre-requisite of my gesturing is that you to attend to me. Now I might jump up and down or make some noise, with the intention of getting you to look at me. However, even if this gets your attention, it might still fail. For one thing, my behaviour may not make it clear that I am acting *in order* to get you to look at me, and so seem to merit no response. Alternatively, it might make it evident that I want a response from someone, but without specifying whom. For my act of attention soliciting to work, it should be apparent that the person I want to respond is you.

Strategy D

A better approach would be to solicit your attention in a manner that made it clear that I want something from you. But now a different problem becomes clear. For while I might succeed in having you grasp *that* I want you to respond, unless I also give some indication of *how* I want you to respond, I won't get the tool. In that case, I should also do something to specify the response that I'm intending to solicit.

Strategy E

A final strategy would combine the strengths of B and D. I might both solicit your attention with the intention of bringing you to grasp that I want something from you, and then point as a means of getting you to inspect the ground by my feet. Whereas in Strategy B you were

oblivious to my pointing, now I go out of my way to commend my gesture to your attention – because I grasp that if I don't address my performance to you my chances of success diminish.

In many cases, I suggest, Strategy E would be successful: it would suffice to indicate both that I want something from you, and what it is that I want. What would explain my recourse to this strategy would be my recognising that the fulfilment of my goal is dependent upon your uptake, since my gestures would be causally inadequate to fulfil my goal without your intervention. Thus my act of attention soliciting functions – in at least many cases – as a functional pre-requisite of successful communication.

In addition to being functionally sufficient, someone who pursued Strategy E would also satisfy the Gricean criteria for intentional communication. In the case above, it is descriptively true of me that I acted intending:

(1) That you look at the ground by my feet, and

(2) That you recognise that I intend (1).

(1) is true of me because I produced my point with the intention of bringing you to grasp that there are tubers. (2) is true because, by soliciting your attention before pointing, I went out of my way to address my gesture to you, so as to indicate that this gesture was performed to solicit a response from you. This fulfils the overtness requirement on communication. Given that (1) and (2) are together sufficient for Gricean communication (assuming no further deceptive intention (3)), then Strategy E is sufficient for enacting Gricean intent.

This conclusion may need further selling. The key claim is that when an agent deliberately draws attention to an action she is performing, she intends for others to know what it is that she is doing. This gives us a way to think about Grice's second clause in a cognitively undemanding way. For if an agent *S* deliberately performs one action *A* in order to draw *H*'s attention to her performance of a second action *B*, and performs *B* in order to achieve some goal *r*, the performance of A would make B overt. Thus, in performing *A* to draw *H*'s attention

to her performance of *B*, *S* would intend *H* to grasp her intention to elicit from him *r*. In that case, so long as she did not act with any further intentions that would undermine (1) and (2), it would be analytically true of S that she was acting with communicative intent.

Strategy E is sufficient but not necessary for acting with Gricean intent. There may be cases where, once I have won your attention, it will be clear what I want. Here Strategy D might suffice. In other cases, if I already have your attention, Strategy A might suffice. The claim is therefore not that (i) speakers must perform the combinations of actions described above in order to communicate. Nor is it claimed that (ii) humans never act with intentions like those described by Sperber (2000). The claims of this paper are consistent with the falsity of both (i) and (ii). I claim only that the actions described in Strategy E would, ordinarily, suffice for utterances to be Gricean in their intentional structure.[8]

V. Elaborating the Functional Reading

The pair of acts described in Strategy E can be described as *sign production* and *acts of address*. These enact, respectively, the first and second clauses of a Gricean intention.[9]

In most cases, signs will be bear the content of a speaker's message. In producing signs, speakers articulate the responses that they intend to solicit from their audience, and thereby enact their first clause intentions to elicit from *H* some response *r*. Typically signs are words or gestures, but they can also include facial expressions and other body parts; and may be

[8] This characterisation also provides a way to think about Grice's original (but now rejected) clause (3):

(3) *H* should fulfil (1) on the basis of his fulfilment of (2),

If we think that (2) expresses a way of addressing an utterance to its intended interlocutor, Grice's original (3) can now be read as demanding that *H* set out to infer *S*'s communicative goal because he recognises himself as the addressee of her utterance. This is consistent with the rationality requirement in Grice's original (3) – although space constraints prevent me from developing this point here.

[9] Gómez (1994, 2007) makes a similar distinction.

distributed over a combination of these things.[10] Even signs that have an established communicative function need not always be used communicatively – e.g. if they are not uttered with Gricean intentions.

Acts of address are normally marked by the performance of one or more type of *ostensive cue* – such as ostensive eye contact, directed-speech, and name-calling (Csibra, 2010). An agent might perform such an act solely to engage another's attention; for example, just for the sake of being subject to his gaze. As such, acts of address need not always be communicative.[11] However, because such acts serve to engage another's attention, they can be used to address signs to their intended audience. In practice, although we may not be aware of doing so, we direct our utterances using a variety of acts of address, and we recognise just as easily when they are doing the same. Addressing another, and recognising when one is being addressed, are basic features of our direct, embodied engagements with others, in which we address our attention to and solicit the attention of other subjects. This address does not require understanding that beliefs can be false, but only a more primitive kind of purposive activity – namely, the deliberate soliciting of another's attention in order to make 'attention contact' (Gómez, 1994). This is present not only in very young children, but also in all great apes species, dogs, and likely in others species too.

Ordinarily, when *S* performs an address to direct *H*'s attention to her production of a sign, she will make its performance public between them. This puts both in a position to infer that they have common knowledge of the speaker's act (Lewis, 1969; Schiffer, 1972; Campbell, 2005) – such that, for example, each could infer that *S* knows that *H* knows that *S* uttered *x*, and so on. However, *S*'s addressing herself to *H* in this way does not require that either interlocutor

[10] Non-intentionally produced bodily states can also function as vehicles of a speaker's message, so long as they are intentionally shown to an audience (Moore, 2013b).

[11] This is a weaker account of the function of ostensive cues than Gergely and Csibra (Gergely, Király & Egyed, 2007; Csibra, 2010). See Moore, Liebal & Tomasello (2013) and Moore *et al*. (2015) for discussion.

articulate – or even be able to articulate – the many iterations of knowledge of *S*'s utterance that thereby become available to them. They need only stand in such a relationship (e.g. the right sort of visuospatial relationship) that they, or an appropriately enabled individual, could make these inferences. It may therefore be that some individuals – young children and animals in particular – could stand in such relations without being able to represent the structure of the knowledge available to them.[12] This would not undermine the functional contribution of *S*'s address. It would just leave such interlocutors less able to reflect on the nature of their interaction.

Once *H* recognises himself as the addressee of an utterance, it will fall upon him to work out why *S* wanted him to attend to what she gestured or said. This will require attributing to her an intention with a content related to *r*. Because a speaker's utterance will not suffice to fulfil her goal unless her intended audience perceives it, properly addressing signs will often be a pre-requisite of making them work. Hearers may attempt to figure out what *S* wants only because they take themselves to be the addressee of her communicative act.

VI. Meta-representation Revisited

The account of communicative sufficiency defended here has implications for the cognitive complexity of intentional communication. Where communicative intentions are enacted by the production of signs in conjunction with an act of address, the meta-representational burden of communication is reduced, since a speaker can now act with two functionally distinct, although closely related intentions.

[12] This formulation of the publicity requirement is weaker than Lewis's (1969) account of common knowledge, and weaker than Grice's later (1987) formulation of his analysis. E.g. Lewis requires that interlocutors themselves are able to make the relevant inferences about others' mental states – such that young children and animals could not possess common knowledge. See Gómez (1994), Campbell (2005), Breheny (2006) Wilby (2010) for formulations more similar to mine; and Moore (2010, ch.6; 2013a) for my own discussions of Lewis's view.

Using the same example as above, *S* might act with the following intention:

first order: *S* intends that

representation: *H* attend and respond to her gesture.

In this case the gesture in question is a point, through which S would intend:

first order: *S* intends that

representation: *H* look at the ground by *S*'s feet.

Grasping this second representation requires inferring the intention with which *S* produced her gesture. Since the address continues to 'refer' to the sign by virtue of directing it to *S*'s intended audience, the communicative act therefore retains its 'embedded' character. However, since the address refers not to the first clause intention itself, but to the purposive action through which this intention is expressed, one can now entertain the first and second clause intentions independently: first by entertaining the address of the sign, and subsequently by grasping the purpose with which this sign was addressed. Furthermore, what was originally specified as a further appeal to belief in the third order of Sperber's formulation, can now be replaced by *S*'s intending that *H* attend and respond to her utterance, since this is what is required to satisfy *S*'s act of address. Neither *S*'s intending that *H* attend and respond to her utterance, nor his attributing to *S* the intention that he should so respond requires that either understand the possibility of false belief. There is therefore a way in which *H* can understand *S*'s second clause intention that seems not to turn on understanding that beliefs can be false.

On this formulation, since speakers need not represent the highest order of their own intentions ('I intend that' – shown under erasure), the production of directive acts requires no meta-representational abilities at all:

~~first order: I intend that~~

representation: You attend and respond to my gesture.

And subsequently:

~~first order: I intend that~~

representation: You look at the ground by your feet.

The comprehension of communicative intent in the second personal case poses the same cognitive demands as the cognition of the third personal case, since recipients of a communicative act must additionally grasp the first order intention ('You intend that').

first order: You intend that

representation: I attend and respond to your gesture.

And subsequently:

first order: You intend that

representation: I look at the ground by your feet.

Since hearers must additionally infer the content of S's goal, acting with communicative intent is cognitively less demanding than representing others' communicative intentions. Nonetheless, there could be groups who produced and understood directive cases of Gricean communication without being capable of grasping any more than first orders of meta-representation. Via the act of address, the overtness requirement on communication is nonetheless secured.

Grasping pairs of first order meta-representations is still cognitively demanding. However, chimpanzees seem to possess meta-representational abilities sufficient for at least first order meta-representation (Call & Carpenter, 2001; Call, 2010; Beran, Smith & Perdue, 2014). Additionally, the cognition of acts of address may be even simpler than suggested – because their production and comprehension is implicit in intuitive and well-rehearsed schemas of bodily interaction.

Acting ostensively is simply a way of knowing how to address oneself, and one's actions, to another. That is a matter of knowing how to use one's body to solicit another's attention, and guide it onto what one is doing. Recognising an address is simply a matter of knowing when an interlocutor is soliciting one's attention; and, in the communicative case, of using that solicitation as a means of addressing a further purposive action to one's attention. While such skills may be a pre-condition of the ability to engage in intentional communication, they are

also part of a background of bodily engagement that is fundamental to and pervasive in our interactions with one another. For the most part, the act of producing or recognising an act of ostension is therefore not likely to be explicitly represented. Rather, it is implicit in schemas of bodily action of which speaker and hearer need scarcely be aware, at least until their interaction breaks down. The rest of the time, they need only explicitly entertain the contentful aspects of the speaker's message to communicate successfully.[13] This 'explicit' entertaining need be articulated only in the act of signalling: speakers not need articulate their intended message independently of producing the sign that expresses it.

To explain an agent's ability to address her gestures in this way, we need not suppose that she could herself explain why she had done as she did. (This criterion would clearly be too demanding for apes and infants.) Instead we need only suppose that the agent has belief-desire pairs that guide her goal-directed communicative behaviour, and that could serve as premises in a practical syllogism reconstructing her behaviour.[14]

If this analysis is right, then attributing communicative intentions to others requires no more than entertaining a pair of first order meta-representations of the goals that *S* has with respect to *H*. By the criteria elicited in the previous sections, though, the acts in questions retain a Gricean structure. Furthermore, in many respects relevant to communicative competence, they would be indistinguishable from those capable of grasping higher order meta-representations. The 'HOT' objection is therefore undermined. In conjunction with the shortcomings of the Belief Objection and the Complex Intentions objection, this should

[13] Over time acts of address may also become ritualised, and so acquire properties of natural meaning – such that eye contact reliably indicates to others that a speaker has a communicative intention. This would make comprehension even easier. (I thank Santiago Amaya for this point.)

[14] For an account of a subject's acting for reasons that is consistent with this, see Arruda & Povinelli (in press) on 'reason directed behaviour'.

undercut reasons for thinking Gricean communication inconsistent with the Cognitive Development View.

VII. A Minimal Framework for Gricean Communication

The foregoing suggests that there could be a class of individuals who can act with and attribute to others a class of minimally Gricean communicative intentions despite possessing only limited socio-cognitive abilities. The subjects in question might possess only a limited range of gestures, used with only very simple dialogic goals – for example, to make requests for affiliative contact ('Groom me!'), or to request food from others. Rarely such gestures might also be used in triadic interaction – for example, to request distal objects, or to point out potentially unseen prey. They need not be used in combination with other gestures. Nor need they presuppose any particularly sophisticated folk psychology – just a basic understanding of others' purposive activities and desires, operating in conjunction with some tracking what others had or had not seen. Such a communicative system might be very simple. However, the goals could still be specific enough to generate satisfaction conditions differentiating them from other gestures, and to provide clear criteria for success and failure in comprehension (Moore, 2014).

In the system described above, gesturers would count as Gricean if they produced their gestures with goals in mind, and intending that others recognise that they were acting with these goals. The latter requirement would be met if subjects recognised that for gestures to work they need to be addressed to others' attention, and if they acted intentionally to realise this state. Subjects with insight into the nature of Gricean communication might exhibit this by different patterns of response in communicative breakdown. For example, misunderstood acts might be elaborated with the production of different but analogous signs, whereas unseen acts would be corrected by redoubled efforts to solicit the interlocutor's attention (Moore, 2016).

In cases like these, there are no grounds for denying that communicators are (minimally) Gricean. Moreover, such a system of communication constitutes a foundation from which further socio-cognitive abilities could develop.

VIII. Communication and Cognitive Development

If Gricean communication is less cognitively demanding than others have supposed, we can entertain the reversal of a widely held account of cognitive development. Rather than taking it for granted that developments in social cognition enabled communication, we can consider whether communication might have enabled or facilitated developments in social cognition. In the next paragraph I develop this point with respect evolution – but the same argument could be run for ontogenetic development.

On standard accounts of Gricean communication, the cognitive mechanisms that support intentional communication presuppose socio-cognitive abilities that our nearest non-human cousins – chimpanzees and bonobos – lack (Sperber, 2000; Tomasello, 2008; Scott-Phillips, 2014). As a result, before our early hominin ancestors could become Gricean communicators, they needed to undergo a socio-cognitive revolution: developing a suite of skills for meta-representation, false belief understanding, and the ability to make complex inferences about others' goals. These abilities are thought to have emerged as the result of a competitive arms race that led to selection pressures for mind-reading abilities that allowed competitors to outwit and outcompete one another (Byrne & Whiten, 1988; Sperber, 2000). Since Gricean communication became possible only after this revolution, it could not have contributed to its occurrence.

While this explanation has been widely accepted, an alternative has been thought to be a non-starter (Sperber, 2000). This is the possibility that the abilities (a)-(c) often thought necessary for Gricean communication were themselves enabled – or at least greatly facilitated – by language. On the account defended here, it is possible to envisage this situation.

VIII(a). Language and Meta-Representation

One possibility is that while we possess some basic (perhaps first order) meta-representational abilities even in the absence of language, these meta-representational abilities are characterised by 'signature limits' (Apperly & Butterfil; Apperly, 2011) that make them adequate only for the representation of simple social relationships. Beyond this limited system, our capacity for more complex meta-representations may be a direct consequence of the recursive, productive elements of language. For example, suppose that without language, our ancestors could entertain propositions of the form:

p,

where *p* could be filled by any simple (non-meta-representation involving) proposition. Suppose that they could initially also grasp simple epistemic markers of the form:

X saw that […].

These might be combined to make propositions of the form:

X saw that *p*.

At some point in our evolutionary history, suppose that language-users developed linguistic tools for representing both simple propositions and further epistemic markers. Now these might be combined in new ways. For example:

Z saw that [*Y* saw that [*X* saw that [*p*]]].

In this way, the development in language of tools for recursively representing propositions and their accompanying attitudes might have enabled language-users to represent relationships more complex than were previously possible - either by making more tractable representations that were previously on the boundary of what could easily be represented, or by enabling such representations for the first time. The simple innovation of a new format – linguistic representation – that allowed for the iterative combination of its parts might itself have enabled our capacity for complex meta-representations.

In this case, at least some aspects of the human ability for meta-representation might be parasitic upon language. While Sperber (2000: 122) has rejected this possibility on the grounds that even pre-linguistic human communication is 'metarepresentational through and through', if he has overstated the meta-representational complexity of intentional communication, then his argument against the language-first hypothesis no longer holds.

VIII(b). Belief Cognition and Intention Understanding

A similar argument can be run for the development of a concept of belief. Apperly and Butterfill (Apperly & Butterfill, 2009; Apperly, 2011) argue that some aspects of belief reasoning – for example, the tracking of which individuals have seen particular objects – are processed by fast and efficient but limited cognitive modules shared by both humans and non-human animals. In addition, they hypothesise that older humans possess a second, more flexible system for reasoning about belief that is slower and cognitively more demanding, but which is enabled – at least in part – by language development.

The same language development might also enhance subjects' abilities to attribute intentions. As Davidson (1974) argued, our capacity to read others' intentions often turns on our understanding of their utterances – because in uttering subjects provide evidence of their thoughts and goals. As language develops, so do the possibilities of linguistic expression available to speakers. Hearers can use this new evidence to better interpret speakers' minds. Empirical evidence already shows that non-human great apes possess at least a rudimentary understanding of goal-directed activity (e.g. Call, Carpenter & Tomasello, 2005). If our early hominin ancestors possessed the same understanding, early forms of linguistic representation might have built upon this, to allow increasingly refined representations of purposive activity.

This sketch of the possible origins of some aspects of intention-reading, meta-representation, belief representation does not require us to deny that abilities (a)-(c) could have developed in

the absence of language and communication. However, it enables us to re-imagine a widely accepted account of cognitive development in human evolution.

IX. Concluding Remarks

This reconsideration of the development of social cognition in human phylogeny is made possible by the disenchantment of a strain of intellectualism in traditional accounts of Gricean communication. According to the view defended here, a class of minimally Gricean acts can be produced and understood by subjects who lack a concept of belief, who cannot make complex inferences about others' intentions, and who are unable to entertain fourth order meta-representations. These forms of communication are possible for subjects capable of entertaining only first order meta-representations, who lack any understanding that beliefs can be false, and who can entertain and identify in others only a limited range of goal directed behaviours. To the extent that the intentional structure of the acts remains consistent with the analysis of non-natural meaning identified at the outset, this communication is at least minimally Gricean; even though less complex than our own. Recognising this should undermine the idea that our human forms of social cognition must have emerged in evolutionary history prior to the advent of Gricean communication. On the contrary, our cognitive development may have resulted from it.[15]

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