

# Meaning and Mindreading

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**Abstract:** In this article, I defend Neo-Gricean accounts of language and communication from an objection about linguistic development. According to this objection, children are incapable of understanding the minds of others in the way that Neo-Gricean accounts require until long after they learn the meanings of words, are able to produce meaningful utterances, and understand the meaningful utterances of others. In answering this challenge, I outline exactly what sorts of psychological states are required by Neo-Gricean accounts and conclude that there is sufficient evidence that these types of psychological states are present in and capable of being understood by the children in question.

## 1. Introduction

Since H. P. Grice (1957) first published his penetrating analysis of speaker meaning in terms of complicated communicative intentions, theorists have tried to generate examples of meaningful behavior that lack such intentions. In fact, a cottage industry emerged to challenge the necessity of his conceptual analysis of speaker meaning (as well as the sufficiency of the analysis, for that matter), leading Schiffer to first defend the analysis as part of the semantic program he dubbed ‘Intention-based Semantics’ (1972, 1982), then demolish it in his later work (1987). Despite the fact that these more traditional challenges to the necessity of this analysis have been answered fairly adequately by fine-tuning the analysis in various ways,<sup>1</sup> Intention-based Semantics—as a program to explain linguistic meaning via an analysis of speaker meaning—is dead.<sup>2</sup>

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<sup>1</sup> The best summary of these attempts is to be found in Avramides (1989). She separates the counterexamples into two classes—those that question what type of response is required of the audience, and those that question whether there is an audience at all—and shows how a Gricean should adjust the analysis of meaning to withstand these challenges. If the conceptual fine-tuning is done, I believe that the analysis can be salvaged. Anyone interested in these details should consult Chapter Two of Avramides’ book (esp. §3).

<sup>2</sup> Schiffer (1987) tries to kill *all* versions of Intention-based Semantics, but he is most credited for demolishing the very program he valiantly defended—the reductionistic Gricean version, in which literal meaning was explained in terms of conventional signals for speaker meanings, and speaker meanings were analyzed in terms of intentions and other propositional attitudes. Few, if any, still defend that version of Intention-based Semantics. Many others, however, still believe that all questions about literal linguistic meaning reduce to questions about the

Nevertheless, Neo-Gricean accounts of communication constitute much of the current work on the interface between natural language semantics and pragmatics. These Neo-Griceans, in updated parlance, seek to identify the critical role that 'Theory of Mind' (or 'mindreading') might play in these linguistic domains. Not surprisingly, these accounts have suffered a fate similar to the traditional Gricean program described above—they have been subjected to challenges about the central role that communicative intentions play in their accounts of language and communication. In this article, I will consider the specific objection that Neo-Gricean accounts cannot explain the development of linguistic communication in children. According to this objection, children are incapable of understanding the minds of others in the way that Neo-Gricean accounts require until long after they learn the meanings of words, are able to produce meaningful utterances, and understand the meaningful utterances of others. In answering this sort of challenge, I will outline exactly what sorts of psychological states are required by Neo-Gricean accounts and conclude that there is sufficient evidence that these types of psychological states are present in and capable of being understood by the children in question. I will expose flaws in current attempts to understand how the capacity to understand, predict, and explain the intentional behavior of others is related to our linguistic competence, and demonstrate the deep connection between that capacity and meaning.

## 2. Developmental Concerns

Theorists object to Neo-Gricean accounts for many reasons, most of which have little to do with developmental concerns. There are at least four different types of such objections, and individual theorists may straddle these types, or jump amongst them from one point in time to another (I leave it as an exercise for the reader to see how various theorists combine these worries into each theorist's own particular poison for Neo-Gricean accounts). The general types can be grouped as follows:

- Davidsonians, Wittgensteinians, and Sellarsians think that Griceans have things backwards. According to these theorists, as disparate as their other commitments might be, it is not the case that we (as theorists or as communicators) use a consideration of mental states to come to understand linguistic communication or meaning, it is that we use a consideration of linguistic communication or meaning to come to understand mental states.
- Semantic minimalists think that in order to keep semantic content distinct from pragmatic content (and to keep semantics distinct from pragmatics more generally), we must minimize to the greatest extent possible the number of context-dependent expressions that might require a consideration of the

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meaning of psychological states, as articulated, for example, in Fodor's (1987) psychosemantic program.

communicative intentions of the speaker by the interpreter in order to determine the semantic content of an utterance of that expression. Neo-Gricean accounts do not maintain this boundary fastidiously enough and open up the door to a wholesale collapse of semantics into pragmatics.

- Others stress the embodied, embedded, extended, and enactive nature of our mentality, so the Neo-Gricean accounts strike them as both too theoretical and individualistic, and too intellectualized and unembodied.
- Other theorists argue that Neo-Gricean accounts are too complicated, and that some other more parsimonious account should be preferred, all things being equal.

In this article, I will not attempt to challenge or address all of these broad methodological or theoretical issues with Neo-Gricean accounts. Since many Neo-Griceans spend their time trying to address simultaneously all of these shifting worries, progress has been slow and success against one type of objection is often simply met with a restatement of one of the other concerns. Although the ontogenetic account offered here addresses (at least indirectly) each of these concerns, the goal here is simply to show that the issues about development are not as devastating as they are typically made out to be. Hence, I will be addressing worries of the following form, as clearly articulated by Breheny (2006, p. 74):

Prominent accounts of language use and human communication face something of a dilemma. The dilemma arises because it is assumed (a) that basic communicative situations essentially involve propositional attitude-like states of the participating agents and (b) that competent language users have the conceptual abilities to represent agents as being in such states and make folk-psychological inferences about agents so represented. These assumptions conflict with one of the more robust findings in developmental psychology: that children below the age of four years do not possess these abilities. The conflict arises because it is widely agreed in research on language development that children below the age of three years are competent language users and communicators in the basic sense.

Of course, one can still object that Neo-Gricean accounts suffer from further worries, based on one's differing theoretical commitments, but the issues about development should be handled in their own right. So, I will aim to show that *if* the Neo-Gricean accounts are right about how children communicate and use language in this basic sense, children should be able to understand the minds of others in a particular way, and that they do understand the minds of others in that way, despite the fact that these accounts reverse the explanatory order preferred by some, complicate the semantic-pragmatic distinction, and make early communication seem overly intellectualized or overly complex.<sup>3</sup>

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<sup>3</sup> These sorts of developmental worries have been raised directly by Breheny (2006), Carruthers (1996, though he since has changed his views on this), Garfield, Peterson, and Perry (2001),

According to Neo-Gricean accounts, the capacity to understand the mental states of others and the attempts by agents to behave in ways that manipulate mental states in others is a necessary component of linguistic understanding. In contemporary cognitive science, the capacity to understand, predict, and explain the intentional behavior of others is explained by positing a Theory of Mind<sup>4</sup> and the orthodox operational definition for this capacity is the standard False Belief Task (Wimmer and Perner, 1983). The fact that children are unable to pass this task until around 4 years of age (Wellman *et al.*, 2001)<sup>5</sup> appears to be damaging to Neo-Gricean accounts since children begin to acquire language at 10–14 months of age. Hence, if Neo-Gricean accounts state that a Theory of Mind is required in order for the child to understand and produce language in basic or typical communicative situations, and the child acquires these linguistic abilities before the onset of mindreading, then Neo-Gricean accounts will not fit the empirical data for language acquisition.

It would be truly shocking for Neo-Gricean accounts if younger children were fully functioning members of a linguistic community, yet had profound deficits in understanding the minds of their conspecifics; but this is not what occurs. A brief outline of the development of various linguistic abilities will sharpen our focus concerning the phenomena in question.<sup>6</sup>

Normal children begin to use their first words (other than names for family members or caregivers) at an age ranging from 10–14 months.<sup>7</sup> They continue to communicate using single words, taken from a fairly meager lexicon, for about half of a year until around the age of 18 months, when a word-spurt appears, accompanied with the formation of phrases consisting of two words. The next year is filled with these two-word phrases which have some syntactic structure,

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Hutto (2008), Laurence (1996, 1998), and Zawidzki (2013); and they resonate with some guiding assumptions of many different theorists, including (but not limited to) Borg (2004), Cappelen and Lepore (2005), Carpendale and Lewis (2004, 2006), Gauker (1994, 2003), and Millikan (1984, 2004, 2005).

<sup>4</sup> By saying that a ‘Theory of Mind’ is posited, I am not favoring a position in the traditional debate between those who think that our mindreading abilities are underwritten by an actual theory (Gopnik and Wellman, 1992, 1994; Perner, 1991) and those who think that the abilities are underwritten by the ability to simulate the other agent (Gordon, 1986; Goldman, 1989). I don’t think that any part of my project depends on the outcome of this debate, and I think there is now some consensus that some sort of hybrid story is preferable to either of the older extreme positions (Goldman, 2006; Nichols and Stich, 2003). However, aside from a few places in §6, I am not going to be able to address challenges to the most foundational aspects of this research, i.e. those who reject the ‘ToMism’ paradigm (e.g. Leudar and Costall, 2009; Hutto and Ratcliffe, 2007; Carpendale and Lewis, 2004), many of whom advocate an embodied, embedded, enactive, extended, etc., account of social cognition.

<sup>5</sup> But, this meta-analysis has also been challenged (Yazdi *et al.*, 2006).

<sup>6</sup> It should be noted that there is substantial variation in these ages—what follows are averages.

<sup>7</sup> A more sympathetic timeline (for Neo-Griceans) of the onset of the relevant linguistic development is 14–18 months of age (Tomasello, 2008, p. 161). The onset varies from child to child, but the requisite mindreading abilities seem to be in place at the earliest stages as well (see below).

i.e. word order is respected, yet lack many important linguistic features, e.g. 'Big dog' and 'More milk'. This period of linguistic output is often called *telegraphic* speech since it lacks many features included in adult use of language. These features include, *inter alia*, function words (e.g. 'and', 'of') and closed-class morphemes (e.g. prefixes and suffixes), just as many telegrams lack. At some point just before the age of 2½, the length and complexity of sentences begins to grow (it is still only slightly more complex in that it is slightly longer and more frequently includes actual subjects and noun-verb agreement), and continues to do so steadily through adolescence.<sup>8</sup>

Though nothing theoretical may be known or verbalized about minds for these children, Neo-Gricean accounts require a substantial understanding of intentions, and more specifically, communicative intentions. I will show that this ability to infer and form these communicative intentions is present at an early age, and is clearly present during the critical stages of linguistic development. There may turn out to be differences between the intentions deployed by young children and intentions deployed by adults, but this is a matter for empirical investigation, and should not be used as evidence that semantic competence, or communicative competence for that matter, is intention-*in*dependent, or that Neo-Gricean accounts are in serious trouble.

Here is a conceptual analysis of meaning in terms of communicative intentions inspired by Grice (1957):

(⊖) *S* meant something by uttering *x* iff *S* uttered *x* intending:

- (1) that *S*'s utterance of *x* produce a certain response, *r*, in a certain audience, *A*,
- (2) that *A* recognize *S*'s intention (1), and
- (3) that *A*'s recognition of *S*'s intention (1) shall function as at least part of *A*'s reason for *r*.

In order for the Neo-Gricean story to be true, then, children from the age of 10–14 months must communicate using these sorts of intentions. This all seems like a tall order for such young children since it seems to require that the children understand the full doxastic nature of the propositional attitudes involved and how they interrelate to lead to behavior. It seems difficult to see how a young child can understand such complex intentions and other attitudes even if none of this need occur consciously or be verbalized. The results from the standard False Belief task seem to suggest that children do not grasp this *representational* nature of the mind until long after they become competent communicators. In what follows, however, I will show that the relevant children actually do grasp the representational nature of beliefs and the mind, thus blunting the force of this objection to Neo-Gricean accounts.

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<sup>8</sup> Some story about comprehension is needed as well. Detecting comprehension at these early stages is extremely difficult, but the standard opinion among linguists is that comprehension precedes production to some extent. Hence, evidence of production is evidence that comprehension is also present and has been present earlier in development.

### 3. Gricean Extremes

In order to defend the psychological plausibility of the Neo-Gricean accounts, one must make their metarepresentational burdens explicit. Sperber (2000) has pointed out that Gricean accounts seem committed to the fact that communicators must entertain at least fourth-order metarepresentations of the following form<sup>9</sup>:

- First order: S intends
- Second order: That *H* believes (or sees, etc.)
- Third order: That *S* intends
- Fourth order: That *H* believes (or sees, etc.)
- Representation: That *p*

This amount of metarepresentation places a significant strain on any representational resources that would have to entertain it. Sperber believes that this fact should not be damaging to Gricean accounts because humans have evolved a dedicated communication module that is capable of dealing with these sorts of cumbersome metarepresentations (Sperber and Wilson, 2002), but as aforementioned, many other theorists disagree and take this to be an unpalatable result for the Gricean accounts, especially when applied to younger children; it seems like such young children would be incapable of entertaining such complicated metarepresentations. Moore (2012) calls this objection the ‘cognitive overload claim’ and it exemplifies the worries at the heart of the current article. Amongst the Neo-Griceans, there are three ways of dealing with the cognitive overload claim that vary according to how complicated the intentions included in the analysis turn out to be: a minimalist path, a maximalist path, and a modest path.

#### 3.1 Minimalist Griceans

Bach and Moore are two theorists with Gricean leanings who have suggested some minimalist ways to avoid these complex nested mental states. Moore’s way of undercutting this overload claim for younger children (and perhaps, eventually for communication among the great apes) is to build upon the insight of Neo-Griceans who have noted that the analysis can be broken down into conceptually (if not temporally) separable elements that might be separable in communicative practice (Gomez, 1994, 2007; Gergely and Csibra, 2005; Csibra, 2010; Tomasello, 2008).<sup>10</sup> According to Moore, certain instances of communication are composite

<sup>9</sup> This notation follows Moore (2012), who expands upon Sperber’s notation.

<sup>10</sup> It should be noted that Csibra and Gergely and Csibra, unlike Moore, do not take these elements to be conceptually separable, e.g., ‘from the perspective of cognitive mechanisms, the attribution of communicative and informative intentions can be temporally and procedurally (but not conceptually) separated . . . . One can attribute a communicative intention to the communicator by recognizing the ostensive nature of his action, and then, in a successive

acts that involve parts that correspond to distinct clauses in the Gricean analysis. Moore suggests that ‘we can think of communicative acts not as single actions, but as combinations of two actions—*content* cues and *ostensive* cues—which enact, respectively, the first and second clauses of a Gricean communicative intention’ (2012, p. 14). Ostensive cues are produced in order to attract the attention of the hearer to the speaker, and in the context of a communicative interaction, to actions that the speaker is undertaking, including the production of a content cue. Moreover, these acts turn out to be Gricean in that when the speaker draws the attention of the hearer, then the hearer will typically be in a position to realize that the speaker intends for her to recognize that she is doing so. This insight allows the Gricean analysis to apply to acts of communication, not in virtue of the presence of a single fourth-order metarepresentation, but rather two distinct lower-order metarepresentations that together satisfy the Gricean analysis.

Consider the following example involving an ostensive cue (engaging in eye contact) and a content cue (pointing to a state of affairs, *p*), with, respectively, the following two intentional structures:

Ostensive Cue  
 First order: S intends  
 Second order: That *H* attend  
 Representation: To the fact that she is pointing [that is, to her production of a content cue *x*]

And additionally, by virtue of *H*’s attending to *S*’s content cue, *H* should infer that:

Content Cue  
 First order: S intends  
 Second order: That *H* attend  
 Representation: To the fact that [*p*] (Moore, 2012, p. 21)

This claim is couched in third-person terms, but Moore notes that this is misleading. Continuing with Moore’s example, one could analyze the situation from the speaker’s perspective as follows:

First order: You attend  
 Representation: To the fact that I am pointing [that is, to my content cue *x*]

And subsequently:

First order: You attend  
 Representation: To the fact that [*p*] (Moore, 2012, p. 22)

From the interpreter’s perspective, the situation would require the following to count as Gricean:

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process, can attempt to infer the content of the implied informative intention’ (Csibra, 2010, p. 143).

First order:        You intend  
 Second order:     That I attend  
 Representation:    To the fact that I am pointing [to my content cue  $x$ ]

I understand your message if, upon attending to your point, (or any equivalent utterance of  $x$ ), I can infer that:

First order:        You intend  
 Second order:     That I attend  
 Representation:    To the fact that [ $p$ ] (Moore, 2012, p. 23)

With this apparatus in place, Moore is able to summarize his solution to the cognitive overload claim: ‘In order for them to grasp Gricean intentions, we need only assume that infants can grasp second-order metarepresentations. And in order for them to act with Gricean intentions, we need only assume that they can entertain first-order meta-representations. These requirements are surely less contentious. They surely undercut the cognitive overload claim’ (Moore, 2012, p. 23)

This is an ingenuous solution, and I think that neo-Griceans would be well-advised to consider it seriously. However, Moore’s solution comes with certain costs.

First, here is how Moore outlines the three clauses of the Gricean analysis:

- ( $\Omega$ ) 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 recognize 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).

As Moore notes, this is a significant departure from the traditional Gricean analysis given in ( $\Theta$ ), similar to one suggested by Neale (1992). The difference lies in the restrictive third clause, which, rather than an additional intention or two, is added to deal with the counterexamples to the sufficiency of the analysis since the number of additional clauses needed to avoid counterexamples seems unbounded by anything other than the imagination of the theorists generating them. Hence, we need a clause ruling out any sort of deceptive intention, rather than simply adding another iteration or two of transparently recognized intentions.

Avoiding cognitive overload is important for solidifying the prospects for Neo-Gricean accounts, but avoiding it in the way that Moore and Neale do is a serious departure from Grice (although both of them acknowledge this) in that it blurs the distinction between showing someone that  $p$  is the case and communicating to someone that  $p$  (or meaning that  $p$  by uttering  $U$ ). This is because the third clause of the traditional analysis is the one that stresses the importance of the recognition

of the previous clauses, where that recognition should play the role of a reason for this recognition. On Moore's account, it is not necessary that *S* intend that the first two clauses be recognized as intended to be recognized by *H*. This is helpful for avoiding iterations and regresses, thereby reducing the cognitive load involved, but not for salvaging the more traditional Gricean mechanism that stresses the reason-based, as opposed to causal nature of the communicative process. This is a steep price to pay, if there is another solution that retains more of the traditional Gricean motivation for this sort of account of communication.

Second, Moore loosens the requirements for the types of appropriate response, *r*, in the first clause of his analysis. He does this to combat the claim discussed elsewhere in this article that since children fail the standard False Belief Task, they cannot possibly understand reasons (since reasons contain beliefs as components) and cannot understand what beliefs are or understand that someone is trying to token beliefs in themselves or in another. Though Moore suggests that the sort of data I outline below may show that something like belief is present in the children under discussion, he is more interested in showing that whether or not the children understand belief, understanding belief proper isn't necessary for communication, since an understanding of other mental states (e.g. attending, seeing, recognizing) will (almost always) suffice for our explanatory needs.

Although this extension of the types of responses in the analysis is reasonable, it has at least two downsides. First, it unnecessarily minimizes the depth of the understanding of beliefs that these infants seem to possess (as will be shown below). Second, it, like the replacement of the third clause, paints this analysis of communication in much more of a causal (rather than a reason-based) manner than most Griceans are comfortable with. The need for this extension arises much more prominently for certain Neo-Griceans who wish to extend the analysis to cover some non-human primates, but even if there are reasons to make this extension, it need not apply in general to every case of infant communication (although some infant communication might take place within that more limited framework). I will argue that there are still many examples of infant communication that meet the higher, more traditional, Gricean standards.

Bach offers a different sort of reaction to the cognitive load claim, as offered by François Recanati (1986). Recanati argues that Grice's insight into the nature of communicative intentions seems to lead to two dead ends, unless this insight is substantially altered. Either the intentions as they are articulated are hopelessly and complexly iterated, which leads to their psychological implausibility, or they are articulated as *reflexive*. The problem, according to Recanati, is that reflexive intentions must contain infinitely iterated sub-intentions, so this too leads to an analysis of communicative intentions that is psychologically implausible. Bach offers an alternative minimally Gricean account of in what this reflexivity of communicative intentions might consist (1987; Bach and Hamish, 1979).

Bach notes that Grice's original analysis of speaker meaning (Grice, 1957) does not take the form offered in (Θ) that lists the intentions iteratively. Grice originally described communicative intentions as *self-referential*, but as Blackburn points out

(quoted in Bach), ‘philosophers have avoided this simple concept in favour of the linear complexities because they are morbidly afraid of paradoxes of self-reference’ (Blackburn, 1984, p. 116). Bach argues that both Recanati and the philosophers spooked by these paradoxes miss the mark, since there is nothing mysterious about Gricean communicative intentions. They neither lead to paradoxes, nor do they lead to infinitely many sub-intentions—they are merely reflexive. Hence, one can maintain Grice’s insight while avoiding regresses and paradoxes.

Suggesting a return to Grice’s original and fundamental insight, Bach argues ‘that the audience identifies the speaker’s intention partly on the basis that he is to identify it . . . the basic issue is not how a communicative intention refers to itself, but how it can specify the means for its own fulfillment: the audience is to recognize it partly on the basis that he is to take himself [a]s [*sic*] intended to do so’ (Bach, 1987, p. 148). The critical element here is that it was a mistake for Grice and his followers to separate the analysis into separate clauses with separate intentions because this suggests that these elements are to be recognized separately. We need to focus less on the puzzles about *reflexivity* and more about what it means to be *fulfilled when recognized*. In a communicative context,

*A* has good reason to think that *S* intends him to recognize this intention, i.e., to identify what *S* is doing in making the utterance. Moreover, the intention for him to recognize this intention is not a distinct intention; rather, it is the very intention that he is to recognize . . . He does not identify [the communicative intention] by way of recognizing it; he identifies it partly on the supposition that whatever its specific content, part of its content is that he is to identify it (Bach, 1987, p. 150).

Based on Bach and Harnish’s (1979) theory of speech acts, what this amounts to is the following, ‘For *S* to express an attitude is for *S* reflexively to intend *A* to take *S*’s utterance as a reason to think that *S* has that attitude’ (Bach, 1987, p. 152). The speaker intends for the audience to recognize that *A* has a reason to infer that the speaker has a particular attitude. As Bach explains, ‘For *S*’s intended audience understands him in his utterance if it identifies the attitude he is expressing, and that is to recognize his communicative intention’ (1987, p. 153). It is through the recognition that I am trying to make an effect upon you that I hope or expect to make that effect on you, e.g., it is through the recognition of the fact that I am trying to get you to understand that I believe that *p* that I hope or expect that you (eventually) understand that I believe that *p*.

If Bach’s account works, this too, would be good news for the Neo-Gricean accounts, since what must be mastered is not something that would require substantial metarepresentational resources, but rather a distinctive type of intention. There seems to be no good reason that failure to pass standard False Belief Task would be evidence that younger children failed to grasp these reflexive intentions, and there seems to be good reasons to think they master these communicative intentions. But, there are a few potential problems for Bach’s solution. First, though

this can hardly be a criticism without substantial development, Bach's account is tied to a particular theory of speech acts and to the extent that the details of that theory can come apart from Neo-Gricean accounts generally, it can be attacked separately (Siebel, 2003; Davis, 2003). Second, though Bach says that his analysis avoids any serious problems with paradoxes of self-reference, others may not be so convinced that his account deflates all of the worries hinted at by Bach and Blackburn (Mele, 1987; Siebel, 2003). Third, these reflexive intentions seem to constitute a *sui generis* class of intentions unlike any others. Intentional communication is certainly unique, but part of the appeal of Grice's account is that in most articulations, it fits nicely into a conceptual space of reasons and rational intentional activity more generally without positing a new unanalyzable entity that does most of the explanatory heavy lifting.

None of these criticisms of Moore and Bach are intended to be fatal. These minimalist Neo-Gricean accounts are Gricean enough in most respects to vindicate the general framework and overcome the cognitive overload claim for younger children. But, each of these proposals comes with a range of areas for improvement or elaboration, many of which center around the extent to which they jettison some traditional Gricean components. In what follows, I hope to show that more traditionally Gricean accounts can overcome the overload claim and the related challenges to the necessity of the analysis. But before turning to those theories, I want to consider some other Gricean ways of handling the problem of younger children and cognitive overload.

### 3.2 Maximal Griceans

Other Neo-Griceans seemed to have conceded the point about these intentions needing to be complicated and iterated, but have sought some other way for them to still be handled in real-time, real-world communicative situations. I concede that, like the minimal solutions above, these maximal solutions offer promise in vindicating the basic Gricean framework, but I they are not ideal choices, either, since there are drawbacks to them as well.

One Gricean way of conceding the deeply iterated nature of these intentions, while still explaining that communication surely *seems* to succeed, is suggested in an earlier paper of mine (Thompson, 2008). There, I explained that Grice uncovered the fact that meaning should be understood as an absolute concept—an unattainable ideal that can be approximated, but never strictly speaking, attained, in so far as communicative intentions achieve more and more transparency between interlocutors (so as to avoid situations like those that challenged the sufficiency of Grice's analysis). Hence, communicative situations can be judged to be better or worse cases of meaning to the extent to which they approach the ideal, transparent cases, but they are, in the strictest sense, not cases of meaning. This sort of contextualist story allows us to judge cases of real-world communication in terms of their level of success (and pinpoint their deficiencies), as well as explain why the challenges to the sufficiency of the analysis are problematic, while still holding on

to the traditional Gricean analysis. Hence, according to this account, the infants will satisfy enough of the Gricean analysis to count as communicating or meaning in the Gricean sense, but will be at some distance from the ideal (just like every other communicator), depending on the features of the context. Like the minimalist accounts, this account maintains the central features of the Gricean analysis and allows for a fully functional account of meaning attribution, but this concession about psychological implausibility (in the strictest sense) is a tough pill to swallow, if there are other Gricean accounts that can avoid it.

Sperber and Wilson (2002) take a different maximal route, arguing that there is a proprietary Theory of Mind capacity that is specifically dedicated to the production and comprehension of higher-order communicative intentions. If typical communication takes place with fourth-order communicative intentions, the early emergence of this ability and its metarepresentational requirements can perhaps achieve psychological plausibility with the positing of a communication module that is dedicated to solving just these sorts of tasks. Hence, Neo-Gricean accounts need not be in trouble.

This route has some limitations as well. First, it seems as though utterance interpretation and communication in general, as it relates to Theory of Mind processing, is not well-suited to be an informationally encapsulated process, since it seems to be a paradigmatic global, isotropic process (Fodor, 2000, 1983). This fact might be somewhat of a problem for most Neo-Gricean accounts, but it looms especially large for explanations of this ability that make psychological plausibility depend on modularity so explicitly. Without something like informational encapsulation, it is hard to see how this 'module' avoids being bogged down by the metarepresentations required in Neo-Gricean accounts. Hence, if it is informationally encapsulated, it cannot solve the tasks it needs to solve; but, if it is not informationally encapsulated, it cannot avoid the cognitive overload claims about these metarepresentations.

Second, some of the empirical results that motivated and supported the postulation of this communication module have been dampened by the implicit false belief tasks discussed below (some of this work has been done by Sperber himself (Surian *et al.*, 2007)). The original claims were supported by evidence that false beliefs were mastered in communicative situations before they were mastered more generally, but not in the reverse order (Happé and Loth, 2002). Since it now seems that false beliefs are understood in non-communicative situations at earlier times than in communicative situations (or at least that they emerge at roughly the same time), this evidence is not as compelling as it first appeared to be (see below). The postulation of a module to solve worries about psychological plausibility seems to rise or fall with the explanatory power of modular accounts, in general. It may seem question-begging, or appear to be an explanatory cheat to get Neo-Gricean accounts out of a jam without better evidence that independently motivates it.<sup>11</sup>

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<sup>11</sup> The existence of people on the autism spectrum who nevertheless communicate offer an interesting insight into the relationship between Theory of Mind and communication,

### 3.3 Avoiding Extremes: A Modest Neo-Gricean Account

My goal has not been to make the more extreme Neo-Gricean positions seem wildly implausible. Indeed, I think that they are viable versions of Neo-Gricean accounts, but as I have pointed out along the way, they each have limitations. If we end up salvaging these theories by landing upon a minimalist or maximalist Neo-Gricean Account, we will have an explanation of language development with substantial fecundity, but only at the price of possibly losing some explanatory insight or becoming substantially less Gricean. Hence, taking any of these more extreme positions are acceptable outcomes for accounts that vindicate Grice's insight. But, there is still an articulation of these communicative intentions that falls somewhere in between the two extremes and still captures most of the intentional communication that occurs at the ages under discussion. It also more closely resembles the traditional Gricean analysis than either of the extremes.

In order for the Neo-Gricean story to be true, children from the age of 10–14 months must communicate using the sort of intentions in ( $\Theta$ ). According to a *modest* account, this requires at a minimum that they form second-order communicative intentions of the form *I intend to produce a response r, in the audience, A, at least partly based on the A's recognition of this intention*. Or, more conspicuously, *I intend for A to recognize (I intend to produce r in A)*. As an interpreter, the child must understand, *S intends for me to recognize (S intends to produce a response in me)*. In addition to this, the child must grasp that this is no mere *causal* process of communication. The recognition of these intentions is itself something that must be intended to serve as a *reason* for the response in the audience.

This modest Gricean account is more similar to the minimal accounts than the maximal accounts, but it differs in important respects. First, unlike Bach's account, the necessary understanding is not enshrined in a unique type of *reflexive* intention. Second, unlike Moore's suggestion, the responses that satisfy *r*, can include, but are not limited to *attending to p*, *seeing that p*, or *recognizing that p*, i.e. for this modest account, *believing that p* is a response that is available to the communicative participants as well, allowing for a deeper understanding of folk psychological states for even these younger children. Third, the reason-guided nature of this process is made central, either through the introduction of an additional intention (or set of intentions) or some additional understanding that require that the recognition of the other intentions is not just a causal result of the communicative act, but a *recognition* result. Hence, this uptake is not protected by the mere absence of sneaky intentions (as in Moore and Neale's accounts), but by the addition of the requirement that the recognition of these intentions is itself something that must be intended to serve as a *reason* for the response in the audience. This can be achieved either by a general, standing (though non-explicit and non-verbalizable) understanding of how successful communicative situations work via beliefs and

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especially for Relevance Theory. These individuals may end up providing evidence for a communication module (de Villiers *et al.*, 2007).

desires conspiring to form intentions which lead to behavior, or by an additional intention or set of intentions that is occasioned or tokened on each (successful) communicative encounter that captures this requirement. In what follows, I suggest that there is sufficient evidence suggesting that intention-structures of this sort are grasped and produced by the children in question.

#### **4. The Evidence**

In showing that the psychological capacities that Neo-Gricean accounts require are present, I will take both an indirect route and a direct route. Taking the indirect route consists in showing just how robust Theory of Mind abilities are in development, and based on these facts, suggests that there is *most likely* some sufficient understanding of communicative intentions in addition to a representational grasp of belief. The more direct route consists in discovering evidence that an understanding of communicative intention-structures is present. Some of the experimental data I present are hardly cutting-edge—these phenomena, in some cases, have been acknowledged for decades. What is novel in the approach I offer here is using both the direct and indirect routes together to both establish the complexity of the intentions involved in this early communication as well as place all of this behavior in a context where even these young communicators can appreciate the reason-involving nature of this activity.

##### **4.1 The Indirect Route**

In order for these attacks to constitute a devastating criticism, one needs to demonstrate that the standard False Belief Task is the appropriate measure of Theory of Mind, i.e. that younger children fail it because they lack the Theory of Mind abilities it is supposed to measure, and not because of some other inadequacy in them. There are two basic types of explanations of why children fail the standard False Belief Task before the age of four. According to one type—a *conceptual* explanation—a major revolution in understanding or conceptualizing the representational nature of belief occurs around the age of four that allows the child to pass the task (Gopnik, 1993; Gopnik and Wellman, 1992, 1994; Wellman, 1990; Perner, 1988, 1991; Perner *et al.*, 1994; Perner *et al.*, 2005). According to the other type—a *processing* explanation—something about the processing demands involved in the task keeps the child from passing the task before the age of four (Roth and Leslie, 1998; Mitchell, 1996; Kikuno *et al.*, 2007; Fodor, 1992; Leslie *et al.*, 2005). According to the processing explanation, the representational nature of the mind and the beliefs it contains are understood long before the child is able to answer the question posed by the experimenter properly.

Probably the best processing story about what is problematic for the younger children suggests that the task is simply too taxing for the young children's underdeveloped executive functioning (EF) abilities (e.g. see Leslie *et al.*, 2005). At

least three pieces of evidence are relevant for defending this claim. First, Bloom and German (2000) develop this sort of general criticism by insisting that the standard False Belief Task is a very complicated task above and beyond the difficulty dealing with false beliefs—one that also poses a pragmatically confusing question for younger children. Second, Birch and Bloom have discovered that when put into a scenario where EF is taxed, adults also fail to use an agent's false belief in predicting their behavior (Birch and Bloom, 2007). Third, given that elderly adults typically suffer from diminished EF abilities as they age, it is critical to note that when tested, these elderly adults end up being even worse than middle-aged adults at similar versions of false belief tasks that tax EF abilities (German and Hehman, 2006). These results have led many to suggest that there is a bias towards reality (in this sort of case, the real location of the candy) that both adults and children must overcome to succeed at these tasks, or perhaps that people use a default attribution of true beliefs unless there is a need for and the attention required to set aside those reality-congruent mental states for reality-incongruent ones, as is required in false belief scenarios. At bottom, according to these theorists, it is a lack of EF development that explains why children fail the standard False Belief Task, not some deficit in Theory of Mind. Hence, just because the young communicators discussed in this article fail the standard False Belief Task, this is no guarantee that they lack the Theory of Mind abilities needed to grasp the relevant communicative intentions.

These processing accounts have acquired substantial evidence in their favor with the new wave of *implicit* false belief tasks that has emerged over the last half-decade. Clements and Perner (1994) were the first to discover this sort of implicit grasp of false belief in children who were otherwise unable to make this understanding explicit. They discovered that children aged 36 months who gave the wrong answer on the standard False Belief Task would nevertheless look to the right location before giving the wrong answer. This initially seemed promising for proponents of Neo-Gricean accounts, but Clements and Perner were unable to demonstrate this looking behavior in 30-month-olds or children of younger ages.

Results more promising for the processing accounts and Neo-Gricean accounts arrived when Onishi and Baillargeon (2005) devised a nonverbal version of the false belief task that 15-month-olds could pass. In these experiments, infants watched a typical false belief scenario in which an adult places an object in a container, and then (the adult) is either able or unable to see that object change locations. Onishi and Baillargeon hypothesized that if the infants understood the representational nature of belief, then their expectations should reflect this, as reflected in their looking times (i.e. Onishi and Baillargeon interpret longer looking times as evidence of surprise—that infant expectations were violated). If they understood that an agent's take or perspective involves a representation or take on reality—one that can be true or false, based on what the agent has seen or not seen—they should be surprised and should look longer in two scenarios: when the adult searches for the object in the old location (if the adult saw it moved), and when the adult looks for the object in the new location (if the adult did not see it moved). Accordingly, the

children should be uninterested if the adult looks for the object in the old location (if the adult did not see it switch), and uninterested if the adult looks for it in the current location (if the adult did see the switch).

In fact, the infants were surprised when the adult failed to act on her veridical information about the object's location, and were surprised when the adult failed to act on her false information about the old location, exactly as Onishi and Baillargeon predicted. According to the conceptualist explanation of why children fail the standard False Belief Task, this behavior makes no sense. If they lacked an understanding of the representational nature of belief, the children should not have been surprised when an adult who did not see the switch reaches to the object's current location. If the child did not realize that her beliefs could be different from another's beliefs, she should have assumed that since she saw the object being moved, the adult would know its current location as well. But, this is not what happened. The children grasped how accurate perspectives should lead to behavior, and how inaccurate perspectives should lead to behavior, despite their inability to pass the standard False Belief Task, leading Onishi and Baillargeon to conclude: 'These results suggest that 15-month-old infants already possess (at least in a rudimentary and implicit form) a representational theory of mind: They realize that others act on the basis of their beliefs and that these beliefs are representations that may or may not mirror reality' (2005, p. 257).

These startling results generated some skepticism and genuine puzzlement (Perner and Ruffman, 2005; Ruffman and Perner, 2005) but the results have since been extended in interesting and relevant ways. The results are no longer limited to the Violation-of-Expectation paradigm, but also include measures of anticipatory looking (similar to Clements and Perner's method) (Southgate *et al.*, 2007) as well as measures in which children are able to use their understanding of false belief to actively help an experimenter complete a task (Buttleman *et al.*, 2009). The range of mental states that have appeared to be understood in this implicit way is also expanding to include false perceptions of a scenario (Song and Baillargeon, 2008) as well as false beliefs about the identity of an object (rather than just the object's location) (Scott and Baillargeon, 2009). The age at which this implicit grasp of the representational nature of belief is present has since been lowered to 10 months (Luo, 2011). These results suggest that even young infants understand, if only implicitly, an extremely deep and critical aspect of how minds work much earlier than previously thought.<sup>12</sup>

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<sup>12</sup> Not surprisingly, there is currently a debate raging over how to interpret these results. Skeptics like Perner and Ruffman have demanded evidence that an implicit grasp of false belief be available in a wide and flexible number of belief-inducing scenarios that required different sorts of responses before they would find the evidence warranted the positing of a representational understanding of beliefs and mind (rather than positing, e.g., a handful of behavioral rules). The results presented above were gathered to demonstrate just such an understanding, but the debate continues (Perner, 2010; Low and Perner, 2012).

In addition to this grasp of false belief, there are two additional sorts of evidence that are available to researchers who are trying to identify the onset of general Theory of Mind capacities in children. First, children provide evidence of their ability to mindread in their activities insofar as they behave in ways that require some understanding or appreciation of the mental lives of those around them. Second, once children begin to use words, researchers have a novel source of information in the speech of children. Before children can pass the standard False Belief Task, they begin to use terms that refer to mental states. It is thus possible to examine the timing of the use of these terms, as well as the types of uses and the contexts in which these uses occur. Hence, these two sources of information will enable us to judge the extent to which children understand the minds of others in ways other than by using false belief tasks.

One of the factors that false belief tasks measure is the child's understanding of how experience leads to knowledge in other people. At some point, the child must realize that his or her knowledge depends on having specific experiences and that someone who has not had those experiences will not have the same knowledge of a situation because of this lack of experience. Evidence collected by O'Neill (1996) however, suggests that this understanding of how experience leads to knowledge is understood by children long before the age of four. As she puts it, these children 'tailor their communication to the knowledge states of communicative partners' (1996, p. 659). O'Neill tested two-year-olds on two types of tasks in which the child is required to use his or her parent to obtain a toy that has been placed in an opaque container on a high shelf. In one set of tasks, the child's parent is present and observes the placement of the toy. In the other set of tasks, the parent either shuts his or her eyes, or leaves the room, during the placement of the toy. When asking the parent to get the toy, the children gave more information to the parents in the latter type of tasks—those in which the parents were ignorant of the location of the toy. The children gestured more frequently and were significantly more likely to name the container or the object in the container than when the parent was present during the concealment. This suggests that children understand enough about the minds of others to realize that the parent would not know the location of the desired toy because he or she was not present in the room (or more interestingly, had his or her eyes shut) when the toy was hidden, and in this type of case, the child must offer more information to their parents. Children understand that their knowledge of a state of affairs can differ from the knowledge of others, based on the lack of a particular bit of experience. Moreover, the children realize that if they want to obtain the toy, they must give more information than normal in order to get the parent to recognize the location of which they are ignorant.<sup>13</sup>

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<sup>13</sup> This early evidence gathered by O'Neill is vastly augmented and extended by Liszkowski's work on infant pointing, which supports a rich understanding of intentions and other aspects of minds in pre-verbal infants, which due to space limitations, I can only mention (Liszkowski, 2005; Liszkowski *et al.*, 2006; Liszkowski *et al.*, 2007a, b, 2008; Liszkowski *et al.*, 2009; Tomasello *et al.*, 2007).

Around the age of 18 months, children also initiate pretend play and understand pretense in others. This is an important aspect of Theory of Mind since children who can understand and initiate pretend play know enough about the mind of their playmate to realize that the child is playing with a banana, for example, but is acting as though it is a telephone. Leslie (1987) has claimed that this understanding of pretense involves some sort of metarepresentational insight that allows the to understand that they are acting according to counterfactual beliefs.<sup>14</sup>

Another good source for Theory of Mind abilities is children's understanding of agency and intended actions. Children can imitate and complete intended actions of others before their second birthday. Meltzoff (1995) has shown that if a subject (aged 18 months) witnesses an adult unsuccessfully attempt an action, the child will not repeat the movement that they witnessed—they see the agent as someone who unsuccessfully tried to complete an action and will attempt to reach the intended goal. For instance, if children witness an adult try unsuccessfully to hang a ring on a peg, the child will often perform the intended action even though they never witnessed it, i.e. they will not perform (attempt to imitate) the failed attempt or think that succeeding at the action is accomplished by failing to hang the ring.

I noted above that there is another source of information about what children know about the mind. Once the child begins the word spurt at around 18 months, we have an entirely new source of evidence about what children know about the mind—the content of their speech. Bretherton and her colleagues (Bretherton, 1991; Bretherton and Beeghly-Smith, 1982; Bretherton *et al.*, 1981) collected information about children's speech from mothers who were asked to report the child's utterances if they fell into a particular mental category. Bretherton *et al.* note that a third of their subjects began to use language about mental states late in their second year, and that a rapid spurt exists in the third year. The corpus of utterances that Bretherton has amassed for children 36 months and younger includes an astonishing array of terms about the mental realm in the following categories: perception (sight, pain), internal monitoring (hunger, thirst), affect, volition, knowledge, memory, among others. In further analysis of the speech of children in their third year (from 28 months on), they found the following:

... the ability to analyze the goals and motives of others, as these interlock with the child's own, is already fairly well developed in the 3<sup>rd</sup> year. We have evidence that 28-month old children interpret their own and other people's mental states, comment on their own or someone else's expected and past

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<sup>14</sup> The scientific exploration of pretense has flourished since Leslie's pioneering work. Perner and colleagues (Perner *et al.*, 1994) have challenged the metarepresentational account of Leslie and offered an alternative non-metarepresentational account, but their argument against Leslie and in favor of this account lose much support when taken in light of the implicit false belief tasks described above. For more recent defenses of the metarepresentational account see (Friedman and Leslie, 2007; Friedman *et al.*, 2010).

experiences, and discuss how their own or someone else's state might be changed or what gave rise to it (Bretherton and Beehly-Smith, 1982, p. 919).

According to these data, children do not simply drop these mentalistic words into a conversation, but rather incorporate them into contexts that show they understand that these words apply to scenarios involving the changing mental states of themselves and others.<sup>15</sup>

To argue indirectly, then, Neo-Gricean accounts can explain that this evidence points to the fact that children have significant Theory of Mind abilities from the ages of 10 months to four years. While these abilities do not bear directly on the presence of communicative intentions, many of the capacities involve an understanding of what people are intending to do by performing an action, an understanding that people's knowledge depends on what they perceive, and that people's knowledge of the world can be different from the child's own knowledge. These abilities seem to provide a substantial backdrop for the presence of an ability to see that someone has thoughts different from your own, to realize that observable signals can affect those thoughts, and that actions have intended effects—you can bring about intended changes in the thoughts of others by having those other people recognize that you are behaving in a certain way. The full significance of these additional abilities will, I argue below, serve to buttress the claim that this is not a merely causal process, but rather a reason-giving one involving representational mental states.

#### 4.2 The Direct Route

Grice (in)famously analyzed communication by unpacking the intentional behavior of the speaker (rather than the interpreter), so that is where the direct route begins—the intentional communicative behavior of these young children. Bates and colleagues break down infant communicative behavior in the first year of life into three stages.<sup>16</sup> The first stage involves *intentional attempts to change their environment* that take little, if anything, about the mentality of the child or the audience into account—the children simply produce a signal to accomplish some end. The second stage involves what Bates *et al.* describe as *intentional behavior designed to influence other persons*. These communicative attempts lack a deep understanding of how agents work, but do suggest some minimal understanding of the audience. They show little flexibility in terms of how the production of some signal can affect the audience and basically grasp that generating or repeating the same signal will produce the same effect in their audience. For example, at this stage, 3-month-olds will repeat their recent behavior in order to get an adult to reproduce similar

<sup>15</sup> For more on the use of mentalistic vocabulary in children see Bartsch and Wellman (1995).

<sup>16</sup> A similar description of some of these experiments and others, as well as suggestions for Gricean ways to interpret them can be found in sec. II of Thompson, 2007.

behavior, and 7-month-olds will repeat an action that led to laughs, expecting laughs to follow. Children of this age also play games that involve certain roles that are carried out, e.g., the child and an adult take turns knocking over Big Bird, and the child will show disappointment if the game ceases suddenly (Bates *et al.*, 1975). The third stage, however, achieves a sufficiently sophisticated character—that of involving Gricean intentions—because it involves *intentional attempts to change the objects with mentality via certain aspects of their mentality*.

It is around the age of nine months—the so-called *Nine-month revolution* (Tomasello and Rakoczy, 2003) that children become substantially aware of the presence of agents in their surroundings. At this age, children begin to form (and are deeply interested in maintaining) *joint attention triangles*, wherein a child and an adult fix upon a common referent (Tomasello, 2008). While in these joint attention triangles, a child and an adult attend to one another and to some object or event (and to one another's attending itself) in a novel, shared manner that escaped these children up until this stage of development (for more on what makes these joint activities unique, see Eilan *et al.*, 2005). Rudimentary pedagogical assistance in performing a task can also occur within these triangles. For example, if a parent shows the child a hole through which a peg will fit, instead of trying to make a gross approximation of the parent's motor movement (that of making as if to put the peg in the hole), the child will actually try to place the peg in the hole (Trevvarthen and Hubley, 1979).

But, what is most critical for the developmental worries under discussion is that *full-blown intentional communication* begins to emerge during the Nine-month revolution. In an oft-cited passage, Bates and colleagues define this stage of communication as the following:

Intentional communication is signaling behavior in which the sender is aware, *a priori*, of the effect that the signal will have on his listener, and he persists in that behavior until the effect is obtained or failure is clearly indicated. The behavioral evidence that permits us to infer the presence of communicative intentions include: (a) alternations in eye contact between the goal and the intended listeners, (b) augmentations, additions, and substitutions of signals until the goal has been obtained, and (c) changes in the form of the signal toward abbreviated and/or exaggerated patterns that are appropriate only for achieving a communicative goal (Bates *et al.*, 1979, p. 39).

Unlike the communicative attempts that emerged earlier in development, at this stage, children are able to understand that an utterance (understood in the broad Gricean sense to include gestures) can have a certain effect on the audience, *in virtue of certain aspects of his or her mentality*. By this stage, 'The child understands that the audience must recognize the child's intention to communicate, and the child will follow certain constraints in order to achieve this recognition. The child understands what sorts of things can lead to that effect or intention not being realized. He or she realizes that eye gaze is crucial and he or she makes sure that

the audience is attending to the signal' (Thompson, 2007, p. 83). The child is able to exploit this understanding by producing a range of signals in order to achieve her communicative goal, modifying the signals across communicative contexts, as needed. For example, younger children commonly hold up their outstretched arms as a signal that they want to be picked up by a caregiver, but over time, the children truncate this signal to a subtler lifting of the arms. These examples cover nonlinguistic communication, but children begin to acquire words at this time as well, and they quickly come to realize that verbal utterances can also be produced in order to get things with minds to respond in similar ways. For instance, even children at the one-word phase of language development (10–18 months) consider the other agent's epistemic position when deciding how to talk about an event. When there is joint attention towards an object (either established through eye gaze or through previous speech (by children or adults)) children at this stage will simply comment on the object, whereas if an object was not being attended to, the child consistently mentions the name for the object to draw the attention of the interlocutor, waits for uptake in the audience, then comments on the object.<sup>17</sup>

Moving past the traditional Gricean analysis of communication in terms of intentions in the speaker, we also need some account of how these young communicators grasp these Gricean intentions when tokened in others and directed towards them. As aforementioned, gathering evidence of comprehension is more difficult than gathering evidence of production, but aside from the general claim that comprehension precedes production, naming situations offer a unique opportunity for the parties involved to make the child-directed nature of their behavior obvious.<sup>18</sup> Recent evidence within what has been called the 'Active Helping' paradigm has been offered by Southgate, Chevallier, and Csibra (2010). What is interesting about this evidence is that it is a striking example where not just the child's attention or interest is being measured (as in the Violation-of-Expectation paradigm), but the child's intentional, active participation with another agent. These researchers adapted a naming task originally developed by Happé and Loth (2002) that requires an understanding of false belief. In this naming situation, an experimenter places two toys in two covered boxes and leaves the room. Another experimenter comes into the room and switches the location of each toy to the other covered box. The first experimenter then returns and points to one box and says, 'this is a "sefo"'. The infants (aged 17 months) are later presented with the two toys and asked to produce the sefo. Just as in Happé and Loth's original experiment, in which older children reliably passed a version of the task before they could pass the standard False Belief Task (but never the other way around), the infants seemed

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<sup>17</sup> See Greenfield and Smith, 1976; Scollon, 1979; Bloom, 2000; and Tomasello, 2008, as well as the citations above regarding infant pointing behavior, for many more examples of this sort of consideration of the minds of others in directing and amending communicative signals.

<sup>18</sup> In a series of experiments, Baldwin (1991, 1993a, b) also explores the comprehension of intentions in word learning situations.

to grasp that the experimenter was intending to refer to the object that he falsely believed to be in the box towards which he ostended, rather than the object that was actually in that box, and produced the toy in the other box as the thing named 'sefo'.

We get a window into what the child grasps about the referential intentions of the speaker in these situations. In divining these referential intentions, the child must be able to decide which of the objects she is supposed to be informed about. This is not a trivial decision, especially if the child lacks an understanding of how perspectives shift from person to person. It is surely possible that the child might have assumed that the object currently in the box was the sefo (and in fact, this would have been predicted by a past and widely held interpretation of the standard False Belief Task results—that children lacked an appreciation of the fact that what the child (or the other experimenter) knows is not what the original experimenter knows). Instead, the child considers which experimenter is doing the naming and the person to whom he is directing that information, based on what he thinks the child knows. The child would have surely had a different judgment if the second experimenter had done the naming, or if he directed that information at a different agent (the original experimenter, a new participant just added to the scenario, etc.). What the children seem to be grasping is that a *particular agent* is directing *her* (the child's) attention in a communicatively informative way towards one object or state of affairs, rather than another accessible object or state of affairs, and that she is supposed to be recognizing this, rather than something else that might be part of the communicative context.

The evidence reviewed here suggests that children between the ages of nine and eighteen months can produce and comprehend Gricean intentions as required by the Neo-Griceans. As described above, Neo-Gricean accounts require that the child master second-order communicative intentions of the form *I intend to produce a response in the audience at least partly based on the audience's recognition of this intention*. Or, more conspicuously, *I intend for the audience to recognize (I intend to produce a response in the audience)*. As an interpreter, the child must understand, *S intends for me to recognize (S intends to produce a response in me)*. It is critical that the recognition of these intentions is itself something that must be intended to serve as a *reason* for the response in the audience. In order to demonstrate a Gricean communicative intention, these children must not simply be able to manipulate their audience successfully, they must be able to produce multiple signals in order to achieve the right sort of *mentalist recognition* of the intention that they intend to communicate. They are not merely intending to *cause* a response, but rather intending to produce a response through the *recognition* of some such intention.<sup>19</sup>

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<sup>19</sup> One might contend that intentions like these could be mere first-order intentions of the form *I intend for them to recognize my behavior (signal)*, with no additional intention of how the production of the response is to take place. But I do not think this will succeed, as I have argued, 'this is just a version of a Gricean intention that disguises the critical element,

## 5. Intentions and Reasons

At this stage, the reader may be willing to agree that the evidence presented here makes a fairly convincing case that the children at the relevant ages master the second-order Gricean intentions of the form *I intend for the audience to recognize (I intend to produce a response in the audience)* yet deny that they master the additional element (captured in the third sub-clause of the analysis) that the recognition of these intentions is itself something that must be intended to serve as a *reason* for the response in the audience. This is where the indirect case is crucial for filling in exactly how much the children understand about how minds work, even at these young ages. Though one may balk at the idea that children this young might understand how reasons work, the substantial evidence from the implicit false belief tasks suggests that they do understand how the core propositional attitudes (intentions, beliefs, desires) hang together and lead to predictable (and potentially puzzling) behavior.

Hutto (2008) raises this issue as a worry not for implicit versions of false belief tasks, but for the explicit standard False Belief Task, arguing that it seems possible that a child could understand how beliefs work, but not know how they interrelate with desires (that they can form a belief-desire pair that becomes the basis for an intention that will lead to behavior). As he puts it, ascribing a reason to some agent X:

... would require ascribing to X a complex state of mind, minimally consisting of a belief/desire pair with interlocking contents. Reasons are not to be confused with isolated thoughts or desires. To think of an action as performed for a reason, it is not enough to imagine it as being sponsored by a singular kind of propositional attitude; one must also ascribe other kinds of attitudes that act as relevant and necessary partners in motivational crime (Hutto, 2008, p. 26).

Although Hutto fails to consider the recent implicit false belief tasks, it seems that even in these tasks, the infants' looking behavior would not make sense if the child merely had a grasp of an isolated belief or an isolated desire.<sup>20</sup> To understand what the infants find more puzzling about, e.g., the agent searching for the object in

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packing it into the seemingly innocuous notion of recognition. When a rich understanding of how agents recognize signals is employed, there is evidence to show that something like the intention for the audience to recognize the intention to produce a response' (Thompson, 2007, p. 85). Given that there may be creatures who *do* communicate in this fashion (perhaps chimpanzees)—i.e. they repeat the same behavior without modification, do not track eye gaze or seek to maintain it, and ignore the impact of previous communicative contexts—it is important to note that children are not limited in this way regarding recognition, even from a very young age.

<sup>20</sup> Hutto has much to say about the ontogenesis of mindreading and folk psychology, but he greatly underestimates just how much these implicit false belief tasks undermine that story and his narrative-centric theory (see Thompson, 2012).

the new location (having not seen it switch), as opposed to when they search for it where they last saw it, one has to attribute both a belief about its location and a desire to retrieve it that led to the searching behavior. The infants must already possess a substantial grasp of how these partners in motivational crime operate, despite Hutto's worries that a grasp of one or the other might appear separately in ontogeny or manifest itself singularly in the infant's understanding. Such an occurrence surely could have happened, but the evidence here suggests that it does not.

As aforementioned, it is crucial to keep in mind just how the indirect route bolsters the case that despite initial appearances, these young children do seem to grasp how reasons work in creatures with minds. Coupled with their grasp of the adequately complex intentions and their ability to interact with creatures in virtue of exploiting aspects of their mentality, even mastering the idea of communication as providing a *reason* for a change in their mental states seems within the reach of these infants. They seem to grasp the representational nature of the propositional attitudes involved and how they interrelate to lead to behavior via interlocking contents.

The relationship between communicative intentions and the representational nature of the other propositional attitudes is crucial to keep in mind. If one neglects it, attempts to minimize the sophistication of the communicative intentions in early communication become much more plausible than they should be. If the rest of the propositional attitudes were unable to be grasped in the representational way, especially the core cases of beliefs and desires that combine to form the basis of intentions and reasons, then the communicative acts of the children at early stages in their communicative behavior *would* appear to be vastly over-interpreted if understood in the Gricean way. By not stressing the interrelation of these mental states, Neo-Gricean accounts fail to highlight the theoretical unity of their account and leave themselves open to attack on these sorts of empirical grounds.

## 6. Too Much, Too Soon?

I hope to have demonstrated that enough mindreading and a requisite understanding of communicative intentions are present early enough in linguistic development to make Neo-Gricean accounts plausible. But, surely some readers will want to know more about how such young children could possibly come to know so much about such complicated mental states at such an early age. They may allow that this evidence shows that some sort of understanding about agents is present but insist that it is of another *kind* altogether. As Gricean and anti-Gricean as their commitments may be, the following theorists have tried to argue for this sort of dichotomy of understanding, i.e., for some sort of two-systems account of this competence, describing these infant capacities as manifestations of an ontogenetically (and often phylogenetically) earlier (or more basic) knowledge or system, whether that dichotomy involves a *practical, lived, sensorimotor* understanding

versus a *reflective* understanding (Racine and Carpendale, 2007); an understanding of *intentional* agents versus an understanding of *mental* agents (Tomasello and Rakoczy, 2003); a *situation* theory of mind versus a *representational* theory of mind (Perner, 1991); an understanding others in terms of *intentional* attitudes versus an understanding of others in terms of *propositional* attitudes (Hutto, 2008); or any one of the System-1/Low-level versus System-2/High-level views on offer (Carruthers, 2009; Apperly and Butterfill, 2009; Apperly, 2011).

This is certainly not the place to address all of these disparate proposals. Indeed, I will not argue against the claim that something like these different systems or types of knowledge emerge earlier than the other ontogenetically (or perhaps phylogenetically). What is important for my current purposes, however, is that we find a way of allowing for the possibility that the more advanced mentalistic understanding is what is actually driving this infant behavior, and not some earlier, more basic competence. Hence, I will leave open the possibility that the more basic competence may have emerged even earlier, or may drive other behaviors at this age (hence, there is much to gain from such proposals, not just the Gricean ones). But in order to overcome at least some of the incredulity towards the proposals made in this article, I want to sketch a couple of ways that the more advanced understanding could be involved at such early ages. These sketches offer important alternatives to the various two-systems accounts currently available for the ages in question.

Though Neo-Gricean accounts are sometimes thought to be in conflict with some social or embedded views of social cognition, a consideration of the scaffolding surrounding these infants in communicative situations can make the emergence of some robust mindreading less abrupt, and, hence, more plausibly integrated into the infant's life (and into our own views about their lives). In what follows, I borrow some suggestions from Neo-Griceans, but they should not be saddled with my use of them for these bootstrapping considerations, or any of the claims or timelines I suggest.

Csibra (2010) develops a broadly Gricean account of meaning and seeks a more detailed account of how such young infants might plausibly transform into such mentalistically rich Gricean communicators. In order to do this, he explores rudimentary forms of signaling that emerge extremely early in ontogeny that might allow the child to bootstrap into a full Gricean communicator by offering a bridge between signals that merely need to be decoded and those signals that must be inferentially unpacked in a Gricean manner (his ideas influenced Moore's view (in section §3.1), and should resonate with the Gricean picture developed here).

The key element of Csibra's theory (in the terminology of Relevance theory) is that in certain cases 'one can recognize the [communicative] intention to make an informative intention manifest without, or before, recovering or inferring the content of the latter intention' (2010, p. 143). It is possible, then, to infer that someone is trying to communicate with you, i.e. you can recognize that they are trying to make a communicative intention manifest between you, without being able to grasp the content of what they are trying to communicate as specified by the additional informative intention. Csibra explains that since these two types of

intentions can come apart, 'One can attribute a communicative intention to the communicator by recognizing the ostensive nature of his action, and then, in a successive process, can attempt to infer the content of the implied informative intention' (2010, p. 143). The separation of these two acts of recovery offers some assistance in seeing how these young infants might come to grasp such complicated intentions at such an early age. The problem of *inferring* the informative intention does not arise for them in the Gricean way since the signals they are able to recognize at this point are not discovered through a laborious inferential process. These signals are straightforwardly decoded by the children in their first few months of life so that they can come to grips with the rudimentary aspects of how ostensive intentions work before having to recover the complicated content of non-decoded signals, as described by Grice. As Csibra puts it, the key is that 'recognizing communicative intentions (in the sense of noticing their presence rather than accessing their content) is not the outcome but one of the sources of the development of communicative skills' (p. 144). Csibra gives three examples of these sorts of ostensive signals to which even these young infants are sensitive—eye contact, infant-directed speech, and contingent reactivity in early turn-taking behavior (e.g. sucking behavior). It is due to the early-emerging comprehension of the meanings of these signals that allows the child eventually to become properly sensitive to the complicated nature of the higher-order communicative signals. The infants come ready-made to grasp these as signals of an intention to communicate with them. A brief look at infant-directed speech will make the proposal clearer.

Preverbal infants are placed in a difficult situation. They are surrounded by all sorts of human speech and must somehow filter out almost all of it in order to be able to tell when a special bit of that speech is actually directed towards them in a communicative act. Csibra suggests that this problem is solved for the infant in large part because adults alter the prosody of their infant-directed speech, or 'motherese'. By slowing down this typically high-pitched speech and giving it broader amplitude and pitch variation, according to Csibra, the parents are giving a special sort of easily decodable, i.e. ostensive, signal to which the child may selectively attend. This intonation pattern '*makes it manifest that the speech is infant-directed*' leading to 'easy and fast detection of, preferential orientation to, and positive affect towards the source of such stimuli' (p. 148, emphasis in original). By being able to decode these communicative signals, rather than infer them in something resembling the more iterative Gricean manner, these infants are able to grasp communicative intentions before being able to grasp the informative intentions that specify the informational content (that will soon be recognized by the infants as accompanying those intentions). By first mastering these communicative signals, the children, as they age, will be able to turn their attention to discovering the fact that signaling behavior can be used to inform them as well, thereby paving the way for the older children to discover the informational content in something like the Gricean manner. According to Csibra, eye-gaze and rudimentary turn-taking play similar roles, but in the visual and tactile channels, respectively, rather than the auditory channel.

Tomasello (2008) offers a plausible next step along the ontogenetic path. As the signals sent between the infants and their caregivers get more complex and require greater inferential power in order to divine the communicative intentions behind them, more robust mindreading is required. For such young children, the range of messages would seem to be boundless, no matter how robust their mindreading might be. This is a fact about communication that seems daunting, but since children do figure out these messages, chances are they have some sort of assistance from their surroundings. Indeed, one possibility is that the environment is scaffolded around them and this enables their mentalistic (though still fledgling) Theory of Mind to solve the problem at hand, i.e. unpack or infer more complicated messages with the help of this scaffolding.

The existence of this scaffolding does tell us something about the limits of Theory of Mind at this age and its operation, but nothing about this need suggest that the understanding that is deployed in these situations is not deeply mentalistic. Theory of Mind can fully function in an age appropriate way, but only in the right sorts of scaffolded situations or contexts. These contexts, what we might call *interaction schemata* (Tomasello, 2008, p. 157), allow not for a nonmentalistic understanding to succeed and grow, but rather, a mentalistic understanding. These ‘routine collaborative interactions with mature speakers of a language’ (e.g. eating in a high chair, feeding ducks in a pond together, building a block tower together), as well as other activity-oriented joint attention triangles, help the child understand the goals and intentions of the adult within that context or scheme so that the child’s attention can be focused on the communicative acts generated within those schemes (Tomasello, 2008, pp. 157–161). If not for these zones of development, it would be difficult to see how children could ever get a grasp of how to narrow the search space in order to infer the communicative intentions of growing informational complexity. But, given that these schemata exist and rudimentary communication can be winnowed down to its Gricean roots early in development, the infants grow into children who can begin to apply their mentalistic Theory of Mind in these conditions of language acquisition, as well as other schemata, and eventually begin to utilize them in less-scaffolded situations. This, of course, is only a thumbnail sketch of this process, but it hints at the sorts of resources that might make this sort of deeper mentalizing less miraculous, and more of a socially critical activity for young mentalizers and communicators in human communities. Instead of postulating the existence of an isolated, basic sort of understanding of agents in an otherwise hostile world, one can explore the possibility that a more nuanced understanding of agents can be present and develop with the help of more socially simplified, protected interactions.

## 7. Implications and Conclusion

I hope to accomplish three broad goals with this article. First, an increased interest in the abundance of context-sensitive expressions in natural languages has led

many theorists to debate the extent to which some of these expressions could be *intention-sensitive* (Borg, 2012). Minimalist theories of adult semantic competence may have tried to downplay the role of communicative intentions in their accounts of these expressions by appealing to these sorts of concerns about early semantic competence (see Cappelen and Lepore, 2005 and Borg, 2004). By defeating this developmental worry, I hope to focus more attention on the pressing issues for *semantic* theories—exactly what these intentions are like, how much of a role they play in semantics, and how semantics can avoid collapsing into pragmatics, if intentions do play the role that the evidence suggests that they play. Second, many theorists (especially philosophers) have paid too much attention to when children mastered *belief* in a particular way, and have largely ignored when children understand *intentions*. The evidence I review here makes a compelling case that children understand an incredible amount of information about other minds, from a remarkably early age, including understanding both how intentions and beliefs function. Third, Neo-Gricean accounts continue to be dismissed because of these worries about development. These accounts may have significant drawbacks, but I want to show that a plausible ontogenetic account is available to Neo-Griceans.

I have argued that there are no substantial developmental concerns that cast serious doubt on Neo-Gricean accounts, though much more research needs to be done before a fully satisfactory story of linguistic development and its relationship to mindreading is complete. The young children in question fail to count as a population who uses language without grasping the requisite psychological states. At bottom, I hope to have highlighted the following feature about social cognition: that even when researchers move beyond beliefs to explore intentions, communicative intentions are an especially interesting sort of mental state, one which seems to be understood at an especially early point in development, even when compared to the understanding of other intentions. Hopefully, these considerations will remove some impediments to further exploration into the real relationship between social cognition, communication, and human semantic competence.

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