

## I. Introduction

A recurring, Sellarsian theme in Jay Rosenberg's work, from his first book *Linguistic Representation* to his last, *Wilfrid Sellars: Fusing the Images*, concerns the uniqueness of human linguistic and mental representation and its distinctness from all forms of animal communication and mentation. Full-fledged human language and thought, so the theme goes, is compositionally structured, intentional, rational, and subject to social norms. It is not merely patterned behavior that is goal- or need-driven, world-directed, and subject to modification via behavioral control or manipulation by co-communicators. Human linguistic communication is different from any known form of non-human communication in being the province of rational agents who act and think within *the space of reasons* (to use a bit of familiar Sellarsian jargon). Consequently, all application of our concepts of meaning, semantic content, propositional attitudes, etc. to non-human creatures is at best a matter of analogy, or metaphorical extension.

Today we'd like to do a bit of philosophical work of our own on this fascinating theme, which for me (DB) is a very apt one here. When I first came to UNC as a visitor – a visit arranged by Jay who was then department chair – I gave a talk on the possibility of a solitary language, which was in good part a response to an argument from Jay's *Linguistic Representation* to the effect that language is essentially a social-normative phenomenon. Although animal communication was not my direct concern in that paper, ensuing discussions with Jay brought out what seemed to me the most problematic commitment of the 'socialist' view: a commitment to a fundamental *discontinuity* between the non-human and the human. I feel a great intellectual debt to Jay for patiently – well, not always so patiently... – educating me over the years on the depth and force of this commitment. For my part, anyway, this paper is a small installment in a larger payment plan.

Our aim in what follows is to engage a number of claims made by Rosenberg and other Sellarsians regarding what separates our systems of communication from any seeming analogues or precursors of it in the non-human animal kingdom. We think that both opponents and proponents of the Continuity view (as we shall call it, for short) have been excessively focused on the informational-representational aspects of communication.<sup>1</sup> Our modest goal here will be to commend to the attention of both sides a rich and complex yet under-studied domain of behavior – *expressive behavior*. Proper study of expressive behavior, we believe, promises to illuminate important and perhaps unexpected ways in which the linguistic and non-linguistic may lie on a natural continuum.

## II. A Gricean Route from the Natural to the Non-natural

First a detour through familiar territory. A sentence of English, such as “It’s raining”, tells of a particular worldly condition. In its normal use, it expresses the proposition (or thought) that it’s raining at a certain time in the vicinity of the speaker in virtue of the *linguistic meaning* of that English sentence. Ever since Plato’s *Cratylus*, philosophers generally accept a sharp chasm between the way a sentence is paired up with a particular meaning, on the one hand, and the way, say, the appearance of dark clouds in the sky is ‘paired up’ with rainy conditions. Loosely speaking, both the sentence “It’s raining” and the clouds may be said to *represent* rain, or convey information about its imminent presence. But they do so in radically different ways. For Grice (1957), the clouds represent rain in virtue of a *natural* relation – a stable correlation between the presence of dark clouds and the coming of rain – which allows informed observers to treat the former as a *reliable indicator* of the latter. By contrast, a typical utterance of the English sentence exhibits *nonnatural meaning*: representing rain in virtue of a convention or rule associating the sound ‘rain’ with rain, and being uttered with certain intentions. What Strawson (1970) dubs the *communication-intention* approach purports to explicate nonnatural meaning, and then conventional meaning, in psychological terms: speakers invest

linguistic signs with meaning by tokening them with certain communicative intentions; repetition and public use then ossify them into conventionally meaningful symbols.

Commenting on Grice's program, Strawson contrasts the communication-intention approach with that of formal semantics, in which linguistic meaning is to be elucidated in terms of a systematic pairing of sentences with their truth-conditions. Strawson's main claim in "Meaning and Truth" is that this Davidsonian thesis, though true and potentially illuminating, simply doesn't go deep enough. We have, of course, the platitude that a speaker "makes a true statement or assertion if and only if things are as, in making that statement, he states them to be" (p. 180). But Strawson insists that we now need an understanding of what it is to make a statement or an assertion. And he agrees with the communication-intention theorist that this requires appeal to speakers' intentions of "letting an audience know, or getting it to think, that the speaker has a certain belief." (1970: 181). The explanatory work, then, is ultimately done not by the notion of truth, but by the notion of special audience-directed communicative intentions.<sup>ii</sup>

In a critical discussion of Strawson, McDowell (1983) expresses sympathy to the idea that a "general account of how language functions" requires making it clear "that speaking and understanding are primarily the issuing and reception of communication" (p.36) (although McDowell rejects the Gricean assumption that nonnatural meaning can be *reductively* explained via communicative intentions). McDowell's discussion is of interest to us here because of how he characterizes the "essentially communicative" character of language. In developing the idea, McDowell turns to "modes of behaviour that we can ascribe to creatures to which we would not think of ascribing intentional action" (p.40). He says,

A bird, say, might instinctively emit a characteristic sort of squawk on seeing a predator; other birds might acquire[, on hearing such a squawk,] a propensity towards behaviour appropriate

to the proximity of a predator [(flight, increased caution in feeding, or whatever)]. This propensity might match a propensity they would have acquired if they had seen the predator themselves... there is no risk of over-psychologizing our account of the birds [– crediting them with an inner life –] if we regard such behaviour as effecting the transmission of information, and hence as constituting a kind of communication. (p. 40)

What separates *linguistic* behavior from “this kind of information-transmission”, McDowell continues, is the fact that the former is “wholly overt”: “In successful linguistic exchange speaker and hearer are mutually aware of the speaker’s intentions, in a way that could have no counterpart in merely instinctive responses to stimuli.” (p. 40f.)

One might doubt whether intentions to produce an effect on an audience are essential to speaker meaning. One of us (Green 2007) has argued elsewhere that they are not. Even if that argument succeeds, however, speaker meaning would still represent a pretty impressive cognitive achievement. Further, given the paucity of evidence for compositional complexity in signals used by birds, primates, and the like, we face a rather large gap between what the more sophisticated animals can do and what even normal pre-k human children are capable of. Yet any naturalistically-minded philosopher will feel sure that the gap was not traversed with divine aid. It turns out that Grice worried about this problem, so let’s look briefly at what he had to say about it.

### **III. The Continuity of Natural and Non-natural Meaning: Grice’s Myth of X<sup>iii</sup>**

In “Meaning” (1957), Grice aimed to capture the *difference* between natural and nonnatural meaning, and, at least on standard interpretations, proposed a conceptual analysis of nonnatural meaning. By contrast, in his 1989 “Meaning Revisited”, Grice attempts to portray “nonnatural meaning as descendant [and] ... derivative from ... cases of natural meaning” (1989: 292). In that article Grice can be seen as answering a question closely related to our main concern here, namely:

How could nonnatural meaning, as paradigmatically exemplified in human communication, arise in a world of natural signs? In response, Grice offers a story about how a creature, X, who has a relatively rich behavioral repertoire, bits of which have natural meaning, could “end up with something which is very much like nonnatural meaning” (*ibid.*). As construed by one of us (Bar-On 1995), this Myth (call it “the Myth of X”) is not put forth as a conceptual analysis, or reductive explanation, but is instead a diachronic, or ‘genetic’ Continuity story portraying linguistic meaningfulness as lying on a continuum that goes from natural meaning through individual speaker meaning to full-blown conventional linguistic meaning.

Grice’s Myth begins with a creature X who nonvoluntarily produces a certain piece of behavior that naturally indicates that X is in some state (say, pain) and takes him through six stages that would allow him “to end up with something ... very much like nonnatural meaning” (1989: 292). At the first stage, X comes to produce *voluntarily* behavior of the sort whose nonvoluntary production would naturally indicate that X is in the relevant state (for example, X might *emit* a yelp to get his audience, Y, to come to think he’s in pain). In a characteristic fashion, Grice then imagines that X’s audience, Y, *recognizes* that X’s performance is voluntary, and can see it as *open* (or “wholly overt”, to use McDowell’s phrase): although X’s behavior is ‘put on’, he’s letting Y see that it is put on and Y realizes it. The next stages have X and Y involved in a complicated game of transmitting and receiving information in which X not only intends Y to recognize his communicative intention, but also intends Y to take this intention to be a sufficient reason for believing that he, X, is in the relevant state. At the final stage, X reverts to producing some vehicle of communication – a bit of behavior or device – which is *not* a natural sign, but is more loosely connected to the message to be conveyed, discernibly by Y. At this final stage, we have a communication vehicle invested with speaker meaning as Grice conceives it. Once a repertoire of

such communication vehicles is developed, our creature may well be on his way to linguistic meaning as we know it.

Here then we have *a* continuity story. But would it satisfy the Sellarsian skeptic? An obvious difficulty is that the story requires imputing to X very complicated other-directed intentions; to use contemporary parlance, X must possess a pretty complex ‘theory of mind’ with nested ‘metarepresentations’. How feasible is it to attribute these Gricean intentions to nonhuman animals, or even to a human in a languageless ‘state of nature’ (or to a prelinguistic child, for that matter)?

Following Sellars, Jay raises a related objection, but one which seems to strike deeper at the heart of what he calls “agent semantics”. As he puts it:

If thought *is* a representational system analogous to public language, then it cannot be appealed to *explain* how representational systems succeed in representating a world. Whatever the merits of agent semantics as a component in an account of public linguistic *performances*, the analysis of *representation* must be conducted at a level undercutting the distinction between the overt and the covert, between public language and thought. (1974: 28)

The deeper problem is, briefly, that [as long as we take thoughts, beliefs, intentions, etc. to have structured semantic contents, we seem to deprive the Gricean of a nonsemantic, purely psychological foundation on which to construct even a ‘genetic’ Continuity story of the emergence of linguistic meaning. For] the Myth of X requires that at the stage prior to the emergence of nonnatural meaning there be creatures capable of certain thoughts, intentions, beliefs with propositional content. But possession of these already requires a system of mental representations that are semantically ‘analogous to public language’. So the Myth can at best help us understand the emergence of linguistic systems with nonnatural semantic properties only by appealing to mental systems with analogous semantic properties.

But perhaps, as some “content functionalists” believe, one *could* account for the semantic properties of at least more basic propositional attitudes – ones that precede nonnatural meaning in the natural order – *without* invoking nonnatural semantic properties of mental representations. The idea here is that the *content* of so-called primitive psychological states (and not just their attitudinal profile, as e.g. beliefs vs. desires) can be fixed by the functional roles they play in the cognitive economy of a creature. So, for example, a creature lacking semantically structured mental representation system may perhaps still be said to be in an internal state which qualifies as a primitive belief that there’s food about (or that there’s something edible here, or ...) simply because that state is caused by the presence of food and causes certain specific kinds of pursuing behavior (as well as other creaturely states). If so, then the Gricean could suggest that the transition to nonnatural meaning becomes possible once a languageless creature possessed of primitively contentful mental states hits upon the idea of communicating their presence to her fellows in a special, Gricean way.

Of course, it’s far from clear how to understand this transition, or why we should find it less problematic than the transition envisaged by the original Myth of X. In any event, we suspect that the idea of bringing primitive thought to Grice’s rescue would not meet with much approval in the present mixed company of committed Sellarsian [rationalists] and mad-dog semantic externalists... The former would balk at the failure of primitive thoughts to be properly ensconced within the ‘space of reasons’, and thus to be genuine *thoughts*. And the latter will complain that primitive thoughts fail to have the right ‘vertical’ links to the worldly things they are about, and thus fail to have genuine *semantic content*. Fortunately for us, we don’t have to be caught in this cross-fire. Or so we will try to convince.

#### IV. Lionspeak, Expression, and Communication

You may have noticed that Grice's mythical X bears little resemblance to the sorts of animals ethologists study, that is, *real* animals, in whom we can discern sophisticated communicative repertoires without (apparently, at least) needing to attribute highly complex cognitive states, including other-directed nested intentions. (Indeed, X doesn't seem to bear much resemblance to most humans – he comes across as pretty English...) In what follows, we would like to draw attention to a special kind of communicative behavior: *expressive behavior*, which does not require reflexive communicative intentions yet exhibits richness and sophistication of a sort that may support a plausible Continuity story.

In an elegant short piece, “Speaking Lions”, in the course of reflecting on Wittgenstein's dictum “If a lion could speak, we could not understand him”, Jay turns to consider natural expressions of pain. He contrasts such expressions with truth-assessable reports, remarking:

About expressive behavior – about writhing and groaning, wincing and limping – I can ask only whether it be genuine or feigned, authentic or mere pretense. ... No claim to truth has been made. Something is being done, not said. (p. 158)

Recall that Grice, too, assigns a pivotal role for expressive behavior in his Myth of X: what initially puts X on his road to nonnatural speaker meaning is his nonvoluntarily wincing in pain. Similarly, an implicit suggestion of Jay's paper appears to be that what may put us on our way to understanding a lion is not the deciphering of reports made in Lionspeak, but rather becoming able to read the lion's expressive behavior. [Or at any rate, that whatever problem there is with understanding a lion, it would have to do, in the first instance, with ‘taking the measure of a lion’ \(as Jay puts it\), which is a matter of being at home with how he expresses himself.](#) If this is the suggestion, then we'd like to agree.

The domain of expressive behavior, though, is heterogenous. In addition to so-called natural expressions (i.e., vocal sounds, facial expressions, bodily demeanor or gestures, etc.), where the connection to the expressed states is set up by nature, there are behaviors such as tipping one's hat, shaking hands, showing a finger, and so on. As Jay points out, I can express my pain not only by wincing or writhing; I can say: "Ouch!" or "This hurts!", or avow "I'm in pain". There is a sense in which in all these cases what is *done* – the *act* I perform – is the same: I give vent to my pain. But in each case I use a different *expressive vehicle*. We will find this distinction useful below. Following Sellars (1969), we can also distinguish between, on the one hand, the way in which a bit of behavior expresses an expressor's *state of mind*, on the one hand, and the way in which a *sentence* expresses a *proposition* by virtue of being a conventional representation of it.<sup>iv</sup>

So-called natural expressions -- behaviors such as baring teeth, grunting, scowling, blushing, clenching fists, trembling, tearing up, intonational fluctuations – typically do not require performing any action intentionally. These are behaviors that biologists would describe as automatic, rather than consciously undertaken or willed;<sup>v</sup> and they are directly caused by the state they express. Nonetheless, we would argue that naturally expressive behavior is interestingly different from mere reliable indication, like smoke, or deer tracks, as well as physiological symptoms, like red spots, or sneezes. Natural expressions, on our view, form a special sub-category within the Gricean category of natural meaning.

Some apparatus from the evolutionary biology of communication will help clarify this point. A core issue in that field concerns the conditions under which signaling systems are *stable*. Where signalers' interests are at least roughly coordinate, they have no incentive to deceive one another. Humans and honeyguide birds (*Indicator indicator*), for instance, depend on one another to find and destroy beehives, and neither has a motive for deception (Isack and Reyer 1989). As a result, we may expect honeyguide signals directed toward humans to be reliable. In more agonistic situations,

creatures derive an advantage from deceptive signaling. To escape predation some anurans bear bright colors even when they are neither poisonous nor noxious. Although in any given case a signal can misrepresent, the stability over time of any signaling system mandates that it be on the whole reliable. The proliferation of “cheating” frogs, who bear bright colors without being noxious, would threaten, over time, to make frog coloration something predators can ignore. Natural selection thus tends to find ways of vouchsafing the veracity of signals among creatures whose interests are not coordinate.

To help articulate this last thought, here is some terminology. A *cue* is any feature of an entity that conveys information (including misinformation). That information might pertain to how things were, how things are, how things will be, or how things ought to be.<sup>vi</sup> A *signal* is a cue that was designed for its ability to convey the information it does. The design in question may be the result of natural selection, artificial selection, or conscious intention. Not all signals are reliable, but for those that are, their reliability is sometimes vouchsafed in beautifully simple ways. For instance, funnel-web spiders, *Agelenopsis aperta*, find themselves in contests over webs. Two spiders will vibrate on a disputed web. Reichert 1984 found that if two contesting spiders differ in weight by 10% or more, the lighter spider retreats 90% of the time rather than fighting. Furthermore, a losing spider can be made into a winner by placing a weight on its back. This strongly suggests that vibrating on a web is a spider’s signal of its size. What’s more, in the absence of scientists placing weights on their backs, funnel-web spiders can’t fake these signals. Signals that can only be faked with great difficulty as a result of physical limitations on the organism are *indices*.

An index not only signals some property of the organism; it also shows that property: the extent of the spider’s vibration shows the spider’s size, and thereby its recourse holding potential (RHP). Further, it is its ability to show, rather than merely signal, this property that vouchsafes the stability of this signaling strategy. Now if natural expressions are signals, then they are not merely

behavioral symptoms of the mental states that cause them: instead, they are a species of communicative behavior. The organisms we encounter in our natural environment all exhibit symptoms of various conditions they are in; but not all organisms exhibit behavior *designed* to communicate the presence and character of their conditions to some designated audience. Expressive behavior does just this. What's more, intuitively we think of expression as showing what's within the expressor: In expressing my anger I show it, and so on for many other cognitive, affective and experiential states. If this is right, then given what we've said thus far, a natural expression is also an index.

Expressive behavior may be automatic rather than willed, and may even happen against one's will rather than in accordance with it. In expressive behavior a creature manifests or displays various aspects of its inner life, be it an emotion, a cognitive state, or an experiential state. That "inner life", however, typically will have its own complexity. For instance, a state of fear will embody a certain disposition to act, but will also be directed upon some object or state of affairs, thereby exhibiting a familiar duality of modality and content. Expressing one's fear, then, might involve indexing both dimensions of this affective state. The "modality" side might be indexed with a facial expression or tone of voice; the "content" side might be indexed with a way of drawing a viewer's attention to the object of that fear: a predator, a fire, or what have you. One might draw attention to that thing with a gesture, bodily orientation, or even something as simple as gaze. Put together a directed gaze with a terrified face and a shriek, and you have a pretty good approximation to a creature expressing its fear of something particular—for instance its *hawk-terror*.

What makes expressive behavior reliable, that is, an index rather than just a signal? Sometimes its reliability is due to its automaticity: many expressive behaviors simply befall us and other creatures, and their occurrence is for that reason a reliable indication of what they signal. (Think of blushing and tears for the non-thespian human case.) In addition, note that expressive

behavior is the stock-in-trade of social creatures. Among the more sophisticated social creatures, various members of a group have one or another kind of standing or *status*. Social mammals such as wolves, baboons, and many others are hierarchical, so that one's status in a group is all-important. That status will determine things like feeding order, mate choice and grooming protocols, and among many social creatures, a creature's reliability in signaling is followed as well.<sup>vii</sup> Reliability in expressive behavior will, then, be secured in a "crying wolf" way: Those who are unreliable are eventually called out, whence those who have not been can be presumed reliable. (In the next section we'll briefly illustrate this point for the avian case.)

We maintain, then, that naturally expressive behavior is behavior *designed* (in a biological sense) *to show* the presence, kind, degree and object of an expressor's states of mind to suitably endowed natural consumers/recipients (typically, conspecifics). Yet the structure and success of expressive behavior requires neither communicative intentions nor cognitively sophisticated interpretation. Natural expressions can show the presence and character of an animal's state without the animal *intending* to tell that things are thus and so—indeed without having a concept of other minds at all. Further, insofar as natural expressions are products of co-evolution between signaler and receiver, recipients of such expressions may also exploit sensitivities thereto without conscious or intentional intervention. The production and uptake of naturally expressive behavior thus place considerably weaker demands on the cognitive capacities of the expressor as well as the recipient, than, e.g., Grice places on creature X and his audience.

So far we've described behaviors ethologists call *emotional displays*, which are routinely contrasted with behaviors that have proper *semantics* (or are at least '*functionally referential*'). Using our earlier terminology, an emotional display is an act that expresses a creature's *state*, but its *product* – a certain behavioral pattern – is not like an English sentence; it does *not* express a proposition. Yet as we saw, so-called emotional displays are *janus-faced*: a frightened facial expression manifests the

animal's *state* of fear, pointing inwards, as it were; but with the aid of direction of gaze, it also draws attention outward, to the fear's intentional object. This allows expressive behavior to acquire at least *proto-semantic* properties. In the next section, we draw out this line of thought a bit by focusing on avian calls.<sup>viii</sup> Understood as acts, these calls can be seen as expressing an animal's intentional state -- a state *directed at* a specific object or situation. But we can abstract from these acts alarm calls considered as products -- i.e. as distinctive 'signature' vocal patterns, which can be reproduced in the absence of the original expressor.<sup>ix</sup> As such, they possess representational autonomy; for they can gain currency as 'stand-ins' for different sources of threat (e.g., leopards vs. eagles).

### **Section V: Avian Calls as a Case Study in Expressive Behavior**

In a survey of a half-century of ethological research, Marler (2004) considers various forms of *bird calls* (as distinct from bird songs, which tends to be longer and more acoustically complex). In the chaffinch, calls have the following functions: courtship, aggression, predator alarm, announcement and exchange of food, distress, and group proximity maintenance. (There may also be a 'regenruf', predicting rain.) In the domestic chicken we find a repertoire of about eighteen calls, including those for aerial predators and food. Discussing the predator alarm call across species, Marler writes,

If a sudden predatory threat is detected nearby, the most logical response might seem to be to dash for the nearest cover, to freeze, and above all to keep quiet. **This is indeed an accurate description of a few birds...but for one striking fact. Birds that keep silent, whatever the danger, are very much in a minority.** It is a mark of avian sociality that almost all birds possess alarm calls as key components in their suite of antipredator responses. (2004, p. 138).

Marler notes that in some species a given call can double as an alarm or contact call. In other species, the call contains an acoustic signature identifying the caller; in others, not. Again, some of

the acoustic features of calls can be predicted by their function. For instance, Marler observes that a predator alarm call should be, and in fact typically is, designed in such a way as to make detection of the caller difficult. (It tends to be a narrowband pure tone, and pitched high in a range where hawks cannot hear very well.) Indeed, many species have converged on the “seet” alarm for aerial predators.

Many birds, including galliforms, use food calls, and among domestic chickens the rooster calls to females to offer morsels of food. Evans and Evans (1990, 2007) also document that roosters sometimes call deceptively, holding a twig in their beak while calling to a female. What is more, for a short period (up to 24 hours) females seem to remember having been deceived, and respond to deceiving males less eagerly.

Birds often vocalize during or prior to aggression in addition to exhibiting the well-known “head forward” display. The vocalization tends to be in a lower register, and the lowness of register is correlated with body size and thus RHP. This suggests that aggressive vocalizations are indices in the sense we defined above.

Marler suggests that some calls are “functionally referential”, while others such as alarm and aggression calls behave more like emotional displays (2004: 175). Rather than infer that the latter are comparatively impoverished, Marler makes a fascinating suggestion:

With careful study, we find that communication by emotional displays can be very complex, especially when prevarication is involved...Furthermore, if a bird couples a call with some kind of indexing behavior, such as head-pointing or gaze direction, a certain object or point in space or particular group member can be precisely specified: the combination adds significantly to the communicative potential of emotion-based signals. (176)

This is very close to the picture we have been developing here. Even without head-pointing or gaze, an alarm call, for instance, directed at a particular predator, is a great deal like “Eagle!”

(uttered fearfully), in the following ways: It is an expression of an affective state, but because that state is itself complex (containing both a modality and a content), this leaves open the possibility that it expresses both of these things. Marler's suggestion, which we endorse, is that the bird alarm call can and often does express not only the creature's fear but also the fear's intentional content. Similar points apply to calls of aggression, as well as to hens' food calls.

A credible Continuity story must show us how to traverse the palpable distance between the sort of rigid and programmed (albeit impressively complex) encoding that is characteristic of, say, bee dances, on the one hand, and the sort of complex communication speakers of a language routinely exhibit, on the other hand. Marler's birds, we think, are different from the bees, and, insofar as their behavior can be properly seen as expressive behavior, it may help see how the distance can be traversed. For we have argued that this special species of animal communicative behavior is not only richly informative and highly structured. It also betrays a certain kind of mindedness: it's behavior whose biological purpose is to enable creatures to show the presence, quality, and intentional object of an expressor's state of mind so that others (conspecifics or else a co-evolved receivers) can perceive it. At the same time, expressive behavior can show an expressor's state of mind without her *intending* or *trying* to communicate it; and it can serve its purpose without the intended recipient consciously *interpreting* the behavior or *discerning* the expressor's intentions. Thus, the production and consumption of expressive behavior need not require Gricean reflexive intentions nor need it be governed by Sellarsian rules of reasons. Herein lies its promise in supporting Continuity.

Note to DBO:

These last paras look quite good, but they don't make it clear what our objection to Millikan is. (Given that we abjure mindreading in a rich sense, for all the reader knows, we're siding with Millikan versus Origgi/Sperber.) I don't think that's a big problem for what we actually say, but we should at least be prepared to explain in q&a how we think we can improve on Millikan. I have a notion of "objectual meaning" that might be of use here. More generally, I suspect that the content that she posits in alarm calls (as including both propositional and imperatival dimensions) is richer than the ethological data mandate. Perhaps we can (in our discussions, and in the published paper) develop a bit an idea for a more austere reading of these calls that nevertheless doesn't "dumb them down"?

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<sup>i</sup> This is but one manifestation of the traditional preoccupation (not to say obsession) with the indicative, the assertoric, and the cognitive, in the realm of the philosophical understanding of language and thought.

<sup>ii</sup> For a useful summary, see McDowell (1983) §1.

<sup>iii</sup> Our discussion in this section follows closely Bar-On (1995).

<sup>iv</sup> [Give Sellars' 3-fold distinction]

<sup>v</sup> According to a recent suggestion – “the unbearable automaticity of being” – due to Bargh (200x), a great deal of our behavior, including our communicative behavior, is like that.

<sup>vi</sup> Strictly, whether something is a cue, and of what, is relative both to the receiving organism and its ecological niche: My preferred usage is *C cues information I relative to receiver R in niche N*. That is why paw prints are cues of a predator's presence for you or me but not for an aphid; it is also why pheromones are cues of an ant's presence for aphids but not for you or me. Nevertheless, to facilitate presentation I shall elide these details in the text below.

<sup>vii</sup> Cheney and Seyfarth 1988, 1990. For a detailed study of social hierarchies among baboons, see Cheney and Seyfarth 2007.