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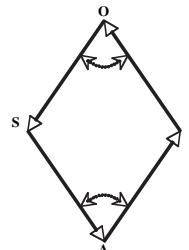
# Meaning, motivation, and mind: Some conditions and consequences for the flexibility and intersubjectivity of cognitive processes

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## A B S T R A C T

This essay takes up the concerns of Vygotsky using the categories of Peirce; and it uses these concerns and categories to re-map some of the terrain explored by analytic philosophy and cognitive science. In particular, the central concern is the flexibility of cognitive processes, as created by the interplay of tool and symbol, and as constituting of the relation between organism and environment. The central categories are object, sign and interpretant (qua meaning or 'symbol') and agent, means and ends (qua motivation or 'tool'). And the terrain to be re-mapped is intentionality, or the nature of mental states and speech acts (qua 'Mind'). Finally, this essay has a particular expository strategy: to capture the fundamental features of such cognitive processes, as objects, by using a relatively generative system of diagrammatic signs. All this, then, is a way of tackling human-specific modes of agency—loosely understood as the flexibility and intersubjectivity of cognitive processes underlying means-ends reasoning.



Motivated Agent and Meaningful Object

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## 1. Introduction

In the first section, meaning and motivation are carefully defined: the first as a relation between objects, signs and interpretants; and the second as a relation between agents, means, and ends. It is argued that neither one may be properly understood without the other; and that both are required to

understand the relation between organisms and environments. Here, then, a relatively narrow, but fundamental, sense of agency is introduced—one which may be used to understand any kind of life-form. In the next two sections, it is argued that intentionality, in the classic sense of Brentano (1955 [1874]), must be understood as an irreducible relation between meaning and motivation. Such an understanding of intentionality is used to reframe the nature of mental states and speech acts. And the relation between these is used to describe some human-specific properties of cognitive

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processes: displacement, inference, contextualization, incorporation, framing, embedding, enchainment, communication, commons, intersubjectivity, and so forth. Here, then, a relatively broad sense of agency is introduced, as a means to carefully specify key features underlying human-specific modes of creativity, or ‘generativity’.

In one guise or another, these concerns might be traced back to Aristotle, who took up similar concerns in his texts on categories, causes, the soul, and so on. In the tradition of analytic philosophy, Brentano’s account of intentionality, with its focus on representation and satisfaction, is loosely compatible. And Brentano’s children—latter philosophers of language and mind such as Frege, Wittgenstein (1981 [1921]), Anscombe (1959), Austin (2003 [1955]), Sellars (1997 [1956]), Grice (1989a, 1989b, 1989c), Davidson (1984), Searle (1983), Brandom (1994), and Millikan (2004)—treat related concerns in a century’s worth of celebrated texts. Indeed, these ideas might even be considered the foundational concerns of cognitive science, as evinced by the following quotes:

The prototype of a cognitive adaptation is a behavior adaptation in which perceptual and behavioral processes (1) are organized flexibly, with the individual organism making decisions among possible courses of action based on an assessment of the current situation in relation to its current goal; and (2) involve some kind of mental representation that goes “beyond the information given” to direct perception (Tomasello & Call, 1997:8).

The mentalist, in this traditional sense, need make no assumptions about the possible physiological basis for the mental reality that he studies. In particular, he need not deny that there is such a basis. One would guess, rather, that it is the mentalistic studies that will ultimately be of greatest value for the investigation of neurophysiological mechanisms, since they alone are concerned with determining abstractly the properties that such mechanisms much exhibit and the functions they must perform (Chomsky, 1965:193)

That is, cognitive processes are understood as flexibly organized mental representations, themselves grounded in neurophysiological mechanisms and grounding of behavioral practices. And, in studying such processes, cognitive scientists—or ‘mentalists’—seek to determine the properties such mechanism exhibit and the functions they perform, without necessarily making reference to neurophysiology. Loosely speaking, cognitive science (including within it loosely allied and pre-existing disciplines such as psychology, linguistics, and anthropology) turns on the functional specification of putative brain states; and these are understood as flexible representations underlying means-ends reasoning. *Enter meaning and motivation.*

Taking the foregoing points into consideration, the following account of cognitive processes may be understood in a variety of ways. First, rather than enlisting the categories and arguments of cognitive scientists or analytic philosophers, it borrows key categories of Peirce (1955) to address key concerns of Vygotsky (1978): cognitive flexibility, created by the interplay of tool and symbol, and constituting of the relations between organism and environment and self and other.

Second, Vygotsky was a master of capturing the creativity of human cognition by attending to the interplay of processes occurring on phylogenetic, historical, and developmental timescales.<sup>1</sup> In contrast to Vygotsky, however, the strategy is not to understand higher-order cognitive processes in terms of the interplay of ‘tool’ and ‘symbol’ (in their stereotypic senses, say, as a hammer or a noun); rather, it is to understand the representational and instrumental nature of somewhat lower-order cognitive processes—how meaning and motivation constitute the organism-environment interface of any life-form.

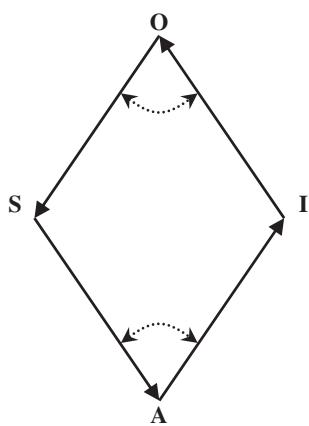
Third, Peirce’s analysis of meaning and mind predicated cognitive science by more than 50 years, and still offers a very compact and creative way for capturing key features of cognition. Nevertheless, the Peircean architecture will be relatively covert: the point is not to expound or expouse him, but rather to use some of his categories as a starting point. While no familiarity with his *categores* is required, readers interested in their relation to the public face of cognition, or semiosis more generally, may turn to the appendix for a brief review.

Fourth, in keeping with the tradition of both analytic philosophy and cognitive science, this essay might be understood as an attempt to understand the properties and functions of mental states and speech acts by reference to their failures. In other words, by looking at what exactly is amiss when such cognitive processes go awry, we can infer what properties and functions such possess actually processes.<sup>2</sup>

And finally, this essay has a particular expository strategy: to capture the fundamental features of such cognitive processes, as objects, by using a relatively generative system of diagrammatic signs. The point then is to draw out the ontological ramifications of a particular

<sup>1</sup> The Russian psychologist Lev Vygotsky (1978) has theorized the similarities between instruments and utterances (or, more generally, ‘tools’ and ‘symbols’). Each is a means for achieving some end: in the case of instruments, the end is physical (changing some state of affairs in the world); and in the case of utterances, the end is psychological (changing some mental state in the mind). Besides being externally and internally oriented in this way, each is an example of mediated activity: instruments mediate the relation between man and nature (or body and world); utterances mediate the relation between man and man (or mind and mind). These similarities notwithstanding, Vygotsky thinks that the parallels should not be taken too literally. Moreover, he thinks that there are other forms of mediated activity that are neither instruments nor utterances: for example, cognitive activity may be understood as using representations (or mental states) as a means to change representations; and it may be understood as mediating the relation between mind and world. Indeed, Vygotsky understands higher psychological activity as behavior that involves a combination of instruments and utterances (as well as representations). Finally, he theorizes various developmental pathways (which may be understood to occur in ontogenetic time, historical time, and phylogenetic time) whereby instruments (objectivity) become more like utterances (intersubjectivity) become more like representations (subjectivity). In this way, Vygotsky theorizes subjectivity as the internalization of objectivity through the path of intersubjectivity. It is exactly this processes that gives rise to human-specific modes of agency.

<sup>2</sup> Loosely speaking, such an account is at best only descriptively adequate: such properties and functions should ultimately be explained by reference to neurophysiological processes of a more causal and reductivist nature, as well as sociohistorical processes of a more holistic anti-reductivist nature.



**Fig. 1.** Selecting agent and significant object.

notional system: a basic set of entities, and relations between entities, relative to which both simple and complex cognitive processes may be described.

## 2. Motivation and meaning

We may start with a simple example. To understand *motivation*, focus on the bottom half of Fig. 1. Let *S* be the sight of a predator, *I* be a flight from that predator, and *A* be the prey that both sees and flees. In other words, there is a sensed event (*S*), there is an instigated event (*I*), and there is a sensing and instigating agent (*A*). We may say that *I* makes sense in the context of *S* from the standpoint of *A*.<sup>3</sup>

To understand *meaning*, focus on the top half of Fig. 1. Let *O* be the predator, *S* be a sign of that predator (as sensed by the prey), and *I* be an interpretant of this sign (as instigated by the prey). In other words, there is a sign event (*S*), there is an interpretant event (*I*), and there is a signed and interpreted object (*O*). We may say that *I* makes sense in the context of *S* given the properties of *O*.

An example that is closer to home is joint-attention. From one perspective, a child turning to observe what her mother is observing involves a sign (the parent's direction of attention), an interpretant (the child's change in attention), and an object (what the parent is attending to). From another perspective, such a process involves a sensed event (what the child sees), an instigated event (what the child does), and a sensing and instigating agent (the child herself).

Being an *agent* means two things. First, *A* is capable of sensation and instigation. More specifically, *A* is capable of being affected by events (that have causes outside of *A*), and capable of being causal of events (that have effects outside of *A*). Second, *A* is capable of selecting, or capable of being selected. In other words, to say something makes sense from the standpoint of *A* is to say that there is

a reason that *A* would have selected it, or have been selected for it. Selection may range from natural selection, through cultural sanctioning, to rational choice. Loosely speaking, it may turn on, or have as its telos, the survival of a species, the values of a group, or the goals of an individual.<sup>4</sup>

Objects are dependent on agents. In particular, an object is just a bundle of features relative to which an agent's sensations and instigations make sense (given some process of selection). In other words, an agent senses a feature (*S*) that is reliably correlated with an entity (*O*) that has a host of other features, and the event that the agent instigates (*I*) only makes sense in the context of one or more of those other features.<sup>5</sup> Thus, while one may see that it's a bear from its size and shape, one flees from it because of its speed and strength.<sup>6</sup>

More carefully defined, the key idea is this: Given the relation between the *O-S* relation and the *I-O* relation (which is external to *A*), the *A-I* relation makes sense in the context of the *S-A* relation (from the standpoint of *A*).<sup>7</sup> Thus, for the child (*A*) engaged in joint-attention, doing what she does (turning her head, or *A-I*) in the context of seeing what she sees (her mother's direction of attention, *S-A*) makes sense given the relation between what she'll come to see (*I-O*) and what her mother currently sees (*O-S*). This demonstrates the indivisibility of organism and environment: there exist two relations between relations (the dotted lines in Fig. 1), neither of which may be understood without reference to the other. Motivation and meaning are concomitant processes.<sup>8</sup>

This last point deserves a longer discussion. Terms like 'meaning' and 'information' are usually defined in terms of an *O-S* relation.<sup>9</sup> In particular, a sign *S* is reliably correlated with an object *O* (within some causal domain), such that knowing something about *S* allows one to know something about *O*. Thus, for the child, the direction of the mother's face, as a sign, is reliably correlated with an

<sup>4</sup> For example, *A* is a gene, *I* is a trait expressed by that gene, and *S* is an environment in which such an expressed trait makes sense. That is, given an external relation between the trait and the environment, the gene's expression of the trait makes sense in the context of the environment's selection of the gene.

<sup>5</sup> That is, to specify what properties of an object are meaningful, one must specify properties of the agent: its sensory channels, such that some causally correlated sign of the object may get through to it; its instigatory channels, such that some accommodatory interpretant may get back to the object (however tangentially—including simple avoidance, so as to avoid a causal connection). See Gibson (1986).

<sup>6</sup> For there to be *motivation without meaning* would require that the selection of the instigated event made sense in the unmediated context of a feature of the sensed event. But even in the case of running away from a strong odor or loud sound, one is running from the source of the odor or sound, not from the odor or sound per se. Rather, one is not trying to get away from what one just sensed (*S*), but from that which will cause future sensations of a similar sort (*O*). Motivation without meaning is at best a limit case.

<sup>7</sup> The *O* might be likened to Peirce's 'immediate object' and the *A* might be likened to Peirce's 'dynamic object.' But the analogy is not perfect. See Peirce (4.536) and Colapietro (1989:15).

<sup>8</sup> In other words, the organism-environment overlap resolves itself into a relation between agents, sensed events and instigated events, on the one hand, and objects, signs and interpretants, on the other.

<sup>9</sup> Compare Dretske (1981) and Millikan (2004:31–46).

<sup>3</sup> The focus in this example is *accommodation*: *A-I* makes sense in the already existing context of *S-A*. But there is also *assimilation*: *A-I* makes sense in the subsequently existing context of *S-A*. For example, if *A* is an animal, *I* may be the chasing of some prey (qua means) and *S* the eating of that prey (qua ends). The first of these is often called a 'because-of' motive. And the second of these is often called an 'in-order-to' motive.

object of interest. Phrased another way,  $S$  is both an index and an icon of  $O$ . As an *index*, it is causally connected to  $O$  (no matter how long or short the chain of intermediaries). As an *icon*, it has properties in common with  $O$  (at the very least its time and place, with more or less leeway and displacement). For example, not only is the direction of the mother's face correlated with the existence of the object, but the child can use the temporal and spatial position of the mother's face to locate the temporal and spatial position of a potentially interesting object. The causal domain may be relatively large or small (spatio-temporally), and relatively complicated or simple (interactionally). For example, the correlation may be stronger when the mother knows her daughter is watching; and the correlation may disappear altogether when the mother is asleep. What ultimately matters is that the correlation be reliable enough for  $A$ 's selection (of  $I$  in the context of  $S$ ) to make sense. In other words, if the child looks where the mother is looking, she is likely to find an object of interest.

However,  $S$  could provide information about every single causal process it is caught up in; so that to define information only in terms of the  $O$ - $S$  relation is not helpful. For example, the position of the mother's face is also reliably correlated with the position of the mother's body (and the direction of gravity, and the time of day, and so on and so forth)—which may be of less interest to the child (or of interest for different reasons). As shown above, to specify the  $O$ - $S$  relation, one must specify the  $I$ - $O$  relation, and to specify the relation between these relations, one must specify the relation between the  $S$ - $A$  relation and the  $A$ - $I$  relation. That is, the properties of objects only make sense relative to the interests of agents. In this case, this may turn on the child's current beliefs and desires: say, to find something interesting to look at, versus to hold her mother's hand. Moreover, given the fact that most selection is ultimately grounded in natural selection, we may also say that agents only make sense in the context of objects. For example, to specify what is cognitively interesting about the child, one in part specifies what counts as salient signs, objects, and interpretants for the child—what counts as useful information, given the child's interests and abilities, and the natural and cultural properties of the world around it. In short, there are no isolated environments and organisms, there are only *envorganisms*.<sup>10</sup>

*Communication between conspecifics* is readily described. The case of vervet monkeys is perhaps the most famous example (Cheney & Seyfarth, 1990). Loosely speaking, these monkeys have different alarm calls, which they use to warn other monkeys: one call for snakes, one call for large terrestrial predators, and one call for areal predators. Depending on the alarm call given, itself reliably correlated with a type of predator, such monkeys instigate different types of behaviors: snake calls cause

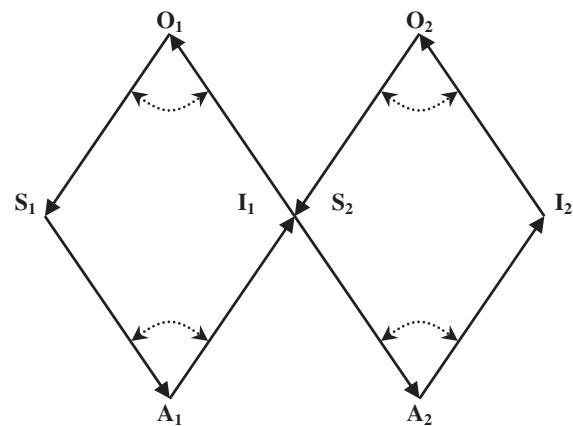


Fig. 2. Communication between conspecifics.

them to stand up on their hind legs and look around; eagle calls cause them to run down from trees into the underbrush; and cat calls cause them to run up into trees. Here, then, vervet monkeys are the conspecifics (who constitute the prey); a type of predator is the object; the type of call is the sign; and the type of caused behavior is the interpretant.

Fig. 2 diagrams this relation more carefully. Suppose  $A_1$  and  $A_2$  are genetically related agents (such as alarm-calling monkeys or ground-thumping bunnies). Suppose  $O_1$  is a predator,  $S_1$  is the sight of that predator, and  $I_1$  is a danger call. And suppose  $S_2$  ( $=I_1$ ) is the sound of that call,  $I_2$  is fleeing from the context of that call, and  $O_2$  is just  $O_1$  as stood for by a different sign. Indeed, just as  $O_1$  and  $O_2$  are essentially instances of the same object as stood for by different signs (the latter indexically 'inherits' its meaning from the former),  $A_1$  and  $A_2$  are really instances of the same agent as instantiated in different individuals.<sup>11</sup> With communication of this kind, an individual not only gets eyes in the back of its head, it also gets legs detached from its body. The sensing and instigating agent is extended—temporally, spatially, and genetically distributed.

We may examine the animal danger call from several perspectives. First, what is crucial about this example is that both interpretation and signification were selected for. That is, not only was  $A_1$ 's interpretation of  $S_1$  (as well as  $A_2$ 's interpretation of  $S_2$ ) selected for, but also  $A_1$ 's expression of  $S_2$ . Here then we have made the critical move from natural meaning to *non-natural meaning*,<sup>12</sup> from 'natural information' to 'intentional information' (cf. Grice, 1989a). While the predator's giving off signs of itself to the prey was not selected for, one prey's giving out signs of the predator to

<sup>10</sup> This is, of course, an axiom of certain traditions in biology (developmental systems), continental philosophy (Heidegger), and psychology (Gibson). Here, however, it is not so much an axiom, as an outcome of more basic axioms regarding meaning and motivation.

<sup>11</sup> That is, from the standpoint of the genes shared by two related prey, and given the properties of predators in relation to the traits expressed by those genes,  $A_1$ 's doing  $I_1$  in the context of  $S_1$  makes sense in the context of  $A_2$ 's doing  $I_2$  in the context of  $S_2$  (and vice-versa).

<sup>12</sup> Grice's distinction between natural and non-natural meaning presumed communicative intentions. The distinction offered here is much wider: the selection process can occur on any scale, from rational choice to natural selection.

another prey was selected for. This is what it means to say that the  $O_1-S_1$  relation constitutes natural information, and the  $O_2-S_2$  relation constitutes non-natural information. As another example, compare two types of joint-attention: in the case of simple gaze-following, a child merely looks where her parent is looking; in the case of ostension, a parent points in order to get a child to look. In the first case, the parent's direction of gaze is a natural sign (the parent just happens to be looking somewhere); whereas in the second case, the parent's gesture that directs attention is a non-natural sign (the parent intentionally points). Human speech acts—such as assertions, commands, and questions—are the exemplar of non-natural signs, so far as they are addressed, or intentionally expressed for the sake of others' interpretants of them.<sup>13</sup>

Second, the danger call has *roots* and *fruits*: it is simultaneously the interpretant ( $I_1$ ) of a sign ( $S_1$ ), and a sign ( $S_2$ ) with an interpretant ( $I_2$ ). In this way, it is both retentive and protentive, oriented to both the past and the future. Moreover so far as it was selected for, it may fail in either of these functions: any one of the sign—object—interpretant relations may go awry. Just as a sign may stand for the wrong object, a sign may also give rise to the wrong interpretant. In this way, the *tokens* instantiated may fail to conform to the *types* selected. One might compare human speech acts, in the tradition of John Austin (2003), whose immediate roots and fruits may be mental states and social statuses; and which, by failing to have the right roots and fruits on a given occasion, may be inappropriate in context and ineffective on context.

And third, the *mapping* between the object ( $O_2$ ) and the sign ( $S_2$ ), and the *re-mapping* between the sign ( $S_2$ ) and the interpretant ( $I_2$ ), is relatively simple. The mapping in question has one kind of content (there is a single type of object to be stood for by a single type of sign: SNAKE<sub>here-now</sub> ⇒ SCREAM<sub>here-now</sub>). However, one could imagine a more elaborate mapping, depending on whether the object was a terrestrial, arboreal, or airborne predator. And the re-mapping in question has one kind of mode (there is a single type of interpretant to be created by a single type of sign: SCREAM<sub>here-now</sub> ⇒ SCRAM<sub>here-now</sub>). However, one could imagine a more elaborate re-mapping, depending on whether the interpretant should be freezing, fleeing, or fighting. One might compare the complexity of human speech acts, whose content consists of a proposition, and whose mode consists of an illocutionary force.

In short, human speech acts are easily compared to animal signal systems. One assimilating and accommodating agent relates to another assimilating and accommodating agent, where each of the agent's interests are caught up with the other's. Such interactions are shot through with selectional processes: from evolutionary selection of cognitive capacities, through historical selection of linguistic constituents, to individual selection of

actual utterances (which incorporate such constituents and actualize such capacities). Indeed, even those emblems of human cognition, *symbols* (i.e. conventional relations between signs and objects, which seem to be minimally motivated and maximally arbitrary), are subject to selection. Language is just a particularly complex mode of motivation and meaning.

### 3. Mental states (and speech acts)

Meaning and motivation are the essence of both language and mind. On the one hand, intentionality is understood in terms of *representation*: just as signs stand for objects, mental states and speech acts represent states of affairs. For example, one may believe or assert that it is raining; one may intend or promise to go shopping. On the other hand, intentionality is understood in terms of *satisfaction*: just as a means may fail to serve the end for which it was selected, the conditions represented by a mental state or speech act may fail to be satisfied. For example, beliefs and assertions can be false; intentions and promises can be frustrated.<sup>14</sup> Of course, language and mind are just two possible modes of meaning and motivation: *selecting agents and significant objects exist wherever there is life, whatever its level*. Nonetheless, given the importance of language and mind to human concerns, it is worth reframing them in terms of the foregoing categories.<sup>15</sup>

There are many sources of creativity in the co-constitution of organism and environment, many modes of agency arising from the interplay of meaning and motivation. The rest of this section explicates a few stereotypic properties of mental states: causality, rationality, coherence, incorporation, contextualization, enchainment, embedding, intensionality, flexibility, and displacement. All of these properties allow human specific modes of cognition to be *generative* in von Humboldt's classic sense: an infinite number of ends are possible with a finite number of means (cf. Hockett 1958, Jackendoff 2002, *inter alia*). While such properties are therefore the hallmark of complex cognitive processes, they will be analyzed in the relatively simple idiom of meaning and motivation.

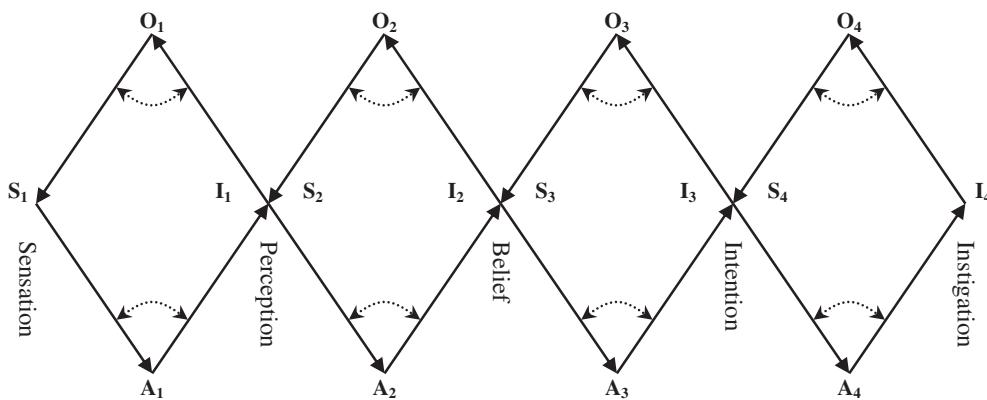
Cognitive processes have three components. A *sign* is whatever represents. An *object* is whatever is represented by a sign. And an *interpretant* is whatever a sign gives rise to insofar as it represents an object.<sup>16</sup> Recall Fig. 1. Canonical signs are mental states and speech acts, which are also known as private and public representations, respectively. Canonical objects are states of affairs, such as a thing, action, or event in the world. And canonical interpretants are themselves signs, such as other mental states and

<sup>14</sup> Brentano (1995 [1874]) and Chisholm (1967).

<sup>15</sup> Moreover, the usual accounts of mind privilege representation (or sign—object relations) over inference (or sign—interpretant relations); and the usual accounts of language privilege symbolic sign—object relations over iconic and indexical ones. Finally, foregoing a relations-between-relations frame, they fail to see the continuities: language and mind are no more mysterious than any other motivated and meaningful process.

<sup>16</sup> See Kockelman (2005, 2007) and Peirce (1955:99).

<sup>13</sup> The signs themselves, out of which the speech act is composed, are all non-natural—but on different timescales, and as selected by different agents.



**Fig. 3.** Indexical and inferential enchainment of cognitive processes.

speech acts.<sup>17</sup> For example, a speech act may represent a state of affairs and gives rise to a mental state. And a mental state may represent a state of affairs and gives rise to a speech act. Cognitive processes may partake equally of language, mind, and world.

For the moment, we may focus on a few stereotypical properties of *mental states*.<sup>18</sup> As diagrammed in Figure 3, a sensation ( $S_1$ ) is caused by a state of affairs ( $O_1$ ) and indexically gives rises to a perception ( $I_1$ ). A perception ( $S_2$ ) represents a state of affairs ( $O_2$ ) and inferentially gives rise to a belief ( $I_2$ ). A belief ( $S_3$ ) represents a state of affairs ( $O_3$ ) and inferentially gives rise to an intention ( $I_3$ ). And an intention ( $S_4$ ) represents a state of affairs ( $O_4$ ) and indexically gives rise to an instigation ( $I_4$ ), which may itself either immediately constitute, or eventually cause, the state of affairs so represented. In short, some sign–interpretant remappings are maximally inferential (i.e. relatively logical processes linking perceptions to beliefs, beliefs to intentions); others are maximally indexical (i.e. relatively causal processes linking states of affairs to perceptions, intentions to states of affairs)<sup>19</sup>. These properties are summarized in Table 1. The components of cognitive processes are as likely to be premises and conclusions as causes and effects.<sup>20</sup>

Though not shown in Fig. 3, a belief ( $S_3$ ) may also give rise to any number of other beliefs before giving rise to an intention ( $S_4$ ). That is, the ‘innards’ of such a process could

be indefinitely extended. Moreover, the instigation ( $I_4$ ), or whatever state of affairs it ultimately brings into being, may itself constitute an object that causes a sensation, and so such processes could continue indefinitely. That is, the ‘output’ of one such process could become the ‘input’ of another such process, ad infinitum. Cognitive processes are the roots and fruits of other cognitive processes.

The agent ( $A$ ), shown at different stages in the process ( $A_1, A_2, A_3, A_4$ ), is not a homunculus. Rather, it might be thought of as a set of ‘devices’ which have been selected to process representations in a manner that is causally and logically coherent (from the standpoint of that agent).<sup>21</sup> Such selection may involve neurological processes selected for on evolutionary timescales, as much as cultural processes selected for on historical timescales, as much as personal processes selected for on biographical timescales. Moreover, given the potential enchainment of outputs to inputs, maximally intensified with the introduction of speech acts, the agencies involved are as likely to be intersubjective and intrasubjective.

To invoke coherence presumes the possibility of *incoherence*: such causal and logical processes may go awry. This is what was referred to above as ‘failure to be satisfied’. Just as an intention may be frustrated (by not causing the state of affairs it represents), a perception may be non-veridical (by not being caused by the state of affairs it represents). In addition to such indexical incoherence, there is also inferential incoherence: the reasoning that links perceptions to beliefs (empirical), beliefs to beliefs (theoretical), and beliefs to intentions (practical) may involve both false premises and fallacious arguments.

It is worthwhile sketching a few elementary features of inferential processes. Suppose that, in the mind, there are concepts delimiting individuals (*John, Fido*), classes (*dog, plumber*), and properties (*strong, furry*). And suppose that just as individuals may belong to different classes (*Fido is a dog*), members of different classes may have different properties (*dogs are furry*). Here, then, we have the

<sup>17</sup> Though, stereotypically, signs are speech acts, objects are states of affairs, and interpretants are mental states.

<sup>18</sup> It is loosely comparable with what some cognitive scientists have called the western folk-theory of mind (D'Andrade, 1996). It might therefore be understood as an account of our own intuitions—to be treated as a warning as much as a guide. At the very least, cognitive science would have to account for such interpretations: why a cognitive agent's reflexive understanding of its own cognitive processes is structured as such.

<sup>19</sup> There are many other kinds of mental states and speech acts that are not being discussed here.

<sup>20</sup> The causal and rational, or indexical and inferential, nature of mental states has been fruitfully analyzed by Anscombe (1959); Brandom (1994); Davidson (1984); Grice (1989c); and Searle (1983). The distinction between indexical and inferential processes is not disjunctive. All inferential processes presuppose indexical processes. Rather, the emphasis is on maximally indexical (minimally inferential) and maximally inferential (minimally indexical) processes.

<sup>21</sup> Each of the cognitive processes was selected to interface with the others: just as we stepped back from the agents involved in the danger calls to a single agent, in the case of successively entertained mental states, each instant of the entertainer is an instant of the same agent.

**Table 1**  
Inference and indexicality.

	Effect	Perception	Belief	Intention	
inference	X				
Premise	X	X			
Conclusion		X	X		
Cause				X	

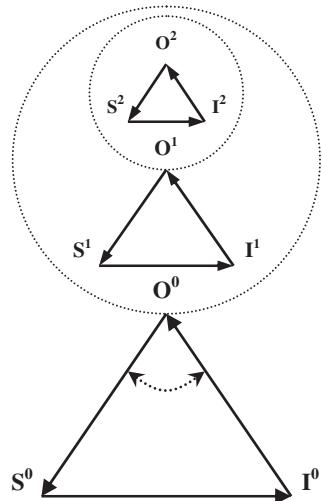
Env  
↓ Org  
↓ Env  
assimilation accommodation

**Table 2**  
Varieties of inference.

<b>Deduction</b> If something belongs to class C, then it has property P; The individual I belongs to class C; Thus, I has property P.
<b>Induction</b> The individual I belongs to class C; I has property P; Thus, if something belongs to class C, then it has property P.
<b>Abduction as affirming the consequent (early Peirce)</b> The individual I has property P; If something belongs to class C, then it has property P; Thus, I belongs to class C.
<b>Abduction as inference to best explanation (late Peirce)</b> Some surprising fact (F) is observed; If some hypothesis (H) were true, F would readily follow; Thus, there is reason to believe that H is true.

stereotype of a propositional content: the relation between a theme (whatever is being represented: *Fido*; dogs) and a character (however what is being represented is being represented: *is a dog*; *are furry*). Such a theme–character relation may be used as a reason (for another such relation), or may be in need of a reason (by another such relation).<sup>22</sup>

Three forms of reasoning are exemplary of inference: deduction, induction, and abduction. As shown in Table 2, deduction goes like this: dogs are furry and Fido is a dog, so Fido must be furry. Induction goes like this: Fido is a dog and Fido is furry, so dogs must be furry. And abduction is sometimes thought to go like this: Fido is furry; dogs are furry; so Fido must be a dog. However, rather than being merely an instance of affirming the consequent, abduction is actually a generator of hypotheses. Or, to write out this inference in less abstract terms: a surprising fact comes to light (Fido is furry); if some other fact were true (say, Fido were a dog), this first fact wouldn't be so surprising (because we already know that dogs are furry); thus, we may adduce that Fido is a dog (a hypothesis that could guide further investigation, and one worth entertaining even if eventually rejected). If induction is about



**Fig. 4.** Embedding.

generalization (one uses features of a token, or instance, to infer features of a type, or class), abduction is about creation (inventing an hypothesis to explain an observed fact). Peirce's own example is quite colorful:

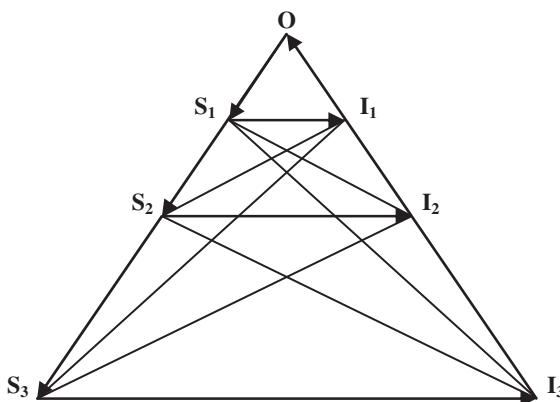
I once landed at a seaport in a Turkish province; and, as I was walking up to the house which I was to visit, I met a man upon horseback, surrounded by four horsemen holding a canopy over his head. As the governor of the province was the only personage I could think of who would be so greatly honored, I inferred that this was he. This was an hypothesis [or abduction] (3.226).<sup>23</sup>

As may be seen from these examples, inferential processes involve *incorporation*. In particular, propositions are composed of concepts (turning on individuals, classes, and properties); and arguments are composed of propositions (such as premises and conclusions, as well as antecedents and consequents). To understand the inferential articulation of representations, then, one needs an account of both the conceptual structure of propositions and the propositional structure of arguments. For the moment, such structures are being treated in relatively simple terms; when speech acts are introduced, the lexical and grammatical structure of propositional contents, as well as the discursive structure of arguments, will be further clarified. The components of cognitive processes may be both incorporated parts and incorporating wholes.

Moreover, inferential processes involve *contextualization*. For example, to move from one relatively foregrounded belief (qua premise) to another relatively foregrounded belief (qua conclusion) requires a network of relatively backgrounded beliefs (qua auxiliary premises). That is, one cannot get from p to q without a belief like if p then q. More concretely, one cannot get from a belief that it

<sup>22</sup> Compare Peirce on rhematic, dicent, and argument signs (1955: 103–104), Kockelman on theme, character, and reason (2007), and Chafe (1994) and Lambrecht (1994), *inter alia*, on topic-focus structure.

<sup>23</sup> That is: so and so is celebrated; if so and so were governor, their celebration would not be surprising; thus, so and so must be governor. See Deutscher (2002) for a nice discussion.



**Fig. 5.** Flexibility and displacement.

is raining to an intention to open one's umbrella without a belief that opening one's umbrella would keep one dry (as well as a desire to stay dry). That is, the same belief may require other beliefs (perceptions and intentions), or be required by other beliefs (perceptions and intentions), to make an inference. To understand the inferential articulation of representations, then, one also needs an account of search strategies within a network of beliefs, intentions, and perceptions—how to efficiently find and process the most relevant information given the current context. The components of cognitive processes may be both contextualized figures and contextualizing grounds.

So far we have examined the *enchainment* of cognitive processes: a sign gives rise to an interpretant which is itself a sign. With human agents, cognitive processes also *embed*: a sign stands for an object which is itself a sign. This is diagrammed in Figure 4. For example, a mental state may represent another mental state: I may have beliefs about another's beliefs, perceptions, or intentions. In other words, whatever is represented may itself be a representation, or include one or more representations within it. Indeed, not only may I represent what and how you believe (qua object and sign), I may also represent what your belief will give rise to (qua interpretant of it as a sign), as well as what gave rise to your belief (qua sign of which it is an interpretant). Cognitive processes may reflexively make reference to themselves.

With embedding, the propositional contents of inferential processes incorporate relatively complex concepts such as *belief*, *perception*, and *intention*. For example, in addition to having representations such as *Fido is a dog* and *dogs are furry*, one has representations like *John believes that Fido is a dog*, and even *belief is a weak form of knowledge*. That is, just as mental states may be predicated of people, properties may be predicated of mental states. And just as representations are caught up in reasoning, so too are representations of representations: one may make deductions, inductions, and abductions about the mental states of others. Jake took his umbrella; if Jake believes it will rain, taking his umbrella would be a matter of course; so Jake must believe that it will rain. That is, we may reason about both our own and others' representations.

Just as the enchainment of cognitive processes is often called 'thinking,' the embedding of cognitive processes is

**Table 3**  
Types of framing.

Component as sign versus interpretant	Future	Past
Component as sign versus object	Low-order	High-order
Diagram iterated versus stretched	Distal	Proximal
Component incorporated versus incorporating	Part	Whole
Component contextualized versus contextualizing	Figure	Ground
Cognitive process is private versus public	Actor	Observer

often called 'thinking about thinking' (and, in the case of speech acts, 'speaking about speaking'). A phenomenon known as *intensionality* (notice the spelling) may arise because of this (cf. Frege, 1980 [1884]). In particular, one can represent the incoherence of another's representation (relative to one's own standard of coherence). For example, not only may I believe that the man over there is a spy, I may also believe that John believes that the man over there is a waiter. Indeed, I may represent why John believes this (given his past perceptions and beliefs); and I may represent what John will say and do (given his future beliefs and intentions). That is, I may represent where exactly his representations went awry, as well as the ramifications of this. Tests turning on intensionality are the classic locus for theory of mind—for example, the ability to pass a false-belief task (cf. Wimmer & Perner, 1983).

Two other kinds of leeway are enabled by cognitive processes. First, there may be multiple mappings between a representation and whatever it represents; and there may be multiple re-mappings between a representation and whatever it gives rise to. This is diagrammed in Figure 5. If understood as a space of possible mappings and re-mappings. That is, there are many possible signs (S<sub>1</sub>, S<sub>2</sub>, S<sub>3</sub>) of the same object (O), and many possible interpretants (I<sub>1</sub>, I<sub>2</sub>, I<sub>3</sub>) of the same sign (S). In part, this is due to different indexical and inferential enchaining; in part, this is due to different conceptual contents. For example, the same state of affairs may be represented by many different beliefs (though we both saw the same event, we remember it in different ways); and the same belief may give rise to many different intentions (though we both believe it's going to rain, we undertake different preparations). Cognitive processes are *flexible*.

And second, there may be more or less spatial and temporal distance between a representation and whatever it represents; and there may be more or less spatial and temporal distance between a representation and whatever it gives rise to. This is also diagrammed in Figure 5, if understood as a manifold of space and time. That is, a sign may be spatio-temporally displaced from an object, and an interpretant may be spatio-temporally displaced from a sign. For example, the intention that a belief gives rise to may be more or less distal from the perception that gives rise to the belief; and the state of affairs that the intention gives rise to may be more or less distal from the state of affairs that gives rise to the perception. Cognitive processes are *displaceable*.

This section has explicated a few stereotypic properties of mental states: causality, rationality, coherence,

incorporation, contextualization, enchainment, embedding, intensionality, flexibility, and displacement. All of these properties allow human specific modes of cognition to be *generative* in von Humboldt's classic sense: an infinite number of ends are possible with a finite number of means (cf. Hockett, 1958; Jackendoff, 2002, *inter alia*). While such properties are therefore the hallmark of complex cognitive processes, they were analyzed in the relatively simple idiom of meaning and motivation. (Indeed, we have not yet made reference to that stereotype of generativity: linguistic embedding or combinatoriality.) There are many sources of creativity in the co-constitution of organism and environment.

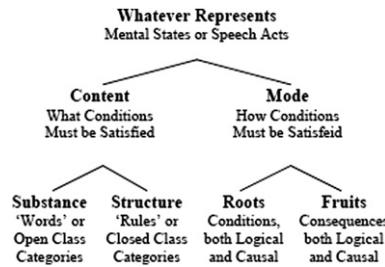
Implicit in the foregoing analysis is also the idea of *framing*: the same event may be understood as a component of different cognitive processes, depending on the interests of an actor and/or the stance of an observer.<sup>24</sup> Table 3. For example, in Fig. 2, what is a sign component of one cognitive process ( $S_2$ ) is the interpretant component of another cognitive process ( $I_1$ ). This is akin to a future-oriented versus past-oriented perspective. Or, as may be seen in Fig. 4, what is the object component of one cognitive process ( $O^1$ ) may be the sign component of another cognitive process ( $S^2$ ). This is akin to a lower-order versus higher-order perspective. Moreover, just as Fig. 1 can be successively iterated to produce Fig. 2 or Figs. 3 and 1 may also be stretched out to include Fig. 2 or Fig. 3. This is akin to taking a distal versus proximal perspective. Fig. 3 also focuses on propositional wholes which are contextualized figures, leaving out their conceptual parts and contextualizing grounds. There are other figure-ground and other part-whole perspectives to be taken, and thus it is usually an analytic decision as to what is incorporated and what is incorporating, or what is contextualized and what is contextualizing. And finally, one may switch from a private frame to a public frame—the usual arena where anthropologists (and ethologists) try to work given the kinds of data they have access to in the field. This is akin to taking an actor-centered versus observer-centered perspective. No perspective is primary: our diagrams of generativity are themselves generative; our analysis of meaning and motivation is itself meaningful and motivated.

#### 4. Speech acts (and mental states)

It should be emphasized that all the properties discussed in the last section are also emblematic of speech acts—that other form of intentionality, *qua* representation (meaning) and satisfaction (motivation). Indeed, so much of what we think about thinking arises by way of how we think about speaking or speak about thinking. *We are so often only minding language when we talk about mind.* While this section thereby focuses on speech acts, or cognitive processes whose sign components are public representations, it will necessarily tack back to mental states.

<sup>24</sup> Compare the idea of framing in cognitive semantics (Langacker, 1987; Talmy, 2000a, 2000b).

**Table 4**  
Representations.



Whatever represents has both a *content* and a *mode*. If the content specifies what conditions must be satisfied, the mode specifies how those conditions must be satisfied. The content is usually understood to be a proposition. In the case of speech acts, it is whatever can be asserted, questioned or commanded. And in the case of mental states, it is whatever can be perceived, believed or intended. What is crucial, however, is that there exist a systematic mapping between whatever represents and whatever is represented. The mode is usually understood to be a speech act or mental state shorn of its propositional content. In the case of speech acts, it is a kind of illocutionary force: declarative, interrogative, imperative. And in the case of mental states, it is a kind of psychological attitude: perception, belief, intention. What is crucial, however, is that there exist a systematic re-mapping between a representation and whatever it will give rise to (or whatever has given rise to it). In short, if the content foregrounds the O–S relation, the mode foregrounds the S–I relation. These relations are shown in Table 4.

The content turns on the interaction of *substance* and *structure*.<sup>25</sup> In the case of speech acts, substantive content is due to lexical categories: words like *boy* and *dog*, *chase* and *see*, *mean* and *little*. And structural content is due to grammatical categories: words like *I* and *some*, affixes like *-ed* and *-ing* and abstract construction types more generally: noun phrase, transitive verb, and dependent clause.<sup>26</sup> Sometimes this distinction is phrased in terms of lexicon and grammar (cf. Talmy, 1978, 2000a, 2000b).<sup>27</sup> For present purposes, what matters is that, with such substance and structure, a speaker may generate an infinite number of more or less complex sentences

<sup>25</sup> One might think of lexical categories as maximally symbolic, and grammatical categories as maximally indexical—either encoding relations like  $P^n$ – $P^n$  (case) or encoding relations like  $P^n$ – $P^S$  (person). Together, with the paradigmatic selections and syntagmatic combinations that constitute equivalency classes, they constitute iconic categories—in Wittgenstein's picture-theory sense.

<sup>26</sup> There is no hard and fast distinction between substantive and structural content, or open- and closed-class categories. They should not be thought of as positions in an opposition, but rather poles of a continuum.

<sup>27</sup> Suffice it to say, linguistic analysis reveals complex patterns which are outside the scope of this essay. For present purposes, note how complicated linguistic substance and structure can be compared to the above examples of concepts (individuals, classes, properties) and theme-character relations (propositions, arguments).

representing an infinite number of more or less complex states of affairs: *I saw a little dog being chased by some mean boys.* (Compare the scope of object–sign mappings possible with animal signal systems.) While this is the most famous kind of generativity (essentially an O–S mapping, turning on incorporation), each of the other kinds of generativity discussed above (both O–S mappings and S–I re-mappings, turning on contextualization as much as incorporation, and grounded in indexicality as much as inference) are just as important and yet often neglected.<sup>28</sup>

The mode turns on the interaction of roots and fruits.<sup>29</sup> As a public representation, a speech act follows from a private representation (an intention of the speaker), and leads to a private representation (a belief of the addressee).<sup>30</sup> That is, a speech act is at once the interpretant of a sign–object relation and a sign–object relation to be interpreted.<sup>31</sup> Moreover, the speaker's intention may itself have roots (such as other beliefs, perhaps following from past perceptions); and the addressee's belief may itself have fruits (such as further beliefs, perhaps leading to future intentions). Such re-mappings may be more or less

complex, often as a function of contextualization. (Compare the scope of sign–interpretant re-mappings possible with animal sign systems.) In this way, the conditions for, and consequences of, any speech act radiate out in two directions—generated by and generating of further representations, themselves more or less subject to substantive and structural transformations. Representations may both develop and devolve.

Both the content and the mode are subject to a distinction between *token* and *type*, or concrete instances and abstract categories. For example, whatever represents, qua sign (S), exists as both type (sentence) and token (utterance). And whatever is represented, qua object (O), exists as both type (proposition) and token (state of affairs). Thus, just as the same sentence ('it's raining') may be instantiated by many different utterances (each said on a different occasion), the same proposition may represent many different states of affairs (any situation that fits the occasion). Indeed, whatever a representation gives rise to, qua interpretant (I), or whatever gives rise to a representation, exists as both type and token. For example, to focus on the felicity conditions of a speech act is to focus on its typical roots and fruits,<sup>32</sup> whereas to focus on the communicative intention of the speaker (or 'speaker meaning') is to focus on the tokened roots. And to focus on the perlocutionary effect on the addressee (or 'addressee response') is to focus on the tokened fruits. In short, to speak of types is to foreground the general properties of sign–object–interpretant relations (why they were selected); and to speak of tokens is to foreground the specific properties of sign–object–interpretant relations (how they were instantiated).

To invoke types, and thereby presume *typicality*, opens the possibility of *atypicality*: tokens not conforming to types due to the strategy of actors or the contingency of events. In the case of mental states, this was already discussed under the heading of incoherence: perceptions can be non-veridical, beliefs can be false, intentions can be frustrated. But it is just as applicable to speech acts: a speaker may not believe what she asserts or intend what she promises; and an addressee may not believe what he is told or behave as he is commanded. In other words, the typical roots and fruits of a speech act need not conform with the tokened roots and fruits: the communicative intention (of the speaker) may be at odds with the felicity conditions (of the sentence); and both of these may be at odds with the perlocutionary effect (on the addressee).<sup>33</sup> Speech act theory, as inaugurated by Austin (1962), is in part the elucidation of types by attending to the ramifications of atypical tokens. One explains what something does, and/or why it was selected, by reference to the possibilities of its going awry—being inappropriate in context or ineffective on context.

<sup>28</sup> Presumably, the conceptual content of mental states has a similar substance and structure (recall the discussion of concepts and propositions, from Section 2). However, in the case of mental states, how the content (and mode) is neurally instantiated is an open question. Presumably, there is a nice relation between mental states and speech acts, regardless of which is originary and which is derivative. Indeed, many theorists assume there is a rich conceptual structure that is prior to language (both developmentally and evolutionarily), and which is later enriched by the introduction of linguistic categories. And there are long-standing arguments about the degree to which the content and structure of the world drives the content and structure of mental states, and/or drives the content and structure of speech acts. Nominalism gives words priority (qua lexical categories), idealism gives object-types priority (qua concepts), and realism gives object-tokens priority (qua material things). From the standpoint of meaning and motivation, however, it is very difficult to disentangle signs from objects, interpretants from signs, and selecting agents from significant objects.

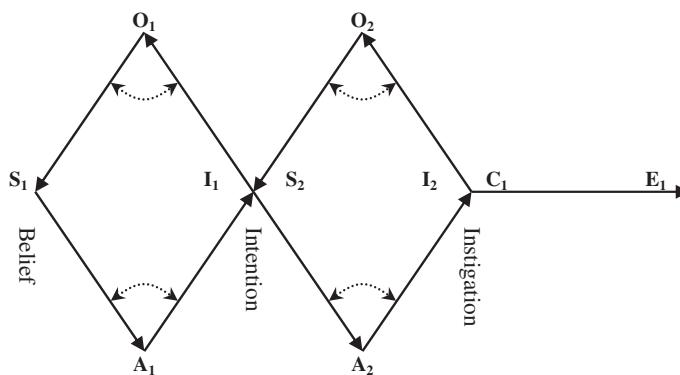
<sup>29</sup> As mentioned in Section 1, speech acts also have social statuses as their roots and fruits: certain kinds of utterances are only appropriate if participants currently hold certain social statuses, and are only effective if participants subsequently hold certain social statuses. Though less famous than mental states, social statuses are just as important to the workings of speech acts (Austin, 2003).

<sup>30</sup> When we foreground the 'function' of a speech act, we focus on its fruits. For example, just as the function of an assertion is to create a belief in the addressee (with corresponding propositional content), the function of an imperative is to create an intention in the addressee (with corresponding propositional content). And so another way to think about the mode, qua illocutionary force, is that it is telling the addressee how the mapping in question is (to be) brought about. The function of an assertion is to create a belief in the addressee which has a propositional content that corresponds to the propositional content of the assertion. The function of an imperative is to create an intention in the addressee which has a propositional content that corresponds to the propositional content of the imperative. The illocutionary force is specified by lexical categories (encoded by words like *declare* and *ask*), grammatical categories (encoded by syntactic inversion and intonation), and interactional coherence (implicated by actional sequences in ongoing context).

<sup>31</sup> In the case of mental states, we analyzed these as follows: perceptions have indexical roots and inferential fruits; beliefs have inferential roots and inferential fruits; and intentions have inferential roots and indexical fruits. That is, we analyzed the nature of the processes that lead to a representation and follow from a representation, turning on causality and rationality.

<sup>32</sup> When only focusing on the fruits, such types are often called 'proper function' or 'sentence meaning'.

<sup>33</sup> More generally, there are infelicities of form (S), infelicities of content (O), infelicities of function (I); and infelicities of form–content mapping (O–S), and infelicities of form–function re-mapping (S–I).

**Fig. 6.** Non-communicative action.

To invoke types requires an account of *regimentation*: tokens conforming to types via regularities, norms, rules, and laws.<sup>34</sup> As is well known, regularities are merely statistically significant patterns. Such patterns were not selected for, and so do not exist for a reason. Because it makes no sense to speak of the violation of a regularity, phenomena like atypicality, failure, and lack-of-satisfaction cannot arise. Norms turn on dispositionalism: one behaves a certain way because one is disposed to behave that way; and one is so disposed because of imitation (of others) and sanctioning (by others). Rules, in contrast to norms, are explicit: being represented by mental states or speech acts. Classic example are moral injunctions, such as the Ten Commandments and the Golden Rule. Laws, in contrast to rules, are political: being promulgated and enforced by a state. Laws make reference to the threat of violence within the scope of polity. Such sociohistorical forms of regimentation bear a double-edged relation to creativity: while they may be otherwise (there, then, and among them), they must be this way (here, now, and among us). To have second natures is human nature.

Natural selection is itself the ur-form of regimentation: almost all other modes of motivation and meaning spring from it. For example, the dispositionalism of the human species, which underlies norms, was probably selected for on evolutionary timescales, and gives rise to cultural regimentation on historical timescales: types of behaviors that one may or must (not) do in types of circumstances. And the capacity to represent and communicate norms, thereby creating rules and eventually laws, is itself grounded in our

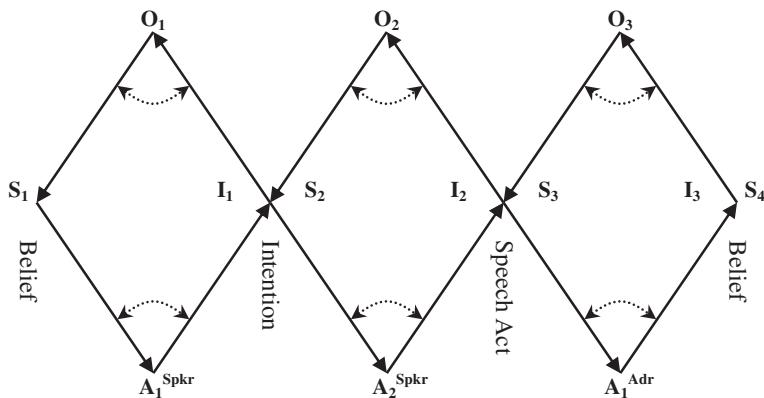
species-specific facility with mental states and speech acts. Moreover, even personal motivations, underlying practical reasoning and rational choice, make reference to the norms, rules, and laws of one's community (and its beliefs and values); and the inferential and indexical coherence underlying all such forms of reasoning resides in neurocognitive processes that are certainly adaptations.<sup>35</sup> In short, cognitive processes are regimented on phylogenetic, historical, and ontogenetic timescales; and they therefore make reference to properties that are unique to species, cultures, and individuals. Such forms of regimentation are akin to meter in poetry: they are simultaneously the source and shackle of human creativity.

Speech acts are actions: instigations caused by intentions. One must therefore understand how they are similar to, and different from, *non-communicative actions*: opening an door, making a U-turn, scratching one's chin, and so on. These are diagrammed in Figure 6. In particular, an intention ( $S_2$ ) represents a state of affairs ( $O_2$ ). For example, one intends to start the engine. It indexically gives rise to an instigation ( $I_2$ ) that either immediately constitutes ( $C_1$ ), or eventually causes ( $E_1$ ), the state of affairs represented. For example, whereas the agent's instigation ends at turning the key ( $I_2$ ), this is itself the cause ( $C_1$ ) of a further effect ( $E_1$ ), such as the engine's actually starting (which is mediated by considerations outside of the agent's immediate control: wiring, batteries, etc.).<sup>36</sup> And the intention ( $S_2$ ) is itself the conclusion ( $I_1$ ) of an inference involving a contextualized belief ( $S_1$ ) and a contextualizing pro-attitude (such as a desire, obligation, or value). For example, one believes that starting the engine is a means to drive to the cinema as an end, and one wants to drive to the

<sup>34</sup> See Brandom (1979); Haugeland (1998); Lewis (1969); Millikan (2005); Weber (1978:54). Millikan (2005) has redefined *convention*, going against the grain of the famous definition by Lewis (1969). In particular, for a speech act to be conventional requires that it have several properties. First, its actual form is an instance of a more general form: that is, it is a replica, or token of a pre-existing type. Second, it is proliferated by the weight of precedence: that is, it exists as a token by virtue of the fact that previous tokens of the same type existed. And third, there is an arbitrary relation between form and function—between the object component and the sign component, or between the sign component and the interpretant component. Together, these three properties are iconic, indexical and symbolic, respectively. Finally, in the case of the proper function of speech acts, the form solves a coordination problem between two or more types of actors—and thus benefits both speaker and addressee, both signer and interpreter.

<sup>35</sup> Of course, while these other forms of regimentation are ultimately products of natural selection, they often yield more immediate results that may circumvent it—say, cultural norms or national laws which foster birth-control.

<sup>36</sup> In the case of more mediated actions (for example, not just intending to turn a knob but also, by means of that, to open a door), the intention represents this additional cause-effect pairing. The well-known 'accordion effect' (Searle, 1983) is a reflection of the infinite means-ends chaining, qua cause-effect pairings, that most practices may be divided up into. This is another type of framing. And, as Anscombe's claim (1959) goes, if an instigation is an intention under one description (I was opening the door) it is an intention under all descriptions (I was entering the house; I was trying not to wake my husband; etc.).



**Fig. 7.** Conventional communicative action.

cinema (because one wants to see a movie, and so on).<sup>37</sup> This is what it means to say an intention has inferential roots (practical reasoning) and indexical fruits (causal chaining).<sup>38</sup>

All this may be couched in slightly different terms. We said that whatever represents (such as an intention) has both a content and a mode: the content specifies what conditions must be satisfied; and the mode specifies how those conditions must be satisfied. In particular, we may say that an intention represents its satisfaction conditions: a certain state of affairs is to be brought about (content); this state of affairs is to be caused by the intention (fruits); and this intention is to be justified by a reason (roots).<sup>39</sup> To specify the satisfaction conditions of an intention is therefore to specify how it may go awry, or fail to be satisfied. Crucially, none of these steps need be consciously represented. And our evidence for their existence comes from attending to unsatisfied outcomes: the times one turned the key (but the battery was dead); the times one started the car (but couldn't remember where one wanted to go, or why one wanted to go there); the times one fingers slipped (in turning the key); the times one turned the key and started the car (but unintentionally so); and so on. At the very least, all are but potential moves in explicitly articulated and temporally retrospective rationalizations.

As diagrammed in [Figure 7](#), conventional communicative action is more complicated. Suppose, for example, one intends to say that Jake got arrested. Here the instigation ( $I_2$ ) is itself a public representation: a speaker ( $A^{Spkr}$ ) utters a sentence with propositional content (Jake's getting arrested) and illocutionary force (declarative). That is, unlike the case of non-communicative action, where the instigation either constitutes or causes the state of affairs in question, here the instigation is itself a sign ( $S_3$ ), to be interpreted by an addressee ( $A^{Adr}$ ), and thereby give rise to a belief ( $I_3$ ). As a public representation, the speech act itself has satisfaction conditions (it should arise from a communicative intention and give rise to a belief). And to say that a communicative action is conventional is to say that the satisfaction conditions of the speech act (qua 'sentence meaning') are in accordance with the satisfaction conditions of the intention (qua 'speaker meaning'): the speaker is using the sentence as it would usually be used (cf. [Austin, 2003 \[1955\]](#)). Finally, as before, the intention ( $S_2$ ) is itself the conclusion ( $I_1$ ) of an inference involving a contextualized belief ( $S_1$ ) and a contextualizing pro-attitude (such as a desire, obligation, or value). For example, one believes that informing the addressee of Jake's fate is a means for eliciting sympathy, and one wants to elicit sympathy (because one wants to obtain money, and so on). Thus, communicative actions also have inferential roots (practical reasoning) and indexical fruits (causal chaining)—but their indexical fruits are designed to yield further fruits, which are both intersubjective and inferential.<sup>40</sup>

As shown in [Figure 8](#), non-conventional communicative action is even more complicated. It involves several key ideas. First, the signer ( $A^{Sgn}$ ) instigates some behavior ( $I_2$ ), which is itself a first-order sign ( $S_3^{1^\circ}$ ), that brings a state of affairs ( $O_3^{1^\circ}$ ) to the attention ( $I_3^{1^\circ}$ ) of the interpreter ( $A^{Int}$ ). For example, in being asked what happened to Jake, one may point to a passing police car. Second, this state of affairs ( $O_3^{1^\circ}$ ) is itself a second-order sign ( $S_3^{2^\circ}$ ) that brings another state of affairs ( $O_3^{2^\circ}$ ) to the interpreter's attention

<sup>37</sup> In other words, insofar as an intention is not just causal of a state of affairs, but also in need of a reason, its satisfaction conditions may include the belief (and perhaps pro-attitude) which justifies it. In other words, an intention may be the conclusion of a practical inference: 1) if I open the door, then I can enter the room; 2) I want to enter the room; 3) so I shall open the door. Such an inference has premises: a relatively foregrounded conditional (a belief involving an if-then sequence); a relatively backgrounded pro-attitude (qua desire, status, or value). And such an inference has a conclusion: the intention itself (I shall open the door). If asked to provide a reason for one's behavior, one may articulate such a sequence: both a belief (if-then) and a pro-attitude (a desire, status, a value).

<sup>38</sup> See [Anscombe \(1959\)](#); [Brandom \(1994\)](#); [Davidson \(1984\)](#); and [Searle \(1983\)](#).

<sup>39</sup> From the standpoint of content, an intention represents the state of affairs that would result from the fulfillment of that intention (for example, that I opened the door). In this way, the content of an intention is nearly identical to the content of the belief (or assertion) that would truthfully describe the action instigated by the intention.

<sup>40</sup> [Fig. 7](#) has removed some causal interactions from the frame. For example, the instigation (in the throat) causing sound waves, and such sound waves causing a sensation (on the eardrum).

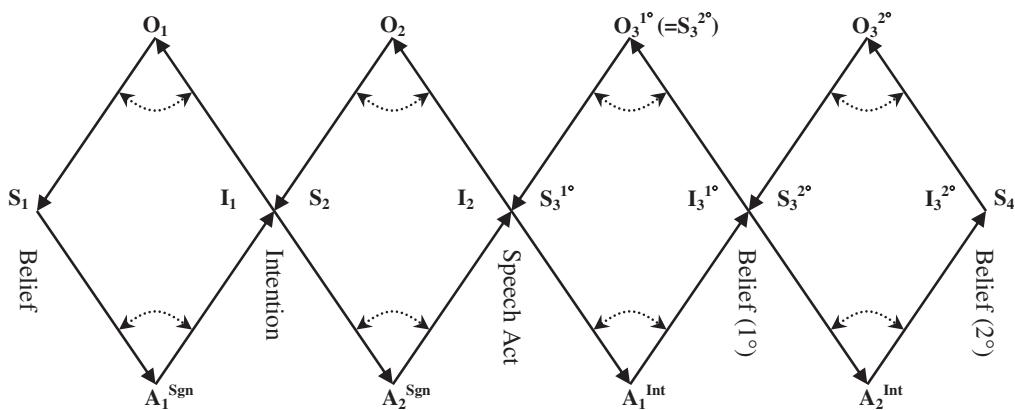


Fig. 8. Non-conventional communicative action.

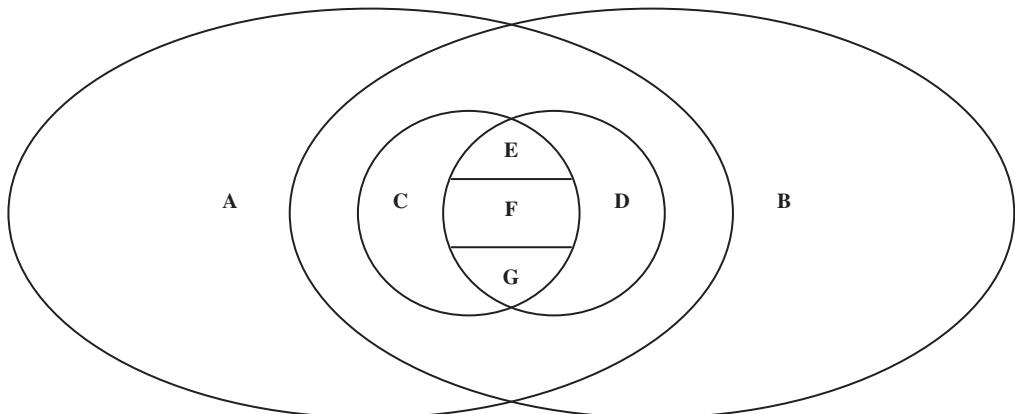


Fig. 9. Relative intersubjective overlap of intentional horizons.

( $I_3^{2\circ}$ ). For example, by attending to the police car that has been pointed to, the addressee may infer that Jake was arrested. And third, the inferential process from the first belief ( $I_3^{1\circ}$ ) to the second belief ( $I_3^{2\circ}$ ) turns on the interpreter's recognition of the signer's informative intention ( $S_2$ ). In short, the satisfaction conditions of such an intention are quite complex. They involve not just the sign event that the intention gives rise to (pointing), not just the belief that this sign event gives rise to (there's a police car), and not just the belief that this belief gives rise to by reference to the intention (Jake was arrested), but also the fact that these representations give rise to each other in this way (cf. Grice, 1989a, 1989b; Strawson, 1971).<sup>41</sup>

Note the implicit embedding: the signer expresses a sign whose relatively concrete object (the police car) is itself a sign of a more abstract object (Jake's arrest)—and the interpreter can only infer the second object by attending to the fact that the first sign was intentionally

expressed. Unlike conventional speech acts, there are no codes to decode (in getting from a police car to Jake's arrest), and hence interpretation is non-deductive. In other words, the first inferential step ( $S_3^{1\circ} - I_3^{1\circ}$ ) is often relatively concrete and immediate: the interpreter looks where the signer points, or decodes what the signer says. In this example, there is an instance of (ostensive) joint attention: the signer points to a police car. Whereas the second inferential step ( $S_3^{2\circ} - I_3^{2\circ}$ ) is relatively abstract and ampliative: the interpreter infers, often abductively, some further information from what was pointed out or spoken about, as contextualized by their recognition of the signer's communicative intention. In this example, there is an instance of abduction: some surprising fact has come to light (the signer has pointed to a police car rather than answered my question); if the signer intended to inform me that Jake was arrested, pointing to a police car would be a matter of course (a relatively efficient, and covert way, to get the information across); thus, I may infer that Jake was arrested (which is subject to confirmation or rejection in the ensuing conversation).

Such an ability to amplify the meaning of information by contextualizing it with an informative intention is the heart of Gricean implicature (Levinson, 1983, 2000). However, such a process is much broader than Gricean implicature:

<sup>41</sup> Fig. 8 has removed several causal connections from the frame. Here the sign that the intention gives rise to need not be an assertion: it may be a behavior that directs the addressee's attention to a state of affairs (pointing), or a behavior that brings a state of affairs to the addressee's attention (showing).

any non-natural sign—be it naturally selected, culturally regimented, or rationally chosen (or ‘addressed’)—is easier to interpret if one knows something about why it was selected. Indeed, it is often impossible to interpret otherwise. For example, biologists may infer the function of an organ by reference to adaptive explanations of its having been selected. That is, an organ may serve lots of functions (given its form); but to figure out which of these functions it was supposed to serve, one must offer an adaptive account of its selection. Indeed, psychoanalysis, was fundamentally committed to a kind of implicature: by attending to the overt or first-order meaning of a dream (parapraxis or neurosis), in the context of its having been selected to express a forbidden wish of a sexual nature (as theorized by Freud), analysts may infer its covert or second-order meaning.<sup>42</sup>

Humans have intentionality: they interact with the world using representations of the world (I believe that...). Humans understand intentionality: they interact with the world using representations of others' representations of the world (I believe that you believe that...). And humans share intentionality: they interact with the world using overlapping representations of each other's overlap in representations (we believe that we believe that...). Crucially, language enlists intersubjective intentionality as a means and offers intersubjective intentionality as an end.<sup>43</sup>

This idea is worth diagramming, as shown in Figure 9. Let ellipse A represent all the beliefs that the speaker could entertain as true (including beliefs about the representations of others). Let ellipse B represent all the beliefs that the addressee could entertain as true (including beliefs about the representations of others). The intersection of A and B represents all the beliefs that both the speaker and the addressee could entertain as true. The ellipse C represents all the beliefs the speaker could entertain as true about which beliefs both the speaker and the addressee could entertain as true. The ellipse D represents all the beliefs the addressee could entertain as true about which beliefs both the speaker and the addressee could entertain as true. And the intersection of C and D represents all the beliefs both the speaker and the addressee could entertain as true about which beliefs both the speaker and the addressee could entertain as true. In part, this space within a space is constituted by the perceptual environment of the participants, or ‘context’ (E); in part, it is constituted by the discursive environment of the participants, or ‘text’ (F); and in part, it is constituted by the cultural environment of the participants (G). Human interaction builds on this intersubjective space: context, cotext, and culture are the roots and fruits of each other.

Starting out from the relation between meaning and motivation, we have arrived at the relation between cognitive process and sociohistorical commons; and, on the path in-between, we have stopped to examine some of the cages, claws, and keys of human agency.

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<sup>42</sup> And this in addition to inferring the function served by the dream per se—as a means of discharging excess libido, etc.

<sup>43</sup> Mead (1934) is perhaps the earliest account of this idea. And Sperber and Wilson (1986), with their account of mutual manifestness, is perhaps the most explicit. See also Dennett (1987); Enfield (2006); Hanks (1991); and Tomasello, Carpenter, Call, Behne, and Moll, (2005)

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