

## A PROGRAM FOR “NATURALIZING” METAPHYSICS, WITH APPLICATION TO THE ONTOLOGY OF EVENTS

### *1. Metaphysics and Cognitive Science*

I wish to advance a certain program for doing metaphysics, a program in which cognitive science would play an important role.<sup>1</sup> This proposed ingredient is absent from most contemporary metaphysics. There are one or two local parts of metaphysics where a role for cognitive science is commonly accepted, but I advocate a wider range of application. I begin by laying out the general program and its rationale, with selected illustrations. Then I explore in some detail a single application: the ontology of events. I do not push hard for any particular ontological conclusion, about either events or any other topic. The focus is methodology, not a particular output of the methodology.

Here is a recently published characterization of the metaphysical enterprise, one that probably captures orthodox practice pretty well and to which I take no exception.

Metaphysical investigations begin with initial appearances.... In everyday life, these appearances are seldom questioned. In metaphysics, we investigate further. As we pursue a metaphysical topic, we seek to get beyond appearances. We consider arguments about how things really are. We seek to learn the reality of the situation. Reality may confirm initial appearances or it may undercut them. Either way, our goal is to find the ultimate reality. This suggests that the subject matter distinctive of metaphysics is ultimate reality. (Conee and Sider 2005: 200)

The author of this passage, Earl Conee,<sup>2</sup> does not endorse the stated view unqualifiedly. He cavils at the claim that metaphysics is concerned with ‘ultimate’ reality, suggesting that ‘ultimate’ adds nothing of importance. He also worries that if metaphysics is simply concerned with reality, it doesn’t differ from other factual investigations. Leaving these quibbles aside, Conee seems to find this characterization of metaphysics fairly satisfactory, as would other metaphysicians, I suspect.

Although Conee doesn’t explicitly say this, ‘reality’ is normally understood to refer to what exists (in the broadest sense) in a *mind-independent* way. Metaphysics seeks to understand the nature of the world as it is independently of how we think of it. The suggestion that we should study the *mind* to understand real-

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ity would therefore strike many metaphysicians as wrong-headed. They would readily concede that a *portion* of metaphysics—the metaphysics of mind—has mind and mental states as its proper province. But the mind is just a fragment of reality. Most sectors of metaphysics are concerned with extra-mental reality. It would be grossly misdirected for those other sectors of metaphysics to aim their inquiries at the mind. Nonetheless, this is what I propose. I don't mean that a study of the mind is the *final* aim of all metaphysical inquiries; but it should be studied *in the course of* other metaphysical investigations. It should be a contributing part of metaphysical investigation, even those investigations for which the mind is not the primary target.

To clarify the proposal, it must be explained that the referent of 'the mind' is (or includes) the aggregate of *organs or mechanisms of cognition*. Cognitive organs or mechanisms play a critical role in the causal production of appearances, including metaphysical appearances (whatever exactly we take that to connote). In considering whether such metaphysical appearances should be accepted at face value or, alternatively, should be superseded through some sort of metaphysical reflection, it obviously makes sense to be as informed as possible about how these mechanisms of cognition work. That is why cognitive science is relevant.

Let me expand on this proposal. As Conee indicates, metaphysical inquiries usually start with default metaphysical assumptions, i.e., naïve, intuitive, or unreflective judgments. These correspond to what he calls "appearances." We intuitively judge that objects are colored, that people have free will, that some events cause others, that time passes (always flowing in the same direction), and that some possibilities are unactualized. Metaphysical inquiry starts from such default judgments, but it is prepared to analyze or interpret them in alternative ways, or even to abandon them altogether. They are all up for critical scrutiny, of one sort or another. How should we proceed in this critical, reflective activity? To what degree should precedence, or priority, be given to our naïve metaphysical convictions?

Virtually all metaphysicians agree that our default metaphysical views are subject to philosophical refinement. If there are inconsistencies among our naïve metaphysical views, some must be abandoned. In addition, most contemporary metaphysicians would agree that science should sometimes override our naïve metaphysics. Physics might give us reason to conclude that time doesn't "pass" at all; that it has no asymmetrical directedness; or, indeed, that there is no such thing as time, only space-time. Again, physics might give us reason to abandon certain assumptions about causal relations. Most existing appeals to science in defense of metaphysical refinements (or revolutions) are appeals to *physical* science. This is understandable, given that most of metaphysics is concerned with ostensibly non-mental targets (e.g., color, causation, time, possibilities). I

argue, however, that even in these sectors of metaphysics, evidence from mental science, that is, cognitive science, can and should be part of metaphysical inquiry.

There are at least two ways in which a metaphysician might try to “revise” naïve experience or naïve belief in matters metaphysical. First, a metaphysician might advance an *eliminative* thesis. This or that ontological phenomenon, assumed to exist on the basis of common sense or naïve experience, might be denied any sort of existence at all. This transpires when a metaphysician denies the existence of time or free will, for example, yet common sense affirms their existence.

Second, a metaphysician might propose a more nuanced kind of ontological revision of common sense or naïve experience. Starting with a naïve conception of a certain property, a metaphysician might suggest that the property is really different in crucial ways from the way common sense or experience represents it. The proposal does not deny the phenomenon’s existence (*some* phenomenon worthy of the name). It merely suggests that the property’s ontological status is importantly different from the way it is ordinarily represented. One such move is to claim that, although the property is ordinarily represented as being intrinsic to its bearers, it is in fact a relation between members of the class of bearers and another class of objects or events. For example, it’s a response-dependent property, a relation between the presumed bearers of the property and some class of mental responses that occur in the subject (perceptual responses, cognitive responses, or emotional responses). Although we think of ourselves as detecting a non-relational property, one that “resides” in the observed objects themselves, the claim is that there is no such “well-behaved” intrinsic property of the bearers. (The critic’s conception of well-behavedness may vary across revisionary theories. Some might require the property to be a “natural kind”, others a physical property, etc.) Instead, what unites the objects or events in question is only a relation between them and a class of subjective responses to them. This yields an anthropocentric property, rather than a well-behaved one. If it is to be revisionary, a response-dependence thesis must also show that there is a divergence between its true response-dependent character and its naïve “appearance”.

Cognitive science-influenced metaphysics need not be restricted to revisionary theories. Cognitive science might also introduce evidence that favors commonsense views. I concentrate, however, on how cognitive science might support revisionary claims. Here is an example.

In speech perception, we seem to hear boundaries of words. It sounds as if there are silences between words that enable us to distinguish their beginnings and ends. But this is an illusion. Steven Pinker (1994), a leading cognitive scientist, describes the matter as follows:

All speech is an illusion. We hear speech as a string of separate words, but unlike the tree falling in the forest with no one to hear it, a word boundary with no one to hear it has no sound. In the speech sound wave, one word runs into the next seamlessly; there are no little silences between spoken words the way there are white spaces between written words. We simply hallucinate word boundaries when we reach the edge of a stretch of sound that matches some entry in our mental dictionary. This becomes apparent when we listen to speech in a foreign language: it is impossible to tell where one word ends and the next begins. (1994: 159–160)

Although we seem to detect word boundaries in the speech of our native language, there are no such boundaries in the acoustic stimulus.<sup>3</sup> The experienced boundaries are supplied or constructed by the hearer's speech perception system, building on its knowledge of words in the language that are likely to be spoken. Moreover, even the sequences of sounds we think we hear within a word are an illusion. Information about each component of a word is smeared over the entire word, and this information is reconstructed or reassembled by the listener's system.

So what shall we say about the metaphysics of word boundaries? One could adopt eliminativism. That is the view suggested by Pinker's term 'hallucinate'. But there is also another option: a response-dependence maneuver.<sup>4</sup> Perhaps word boundaries consist in relations between the spoken sequences of sounds and the auditory experiences of hearers who understand the language in question. Word boundaries are tendencies for such sound sequences to produce "boundary" experiences in (suitable) hearers. These tendencies are genuine relational properties, actually instantiated. So the response-dependence move is not equivalent to eliminativism. Nonetheless, it is clearly a revisionary view relative to naïve experience, because auditory experience represents word boundaries as being features intrinsic to the speech signal.

The evidence that might support such a response-dependence maneuver includes the evidence Pinker adduces from cognitive science. The acoustic properties of speech signals are studied in the laboratory. These are the kinds of studies on which Pinker bases his conclusions. The same holds for other studies that support the notion of a specialized sense for speech, which is responsible for the mental creation of our phonetic experience. Conjectures on these matters might be made on the basis of casual observation rather than scientific experimentation, especially of felt differences when hearing one's native language versus a foreign language. But really strong evidence against naïve realism and toward either eliminativism or response-dependence comes from research in cognitive science. Cognitive science cannot adjudicate between the two revisionary theses. Philosophical reflection must assess the advisability of eliminativism versus response-dependence. But evidence from cognitive science tilts strongly against realism (or intrinsicism) about audible word boundaries.

The ontological status of word boundaries is not a very significant metaphysical topic. So let me turn to a more salient example in metaphysics: color. Here I focus on a slightly different issue than response-dependence, but one that again shows how cognitive science can be relevant.

Since ancient times, philosophers and physical scientists have offered “secondary quality” accounts of color. These are response-dependence or dispositional theories, which treat colors as (“merely”) dispositions to produce certain visual experiences in normal perceivers. On this type of approach, redness is the disposition to look red to standard perceivers in standard conditions of visual observation. This is a revisionary approach because color doesn’t “present itself” as a disposition to look a certain way. Redness presents itself (in visual experience) as being “in” objects themselves, or on their surfaces. Thus, in place of dispositional theories, several contemporary theorists propound the view that colors are the *categorical bases* of such dispositions. Brian McLaughlin characterizes redness (in part) as “that property which disposes its bearers to look red to standard visual perceivers in standard conditions of visual observation” (2003: 100). As McLaughlin explains, this is not a dispositional theory of color properties. A dispositional property is a functional-role property. On McLaughlin’s theory, by contrast, a color property is the *basis* or *ground* of a functional role. Redness is the *occupant* of the redness role. More fully, McLaughlin says that being a basis for the disposition of objects to look red doesn’t suffice for being redness; to be redness, “a property must be a basis *common* to all things so disposed” (2003: 102, emphasis added). He also implies that, to be redness, a property must be the *unique* property that occupies the redness role.

McLaughlin proceeds to pose three problems for such an occupant, or role-player, theory, two of which I’ll mention here. First is the problem of the “common ground.” Is there a (physical) categorical property that all red things have in common? The phenomenon of metamerism, identified by color science, seems to stand in the way. What is seen as a single color can be produced by a single light-wave frequency or by many different combinations of light-wave frequencies. As C. L. Hardin notes: “if an observer’s unique yellow [yellow that is not at all greenish or reddish] were at 575 nm on the spectrum [in a certain observational setting], an appropriate mixture of spectral 550 nm and 650 nm light would match it exactly” (1988/1993: 198). So there doesn’t seem to be any common basis of the disposition to produce an experience of unique yellow. Second is the problem of multiple grounds. If there is more than one common basis of the disposition to look red in circumstances C, then it’s not the case that there is some property that is *the* property that disposes its bearers to look red to standard perceivers in circumstances C.

The problem of the common ground and the problem of multiple grounds flow directly from the demands imposed by the role-occupant theory. The ques-

tion is how serious these problems are and whether they can be satisfactorily solved. Cognitive science is relevant here, first in creating at least one of the problems and second in helping to solve it. The problem of the common ground is made particularly salient by metamerism, and metamerism is a phenomenon discovered by cognitive science. Although McLaughlin thinks that the problem of multiple grounds can be adequately solved by purely philosophical maneuvers (2003: 125-126), the problem of the common ground is viewed as one that can only be solved with the help of vision science. McLaughlin appeals specifically to the opponent-processing theory of color vision (Hurvich and Jameson 1957) (see McLaughlin 2003: 128-131). Opponent processing theory is also the product of color science (indeed, the cognitive science branch of color science). Whether McLaughlin's considerations succeed in solving the problem of the common ground I shall not try to settle. The point is simply to illustrate how detailed theories of color properties can readily encounter problems when confronted with empirical facts of the sort cognitive science uncovers. At the same time, cognitive science can often help solve some of those problems.

As things go with color, so they go with other properties that invite either a dispositional treatment or a categorical basis treatment. Another example of this type is disgustingness. Now it's not entirely clear how our ordinary conception of disgustingness should be elucidated. But let us mainly focus on a property that, on reflection, seems worthy of being the referent of the term 'disgusting' (just as redness is the referent of 'red').

If disgustingness is the ground of the disposition to elicit feelings of disgust, mustn't it be a property common to all disgusting things, as in the case of redness? Is there any such common ground? Cognitive science findings make such a thesis problematic. The emotion of disgust has a remarkably diverse range of elicitors, which range from the concrete to the abstract. These are summarized by Daniel Kelly (2007). At the concrete end of the spectrum of disgust elicitors are feces, vomit, urine, and sexual fluids (Rozin *et al.* 2000). Other likely candidates are corpses and signs of organic decay (Haidt *et al.* 1994). Bodily orifices and, via contamination, things that come in contact with them are also powerful elicitors (Rozin *et al.* 1995). All of these elicitors are disgust universals. Finally, disease and parasitic infection provide another set of disgust universals (Curtis *et al.* 2004). At the abstract end of the spectrum, violations of norms having nothing to do with the types of elicitors just mentioned can also trigger disgust. Flouting a norm central to a cultural ingroup, for example, can produce an emotion of disgust.

What could possibly be a common ground among these diverse elicitors? It seems unlikely that there is any such property. If there is one, it surely isn't a natural kind, at most, a wildly heterogeneous disjunction of properties. If dis-

gustingness is either an intrinsic property shared by all disgust elicitors or nothing at all, eliminativism looms.

So let us consider the alternative approach: dispositionalism or response-dependence. On this view, disgustingness is simply the disposition to produce a disgust response in humans. But what, precisely, is the response? Kelly (2007) divides the disgust response into three parts, of which I'll emphasize two. The first part concerns the so-called affect program for disgust, where “affect program” is a theoretical term for reflex-like emotional responses, a set of coordinated physiological and behavioral elements. In the case of disgust, the responses include (1) a behavioral response involving immediate withdrawal, (2) a distinctive facial expression, known as the “gape face,” and (3) qualitative responses including revulsion and the physiological concomitants of nausea (Ekman 1992). The second part is what Kelly calls, following Rozin *et al.* (2000), “core disgust.” Its features are distinct from those of the disgust affect program; they are less reflexive and more cognitive in nature. Two of its central features are a sense of offensiveness and contamination sensitivity. Offensiveness is a type of aversion that views the disgusting entities as somehow dirty, tainted, or impure. Contamination sensitivity refers to the fact that once an item is marked as offensive by the disgust system, the item can contaminate otherwise pure and un-disgusting entities. Entities so contaminated are then treated as disgusting. Moreover, there is an asymmetric relationship between disgustingness and purity. It is far easier for something pure to be contaminated than it is to purify something contaminated. A single drop of sewage can spoil a jug of wine, but a single drop of wine doesn't much help in purifying a jug of sewage (Hejmadi *et al.* 2004).

Returning now to the dispositional approach to disgustingness, exactly which responses are constitutive of this disposition? Are they *all* constitutive of it? Here is a different way to approach the problem. Since we are already dealing with revisionary accounts of disgustingness, why assume there is a single property? Why not distinguish different disgustingness properties, so as to cut nature better at its joints? One way to do this is to bifurcate disgustingness in terms of the two families of responses: the affect program responses and the core responses. We would then have  $\text{DISGUSTINGNESS}_1$  and  $\text{DISGUSTINGNESS}_2$ , where the former is a disposition to produce affect-program responses and the latter is a disposition to produce core-disgust responses.

No matter which choice we make in this territory, the choice should reflect knowledge of the types of functional (and evolutionary) relations that I have been presenting from cognitive science research. Any natural slicing of the terrain should be informed by the relevant empirical facts, not restricted to what can be known about disgust and disgustingness a priori or via common sense alone.

Finally, I turn to the case of moral concepts. There is powerful evidence from recent cognitive science that moral judgment is intimately associated with emotion. This might naturally lead to a response-dependence account of our moral concepts, as recently argued by Jesse Prinz (2006). Of course, a number of moral philosophers in recent decades have advanced “sensibility” accounts of moral concepts, in the general tradition of Hume. These include McDowell (1985), McNaughton (1988), Johnston (1989), Dreier (1990), Wiggins (1991), and Wright (1992). The point is not that it takes cognitive science to think up such a position in metaphysics; rather, cognitive science is uniquely able to contribute certain kinds of compelling evidence, evidence that might tilt meta-ethical or metaphysical arguments in one way or another. Here is some of the relevant psychological evidence that supports a response-dependence view in meta-ethics.<sup>5</sup>

Moll *et al.* (2003) measured brain activity as subjects evaluated moral sentences. They found that when subjects made moral judgments (but not when they made factual judgments) brain areas associated with emotions were active. Sanfey *et al.* (2003) measured brain activity as subjects played an ultimatum game. When a division of a monetary sum was deemed inequitable, a player had brain activity in areas associated with emotion. Berthoz *et al.* (2002) found similar engagement of brain areas when subjects considered violations of social rules. Again, Greene *et al.* (2001) found emotion activation as subjects considered moral dilemmas. In a different kind of study, Schnall *et al.* (forthcoming) found that negative emotion can lead people to make a more negative moral appraisal than they would otherwise. Subjects were given a questionnaire with a series of vignettes and asked to rate the wrongness of the actions described. Half of the subjects who read the vignettes were seated at a nice clean desk; the other half were seated at a filthy desk. The latter rated the vignettes as more wrong than the former. Finally, there is considerable evidence that psychopaths, who seem incapable of making genuine moral judgments, are profoundly deficient in negative emotions (Blair *et al.* 2001).

Again, there is room for debate over which meta-ethical/metaphysical theories of moral concepts or moral properties should be inferred from these studies. The present point is the fairly mild one that empirical studies are profoundly important in helping us (as theorists) understand the ordinary grasp of moral matters, which is part of the task of doing metaphysics in the ethical realm. What is especially noteworthy is that affective entanglement with moral judgment is not evident in conscious experience. It presumably occurs, for the most part, at a sub-threshold level, which is why cognitive science and neuroscience are needed to tease out what takes place. Astute philosophers (such as Hume and his intellectual descendents) can tender such hypotheses, but their suspicions are not conclusive, and indeed are hotly disputed by other philosophers. One needs a

cleaner methodology, one not beholden to conscious awareness, to get sounder and more decisive evidence on the matter.

For evidence on the role of emotion even in everyday “factual” judgment, consider another phenomenon discovered by cognitive science. This concerns the fascinating delusional symptom called *Capgras syndrome*. In the Capgras syndrome, people report that their acquaintances (spouse, family, friends, and so on) have been replaced by “body doubles” (Capgras and Reboul-Lachaux 1923). They acknowledge that their husband or wife looks like their husband or wife (respectively). They can pick the person out from a line-up as resembling their husband or wife, but they steadfastly maintain that he or she is an impostor. Apparently, they consciously recognize the person’s face, but they lack an emotional response to it.<sup>6</sup> They therefore conclude that the person observed isn’t in fact the husband, wife, friend, etc.<sup>7</sup> Of special interest here is what the Capgras syndrome tells us about normal people. Although we are quite unaware of this, we apparently use emotional associations, at a sub-threshold level, in identifying a person. I am not gearing up, on this basis, to defend a response-dependence account of personal identity. I add this item to the mix only to underline the point that what transpires in judgment making and concept possession is not introspectively transparent. This is why metaphysics needs cognitive science—at least insofar as metaphysics proceeds by starting from our naïve world-view and proceeding “outwards” from there.

In the remainder of the paper, I illustrate the cognitivist program with a rather different example: the metaphysics of events. The angle I shall highlight again turns on the fact that the ways we conceptualize many types of entities of metaphysical interest are not available to introspection. We need the help of cognitive science to illuminate these conceptualizations. This is especially true in the case of “minor entities,” the focus of the present journal issue.

## *2. Events and the Problem of Event Individuation*

Let us approach the metaphysics of events while looking over our shoulders at the metaphysics of time and disgustingness. In the case of time, a variety of scientific theorizing, especially in physics, suggests that there is no such thing as time, at least as naively experienced. The flow of time, the existence of something called “the present,” and the directionality of time are all problematic from the standpoint of physics. But if time is anything at all, it cannot be something merely in our minds. So what external “thing” can be nominated by the word ‘time’? Metaphysicians struggle with this problem. It will not do to pick out *any* old metric or dimension that is countenanced by contemporary space-time physics and *call* it time. Metaphysicians look for a property or dimension of the space-time manifold that comports as closely as possible to our naïve understanding or grip on time, that is, our time experience. But when we try to look at

what that understanding or experience consists in, we need help from cognitive science. To identify a suitable *physical* dimension to identify with time, we need a better grip on our *anthropocentric* conception of time; and that may require an understanding of temporal *psychology*.

The case of disgustingness has parallels. If we want to understand what disgustingness is, we need to understand the psychology of disgust (the emotion). Disgustingness may prove to have an additional parallel with events, as I shall later suggest. As we have seen, once the relevant facts are learned about disgust and its family of elicitors, we see that a good case can be made for *bifurcating* the phenomenon of disgustingness. Instead of positing a single kind of state, it may make better sense to posit two types of disgustingness. A strong case for such a proposal, however, hinges partly on empirical findings about the internal responses associated with disgust. Similarly, I shall argue, certain philosophical preconceptions about events should give way once we have a better grip on the way we (psychologically) conceptualize items that can be considered events. Instead of positing a single ontological category of events, it is better to posit a *pair* of such categories.

The preceding paragraph describes where we are headed. Now let me set the stage for the discussion by making some preliminary clarifications. There are narrower and wider uses of the term ‘event,’ colloquial uses and technical uses. These different uses indicate that different writers about events have different targets in their cross-hairs. Colloquially, events are equated with *happenings*: things that *occur*, or *take place*, which can’t be said of objects like books or statues. A variety of theories conceive of events rather differently, however (Casati and Varzi 2007). There are scientific theories that treat events as qualified points in space-time (General Relativity), or as sets of outcomes (probability theory); and some philosophical theories treat events as properties of cross-world classes of individuals (Lewis 1986). These technical uses are put aside for present purposes. Another distinction is between *event-types* and *event-tokens*. The term ‘crash’ can be used to refer either to a general type of event or to individual events that occur on particular occasions. Our principal interest is event tokens.

In the 1960s and 1970s a lively debate emerged about the problem of event individuation and the nature of events. Some philosophers, most prominently Donald Davidson, championed a view that came to be called the coarse-grained, or unifier, approach. This was initially motivated by the theory of action, where actions, of course, are a subcategory of events. Davidson’s unifier approach is succinctly illustrated by the following passage about actions:

[I]t is hard to imagine a satisfactory theory of action if we cannot talk literally of the same action under different descriptions. Jones managed to apologize by saying ‘I apologize’; but only because, under the circumstances, saying ‘I apologize’ *was* apologizing. (1969/1980: 164-165)

There aren't two distinct actions of Jones, his saying 'I apologize' and his apologizing; these actions are one and the same. Similarly, if Oliver moves his finger, flips a switch, turns on a light, and alerts a prowler, all these actions are identical with one another.

Multipliers contend that Oliver's actions are four distinct actions. The multiplier position was developed (semi-)independently by Jaegwon Kim (for events generally) and me (for actions) (Kim 1966, 1969, 1973, 1976; Goldman 1965, 1970, 1971). We each defended a general account of events or actions as exemplifications of properties. In Kim's well-known formulation, event E is identical with event E' only if they have as "constituents" the same substance(s), the same property or relation, and the same time (Kim 1976). For example, the dyadic event consisting of the collision of the *Titanic* with the iceberg has as its two substances the ship and the iceberg, as its relation *colliding with*, and as its time a period of around ten seconds on the fateful night (Simons, 2003). In the Oliver case, the switch-flipping action is not identical to the prowler-alerting action because they involve both different substances (the switch versus the prowler) and different relations (flipping versus alerting). No comparably agreed upon principle of individuation is associated with the unifier theory.

The unifier approach commanded a majority of adherents in the 1960s and 1970s, and this probably remains true today. Because the property-exemplification approach has been a minority view, I begin the present discussion with a limited defense of it. The purpose is not to defend it as *the* correct theory, but only as a serious contender. So let me review some considerations in its favor and some of the dialectic that has characterized the debate.

Here are some arguments from causal relations that I advanced in the early period of debate (Goldman 1970, 1971). Consider these actions:

- (B1) Boris's pulling (of) the trigger
- (B2) Boris's firing (of) the gun
- (B3) Boris's killing (of) Pierre.

According to the unifier approach,  $B1 = B2 = B3$ . If this is correct, every effect of B1 must equally be an effect of B2 and B3. Now consider the following event:

- (F) the gun's firing

Is F an effect of B1? Surely it is. The pulling of the trigger causes the gun to fire. Is F an effect of B3? Apparently not; it certainly sounds wrong to say that Boris's killing (of) Pierre caused the gun to fire. Hence, some effect of B1 is not an effect of B3, a counterexample to the unifier approach. This assumes, of course, that if X and Y are identical, then there are no properties possessed by X that Y lacks. This principle holds for causal-relational properties among others.

Davidson tried to ward off this kind of difficulty by arguing that the singular term “Boris’s killing (of) Pierre” should be translated (roughly) as the definite description “The action of Boris that caused Pierre’s death”. The denotation of this expression is said to be B1, and since F is an effect of B1, it is also an effect of B3. But the proposed translation is contentious. If the translation is correct, why does it seem intuitively incorrect to say that Boris’s killing (of) Pierre causes the gun to fire?

Here is another example. John sings; indeed, he sings loudly and off-key. Are the following identity statements true: John’s singing (J1) = John’s singing loudly (J2) = John’s his singing off-key (J3)? The unifier theory affirms these identity statements. But consider John’s being angry (A) as a candidate cause. Suppose that state A was a contributing cause of J2, because the loudness of John’s singing was an inadvertent effect of his anger. Although state A is a contributing cause of J2, it’s implausible that it’s a contributing cause of J1, because the decision to sing was independent of the angry mood. Since one of the causes of J2 is not a cause of J1, we must conclude that  $J2 \neq J1$ , and another counterexample confronts the unifier theory (Goldman 1971).

This kind of difficulty has resurfaced in more recent literature on causation. L. A. Paul (2000) gives the example of Suzy who falls and breaks her right wrist while skiing. The next day she writes a philosophy paper. Simplifying Paul’s example, note that Suzy’s breaking her right wrist is plausibly a contributing cause of her writing the paper *with her left hand*, but it isn’t a contributing cause of her writing the paper. Now Paul does not regard this point (or the rest of her example) as grounds for endorsing the property exemplification view of *events*. She introduces the term ‘aspect’ to refer to property instances, but doesn’t identify them with events. An aspect can be a property instance *of* an event; it doesn’t have to *be* an event. Paul proceeds to argue that aspects, rather than events, are causes and effects. This position has substantial affinity with the multiplier theory because it views property-individuated entities (*viz.*, aspects) as the bearers of causal properties, a role usually assigned to events.

Notice that the parties to the debate agree on two things. First, they agree that there are such things as events. Second, they agree that exactly one of the two approaches is correct; the task is to determine which one that is.<sup>8</sup> For purposes of this debate, then, eliminativism isn’t an option.<sup>9</sup> It also isn’t an option to consider *both* theories to be correct, since one view explicitly denies what the other asserts, *viz.*, the identity of several enumerated items. It is premature, however, to exclude this possibility. Perhaps there are two viable concepts or conceptions of events: under one the unifier view is correct, and under the other the multiplier (property-exemplification) view is correct. I shall now try to show how cognitive science lends support to this compromise position.

### 3. *Two Systems of Representation and Their Relevance to the Ontology of Events*

The thesis I wish to advance is that the mind has two ways of representing events, or two cognitive formats for event representation. I don't mean that there are two representational systems dedicated exclusively to events, but two different systems that can be used to represent events *among other things*. Crucially, they represent events using different representational principles, and this gives rise to different intuitive principles of identity or individuation.

It is arguable that Jonathan Bennett's (1988) theory of events recognizes this kind of point. His position might be encapsulated by saying that people get us to feel multiplier intuitions by using one set of event names (“the killing of the man”) and the unifiers use another set of event names (“the murder”). If Bennett's theory approximates the one I'll offer, that's fine from the present perspective. But the one I shall present has a more explicit basis in cognitive science, at a level below the level of language.<sup>10</sup>

The general idea of multiple systems or formats of mental representation for (roughly) the same target domain is extremely common in cognitive science. One example is the two systems of visual representation: the ventral and dorsal systems (Milner and Goodale 1995). Conscious visual experience of the world is subserved by the ventral visual stream, which generates conscious visual perception of objects. In addition, the recently discovered dorsal visual system unconsciously mediates the visual control of motor behavior (e.g., reaching for a cup that is in view). That there are two distinct systems is evident from neurological dissociations in certain patients, in which one system, but not the other, is impaired. These systems deploy different types of representation, although each is activated by visual inputs.

The study of cognitive processes directed at events and actions is fairly recent. Some of this research is specifically focused on the *individuation* of actions and events, although the particular individuation problem psychologists study is a bit different from the one metaphysicians concern themselves with. We will have to tread carefully. Nonetheless, here is a passage by the psychologist Karen Wynn that indicates what motivates her interest in the subject.

[V]irtually nothing is known about how people individuate actions. The individuation of actions is likely to be complex because actions are not definable purely in terms of objective properties. Frege's ... observation that number is not an inherent property of portions of the world applies as much to actions as it does to physical matter. Just as a given physical aggregate may be an instance of many different numbers (three forks is also an instance of 12 tines, 2 decks is an instance of 104 cards), so may a given portion of activity (one dance may equally be an instance of 437 steps, one speech may be an instance of 72 utterances). There is no objective fact of the matter as to where, in the continuously evolving scene, one “action” ends and the next “action” begins. The individuation of discrete actions from this continuous scene is a *cognitive imposition*. (Wynn 1996: 165, emphasis added)

Of special interest to developmental psychologists (including Wynn) is how infants manage to parse the ongoing activity of the world into distinct actions (or events). Infants' parsing abilities should interest us as well, since they bear on the question of what representational capacities are also available to adults for individuating actions and events.

Sharon and Wynn (1998: 357) proceed to enumerate several reasons why an ability to individuate actions and events is essential to the infant. First, such parsing is required to perceive causality. For example, to recognize causality in a "launching episode"—say, where a billiard ball causes movement in another billiard ball by striking it—it wouldn't be possible to recover the causality if the whole motion of the two balls were perceived as one undifferentiated swoosh. Second, individuating actions is a necessary precursor of learning to produce them. A child who wants to throw a ball should realize that pulling back one's arm is a necessary component of the throw, but jumping up and down in excitement afterward is not. A third major motivation for parsing motion into discrete actions lies in the need to interpret the behaviors of others. Parsing motion into discrete acts provides the behavioral units that are explainable in terms of desires and beliefs. Finally, an ability to parse actions into the same units as other people do is necessary for verb acquisition and hence linguistic communication. For language to be comprehensible, two people must have in mind the same bounded pattern of motion when they refer to a "jump," a "hug," or a "hit."

What cues might infants use to individuate actions? Ideas are suggested by studies of individuation in other domains. Spelke (1988) found that infants construe spatially separated surfaces in the visual layout as belonging to distinct objects. Similarly, Bregman (1990) demonstrated that portions of acoustic energy that are temporally separated by silence are interpreted by adults as arising from independent acoustic events, whereas energy that is temporally continuous and judged to originate from the same location is commonly interpreted as arising from the same acoustic event. These findings suggest that infants may use spatiotemporal discontinuities to segment scenes of motion into distinct units. Portions of motion separated by "gaps" in space, time, or both may make different actions. This hypothesis was tested and corroborated by Wynn (1996). In a first test, infants were able to count—hence must have individuated—the jumps of a puppet when there were brief pauses between jumps. In a second test, motionless pauses were replaced by having the puppet gently wag its head back and forth between jumps. Infants were still able to detect boundaries between jumps, though not as strongly as in the first test. Sharon and Wynn (1998) extended these findings, but they also showed that infants are not able to parse heterogeneous actions from a continuous, nonpatterned stream of motion.

The possibility of two distinct systems for action or event individuation was suggested by findings on the individuation of objects. Another study by

Spelke and colleagues supported the notion that young infants analyze spatio-temporal continuity in establishing representations of one object or two. Spelke, Breinlinger, Macomber and Jacobson (1992) arranged a scene with two screens separated by a gap. Young infants who saw objects emerge one at a time from opposite sides of the two screens but never appear in the middle interpreted this as two objects, not one. This was another example of the significance of spatio-temporal continuity. (If there were one object, continuous motion would have required it to appear in the gap between the screens.) However, by 12 months of age, infants bring *kind membership* to bear on the problem of object individuation. Xu and Carey (1996) found that when 12-month-old infants were shown objects of two different kinds emerging one at a time from opposite sides of a single screen, they established representations of two numerically distinct objects. This couldn't have been inferred on the basis of spatio-temporal continuity considerations alone, because such considerations would be compatible with a single object. Shipley and Shepperson (1990) also used counting as a wedge into studying preschool children's criteria for object individuation. Children were shown displays of objects, some of which were broken. For example, there might be three intact cars and one car broken into two distinct pieces. Even when asked to count “the cars,” children as old as 5 years would often count each separate piece of a car, along with each intact car (yielding a total count of five, in the foregoing example). This is despite the fact that 5-year-olds would have known the kind word “car” for some time. Still, when considering a scene consisting of whole cars and split cars, children analyzed the scene in terms of spatio-temporally discontinuous units, not units determined by the “basic-level” kind term “car.” This tends to show that although 5-year-olds have the capacity to individuate on the basis of kinds, or sortals, they have a preference for the apparently more primitive spatio-temporal criterion of object individuation.

What about event individuation? Wagner and Carey (2003) compared children and adults on individuation tasks concerning both objects and events. Shown a series of slides on a computer screen, subjects were asked for each slide, “How many Xs are here?” The X term was either an appropriate kind label for the object (e.g., “car,” or “fork”) or else a kind-neutral word (e.g., “thing”). Following the object task, children were told that the game was going to change and now they would count what happened in movies (the event individuation experiment). Here the analogous term X was an appropriate event description, targeting either the goal of the event or its temporally discrete sub-actions. The latter was considered a spatio-temporal parse of the observed activity. In both the object and event cases, children showed a spatio-temporal bias in individuation. They often ignored the kind term (or goal-based term) that was specified and counted in terms of purely spatio-temporal criteria. Nonetheless, even by age 3 and definitely by age 5, they showed some sensitivity to kind-based indi-

viduation. Adults, by contrast, were at or near ceiling in their use of kind-based (or goal-based) individuation.

All the studies and theoretical interpretations we have reported are from developmental psychology, which focuses on the growth or unfolding of cognitive competences. The development angle is not our primary interest, however. We are concerned with the cognitive competences of adults, because common sense ontological judgments issue mainly from adults (philosophers themselves, in most cases). The main point I wish to make is that adults apparently have two systems for individuating events, one system based on spatio-temporal discontinuities and a second system based on kinds. The first is a very early developing system and the second is not quite so early developing. I report evidence from developmental psychology not because I am intrinsically interested (here) in infants and children but because it happens to be the branch of cognitive science where the most relevant work on event individuation has been done.

The psychological research just reviewed is the main, already existing, empirical work most relevant to the metaphysics of events, but admittedly it isn't as directly relevant as one might wish. It isn't fully and squarely relevant because the individuation issue addressed in cognitive science is different from the individuation issue discussed in section 2. The psychologists are concerned with event *segmentation*, or *parsing*. This is decomposing the world's spatio-temporal flux into disjoint units. The philosophers are concerned with events occurring at one and the same time and place.<sup>11</sup> Arguably the two questions are connected, but they aren't the same.

Consider the example from section 2 in which Boris pulls a gun's trigger and thereby fires the gun. The trigger-pulling and the gun-firing both occur at the same time and place. But we can still ask whether additional ontological slicing should be done. Are the trigger-pulling and the gun-firing two *distinct* actions, or are they one and the same action, simply described in terms of different effects? I'll call this new question the *slicing* question. It isn't one that the psychology literature addresses. Although the psychological work does not squarely address the slicing question, it may be indirectly relevant. Recognition of the two disparate systems can help us diagnose the emergence and persistence of the dispute between unifiers and multipliers.

The property-exemplification view assigns a pivotal role to the kind or property of which a token action or event instantiates. According to this approach, if action *a* is a token of action-type *A* and action *b* is a token of action-type *B*, then *a* is not identical to *b*, even if *a* and *b* are performed by the same agent at the same time. Boris's pulling the trigger (at *t*) and Boris's firing the gun (at *t*) are not the same token action, because pulling the trigger and firing the gun are not the same property or kind. This conceptualization of actions or events comports with the second, late-developing system of event representa-

tion, in which kinds (or sortals) play a crucial role. By contrast, the unifier view of actions or events assigns no comparably pivotal role to kind-differences in action or event individuation. According to the coarse-grained approach, Boris's pulling of the trigger and Boris's firing of the gun are one and the same action. Is it plausible that this conceptualization of actions is associated with the first, early-developing system of event representation, a system focusing on spatio-temporal factors without attention to (other) kinds? I think it is plausible.

If purely spatio-temporal representations are used to represent actions, it is natural to represent them as bodily movements only, not as entities with higher-order, non-geometric or non-kinematic properties, such as firing the gun, poisoning the king, or writing a cheque. Interestingly, the leading proponent of the coarse-grained theory, viz. Davidson, explicitly says that actions are, really, just bodily movements:

We must conclude, perhaps with a shock of surprise, that our primitive actions, the ones we do not do by doing something else, [are] mere movements of the body—these are all the actions there are. We never do more than move our bodies; the rest is up to nature. (1971/1980: 59)

According to Davidson, what many philosophers of action call "basic actions" are the only actions there are. He does not mean to deny, of course, that grander-sounding things like sending spaceships to Mars also are included among our actions. He certainly doesn't deny that these types of descriptions can be applied to our actions. But these "other" actions are just identical to the basic ones, which are movements of the body (e.g., the finger movement that depresses the button that launches the spaceship). This fits a purely spatio-temporal construal of action, which conforms comfortably to the constraints of the conjectured early-developing system of event representation.

A different take on event individuation emerges if one focuses on event-referring expressions such as "Quisling's betrayal of Norway" or "Quisling's betraying Norway," both of which are derived from the indicative sentence "Quisling betrays Norway." Verbs pick out kinds or sortals, which typically abstract from the spatio-temporal properties displayed by their particular instances. If one mentally represents an event by concentrating on the abstract property by which it is specified, this conceptual mode of mental representation would naturally be processed by the later-developing system for event representation.

My hypothesis, then, is that the two groups of partisans in the event-slicing debate are theorizing about the referents of two different types of mental representations, either event representations in the spatio-temporal system or event representations in the kind-based system. Both groups of partisans, of course, have access to both systems of representation, but when they engage in philosophical reflection about events they implicitly focus on representations from one system rather than the other; and they differ on which system of representations

they select. Since Davidson did not dispute the existence of “grander” actions—he did not deny that bodily movements have “higher-order” properties in addition to geometric or kinematic ones—he did not mentally represent actions *exclusively* by means of the spatio-temporal system. He used the kind-based system as well. However, he might have privileged, or concentrated on, the deliverances of the spatio-temporal system as compared with the kind-based system. This is my conjecture. In other words, I don’t suggest that unifiers turn off their kind-based system when thinking (during everyday business) about events. Nor do I suggest that property-exemplification theorists turn off their spatio-temporal system when thinking about events. It is only a matter of which representational format is given greater weight or preference in one’s theorizing moments. Each representational format can be a source of intuitions about events. A theorist merely chooses to accentuate one family of intuitions rather than another. Nor do I mean to deny that the two types of theorists are unmoved by the various philosophical principles that are proposed and debated. Obviously they are so moved. Nonetheless, I suspect that theorists of different persuasions *dwell* more persistently (in their minds) on one family of intuitions as compared with the another, and that’s a non-negligible factor in what influences their theoretical judgments.

Let me return now to the comparisons drawn earlier (at the beginning of section 2) with the metaphysics of time and disgustingness. In both cases the (initial) question is: what is the property in the world that makes the best fit with a term used uncritically and unreflectively to characterize objects or relations in the world? As the example of time illustrates, finding a suitable fit may not be an easy matter. There may be “less” in the world than what our cognitive structures incline us to suppose. As the disgustingness example illustrates, we may also find that things in the world—and in our cognitive and emotional repertoire—offer a more complex array of alternatives than offered by our language. (The latter offers just a single predicate ‘disgusting’ and its approximate synonyms). In the case of disgustingness, I proposed that the best solution is to reject the assumption that there is a single property of disgustingness, even understood in response-dependent terms. Instead, there is DISGUSTINGNESS<sub>1</sub> and DISGUSTINGNESS<sub>2</sub>. Similarly, the metaphysical moral that may emerge (in part) from the findings of cognitive science is that we should abandon the original assumption of both unifiers and multipliers that exactly *one* of their views is right (the only interesting question being “which one?”). Instead we should conclude that both are right. The best solution is to countenance two metaphysical categories of events, EVENTS<sub>1</sub> and EVENTS<sub>2</sub>. This is how cognitive science can play a role in the conduct of metaphysicalizing.<sup>12</sup>

*Alvin I. Goldman*

*Rutgers University*

## NOTES

1. The theme of the present paper is very close to that of an earlier one: (Goldman 1989). In terms of the earlier paper’s division between “descriptive” and “prescriptive” metaphysics, the present paper emphasizes the “prescriptive” enterprise.

2. Although the passage appears in a co-authored book by Conee and Sider, Conee is listed as the lone author of the chapter containing this passage.

3. Instead of describing our auditory experience of word boundaries as featuring “silences” (as Pinker puts it), we might describe the matter in the language of “categorical perception.” The boundary between two words is perceived as being discrete and discontinuous, whereas in fact it is as non-discrete and continuous as what is perceived within a spoken word. Even in this formulation of the phenomenon, there is an illusion or error in our naïve representation of word boundaries that is open to correction by cognitive science. Thanks to Roberto Casati for emphasizing this alternative formulation.

4. Sarah-Jane Leslie suggested this as an example of response-dependence.

5. I cull this summary from Prinz (2006).

6. Evidence supporting this explanation was first produced by Ellis and Young (1990). They predicted that Capgras patients would not show the normally appropriate skin conductance responses to familiar faces, and this prediction was confirmed. Subsequent research has added further confirmation.

7. For an instructive novelistic account of the syndrome, see Powers 2006.

8. I assume that the unifier and multiplier approaches exhaust the territory. That assumption may appear problematic, because there is, for example, the “part” or “componential” view of events (Thalberg 1971; Thomson 1971, 1977), which treats some members of a candidate list of identical events as spatiotemporal parts of other members. For present purposes, however, the part theory will be considered a species of the multiplier view. It does, after all, answer the standard question of identity, in relevant types of cases, by saying “different” rather than “same.”

9. For a defense of eliminativism about events, see Horgan 1978.

10. Thanks to Dean Zimmerman for suggesting the parallel with Bennett. I am not convinced, however, that the two-conceptions-of-events thesis quite fits Bennett’s considered view. In chapter 8 of his book, Bennett says that a good semantics of event names should be intermediate between Kim’s view and Quine’s, where Quine defended a “zonal” view that identifies any two happenings in the same spatiotemporal zone. Bennett does not say that *both* kinds of semantics are right. On the contrary, he searches for a single intermediate position between them. He despairs of finding one, saying “The truth lies between Kim and the Quinean, but there is no precise point between them such that it lies there” (188: 126). In searching for a single intermediate position, Bennett appears to disavow a two-conceptions-of-events view, in which both conceptions are “correct”.

11. This characterization is slightly contentious, because many multipliers would deny that the events in question take place at the same time and place. For example, the time of killing a person might include the time of the victim’s death, making it longer than the time of pulling the trigger. The exact times and places of complex actions and events is a highly vexing issue. Nonetheless, the formulation in the text is a useful approximation.

12. Thanks to Roberto Casati, Holly Smith, and Dean Zimmerman for valuable comments on an early draft of this paper. Zimmerman was particularly helpful in persuading me that certain material contained in that draft might profitably be deleted (although those were not his words).

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