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EDITORIAL

Man is a rational animal who always loses his temper
when he is called upon to act in accordance with the dictates of reason.
—Oscar Wilde

I've often noticed how debates within the SSE community sometimes parallel debates in the political arena, perhaps especially with respect to the passion they elicit and the intolerance and condescension sometimes lavished on members of the "opposition." Occasionally, of course, the debates in the SSE are nearly indistinguishable from those in the political arena—say, over the evidence for human-caused climate change. But what I find most striking is how the passion, intolerance, etc.—perhaps most often displayed by those defending whatever the "received" view happens to be—betrays either a surprising ignorance or else a seemingly convenient lapse of memory, one that probably wouldn't appear in less emotionally charged contexts. What impassioned partisans tend to ignore or forget concerns (a) the tentative nature of both scientific pronouncements and knowledge claims generally (including matters ostensibly much more secure than those under debate), as well as (b) the extensive network of assumptions on which every knowledge claim rests.

So I'd like to offer what I hope will be a perspective-enhancer, concerning how even our allegedly most secure and fundamental pieces of *a priori knowledge* are themselves open to reasonable debate. A widespread, but naïve, view of logic is that no rational person could doubt its elementary laws. But that bit of popular "wisdom" is demonstrably false. And if that's the case, then so much the worse for the degree of certitude we can expect in more controversial arenas. Let me illustrate with a few examples.[1]

Consider, first, an empirical context in which some people have tried to deploy a logical law. In philosophical discussions of the nature and structure of the self, many writers invoke some version of the *law of non-contradiction* to argue for the existence of distinct parts of the self. This strategy is at least as old as Plato and may be more familiar to *JSE* readers in the form it took with Freud. Ironically, though, these arguments highlight just how insecure this dialectical strategy is (for a more detailed account, see Braude, 1995, Chapter 6).

Consider: In debates about the nature of multiple personality/dissociative identity disorder (MPD/DID), many argue that because different alter personalities/identities can apparently have different and even conflicting epistemic states, that there must be distinct parts of the self corresponding to the conflicting states. So Kathleen Wilkes writes:

> We break this law [of non-contradiction] as soon as we permit ourselves to say that one and the same entity both knows and does not know that *p*, for nothing can, at time *t*, be said to φ and not to φ. (Wilkes 1988:142)

Of course, to those without any philosophical axe to grind, cases of DID might suggest that one can indeed be said to φ and not to φ at the same time. Since that could easily be taken to suggest that the law of noncontradiction has some hitherto unacknowledged limitation, and since one must always be open to the possibility that logical laws have limitations of one sort or another, let's examine the status of the law which some dissociative and other phenomena appear to violate.

Notice, first, that what logicians generally consider to be the law of noncontradiction is either (a) the formal, syntactic law "~(*A* · ~*A*)," usually rendered more informally as "not-(*A* and not-*A*)," or else (b) a claim in logical semantics about truth-value assignments, namely, "no sentence can be both true and false" (or alternatively, "the conjunction of any sentence *p* and its denial not-*p* is false"). But the first of these is not violated by dissociative conflicts, and the second is not even clearly a law.

Consider the syntactic law first. It concerns the *form*, rather than the content, of strings of symbols within a formal system. It takes any compound expression of the form "not-(*A* and not-*A*)" to be a theorem, for any well-formed formula "*A*". But strictly speaking, the law does not pertain to sentences of any actual natural language. The syntactic law of noncontradiction does nothing more than sanction a particular arrangement of expressions within a certain set of formal systems. And although one can easily determine which symbolic expressions are theorems, those logical systems do not, in addition, offer a decision procedure for determining which sentences in a natural language are true or false. On the contrary, the relationship of formal to natural languages has to be both stipulated and investigated. And ultimately, the utility of a formal system of logic has to be evaluated empirically, by seeing whether or how well it applies to various domains of discourse, for example by seeing whether the truth-values it would assign to actual sentences matches our independent judgments about what those truth-values should be.

In fact, formal logical systems don't even specify which expressions in a natural language count as legitimate instances of a simple (i.e. noncompound) formula "*A*", hence, which natural language expressions are instances (or violations) of its theorems. Although logicians generally agree that the simple formulae of the systems should represent declarative sentences, there's considerable debate over which particular *kinds* of declarative sentences are suitable. Interestingly, many would say that as far as the purely formal laws of logic are concerned, "*A*" could stand even for sentences whose truth-value or meaning are uncertain, such as "unicorns are compassionate," "the square root of 4 is asleep," and "Zeus is insecure." But then it seems as if the uninterpreted formal law of noncontradiction is simply irrelevant to the cases under consideration. At best, those cases appear to challenge a semantic counterpart to the formal law, either

(NC_1): The conjunction of any sentence *p* and its denial not-*p* is false

or

(NC_2): No sentence can be both true and false

We needn't worry at the moment about whether (or to what extent) either of these versions of the law of noncontradiction is satisfactory. What matters now is that even if the law of noncontradiction turns out to be a viable principle of logical semantics, it may still have a variety of significant limitations. In fact, the utility of formal logical laws varies widely, and the interpretation of those laws has proven to be a notoriously tricky business. As with all formal systems, no system of logic determines in which domains (if any) its expressions may be successfully applied. Students of elementary logic learn quickly that there are differences between the logical connectives "and" and "or" and many instances of the words "and" and "or" in ordinary language. Similarly, not all "if . . . then . . . " sentences are adequately handled by the material conditional in standard systems of sentential logic, although that logical connective is undeniably useful in a great range of cases. Moreover, varieties of nonstandard and "modal" logics have been developed in attempts to represent types of discourse resistant to standard logical systems.

But even more relevantly, in most standard systems of logic, the formal law of noncontradiction, "not-(*A* and not-*A*)," is demonstrably equivalent to the *law of the excluded middle*, "*A* v ~*A*" (i.e. "*A* or not-*A*"). Like the formal law of noncontradiction, the law of the excluded middle concerns the form rather than the content of expressions. It takes any compound formula of the form "*A* or not-*A*" to be a theorem (or logical truth), no matter what formula "*A*" happens to be. Now the semantic sibling of that syntactic law is called the *law of bivalence*, which states that every sentence is either true or false. But the law of bivalence has faced numerous challenges throughout the history of logic (in fact, since the time of Aristotle). Many people have argued that it fails for sentences in the future tense and sentences whose singular terms refer to nonexistent objects. Moreover, some logicians consider these difficulties sufficiently profound to warrant the development of logical systems that retain the syntactic law of the excluded middle but reject the semantic law of bivalence (see, e.g., van Fraassen 1966, 1968, Thomason 1970). Now granted, these same logicians don't also reject the semantic version of the law of noncontradiction. Nevertheless, their reservations concerning bivalence should give us pause (especially in light of the caveats noted above regarding the limitations of formal systems generally). The debate over bivalence illustrates an important point, namely, that *the relative impregnability of a formal logical law may not be inherited by its semantic counterpart (i.e. one of its interpretations)*. But at the very best, it's only the semantic counterpart of non-contradiction that rests at the center of the Platonic/Freudian arguments for parts of the self. And in fact, as far as Plato's argument for the parts of the soul is concerned, the argument turns on an even more exotic interpretation of non-contradiction. See Braude (1995) for details.

But before we leave this topic, it's important to note that

(NC_1): The conjunction of any sentence *p* and its denial not-*p* is false

and

(NC_2): No sentence can be both true and false

are likewise problematical, and probably more so than most *JSE* readers appreciate. First of all, (NC_1) has numerous counterexamples familiar to students of logic and the philosophy of language. For example, it seems to fail for sentences such as the aforementioned "unicorns are compassionate," "the square root of 4 is asleep," and "Zeus is insecure," which seem to lack truth-value. Many people (but, notably, not all) would say that when a sentence lacks truth-value, the conjunction of that sentence and its denial also lacks truth-value.

The somewhat more common (NC_2) has similar problems. Most notoriously, perhaps, it fails for the self-referential sentence "this sentence is false," as well as for kindred expressions that don't seem even remotely suspicious inherently. For example, it fails for the innocent "the sentence on page 42 is false," when that sentence happens to be the only sentence on page 42. If these sentences have any truth-value at all, it seems as if they will be both true and false.

Furthermore, (NC_2) apparently fails for quite mundane present-tense sentences. For example, “Socrates is sitting” may be true at one time and false at another. Of course, one standard response to such cases would be to claim that the sentence “Socrates is sitting” contains an implicit reference to its time of production, so that it’s not really the same sentence that’s true at one time and false at another (i.e. those nonsimultaneous sentences would allegedly differ in meaning or express different propositions). For reasons too complex to be explored here, it seems to me that this particular maneuver creates more problems than it solves. Indeed, I’ve argued that the standard Aristotelian notion of contradictories (stated in terms of opposing truth-values) fails conspicuously for a tensed natural language, and that tensed contradictories can have the same truth-value (see Braude (1986) for a discussion of these issues). Although I recognize that my position is most definitely a minority view, I submit that there are additional serious reasons here for challenging the straightforward application of (NC_2) to a real natural language, hence, for questioning its inviolability outside of the highly artificial or overly simplified linguistic situations to which logical laws apply easily. In any case, this nest of issues illustrates again the kinds of concerns involved in evaluating the apparently uncertain status of what are considered to be our most cherished logical principles.

Please note that my point is not that the semantic law of noncontradiction is useless as a philosophical tool. And the moral is not simply that logical laws (like formal laws generally) may not hold in all domains (although that’s certainly true and relevant here). Rather, the point is also that logical laws hold *in real life* only for sentences we regard as *acceptable* (or *legitimate*) and *appropriate*, or as understood in certain ways rather than others. But these interpretations and classifications of linguistic entities are *practical* decisions, made as part of a much larger network of interrelated philosophical commitments. Accordingly, those decisions don’t stand or fall in isolation from others in various areas of philosophy and logic. In fact, they will continually be open for reassessment in light of apparent difficulties arising at numerous points in our overall system of commitments.

One further example reinforces that last point; it concerns what many regard as a fundamental principle about what philosophers typically call *numerical identity*. Many people have argued that it’s an indisputable rational principle that everything is identical with itself. However, it turns out that the concept of numerical identity is not so straightforward.

To see this, consider first the expression

(x)(x = x)

usually interpreted as “anything x is such that it’s identical to itself,” or more colloquially, “everything is self-identical.” The acceptability of this alleged law of identity is not something we can decide by considering that law alone, and it’s certainly not something that’s immune from debate among reasonable and well-informed persons. Regarded merely as a theorem of a formal system, it has no meaning at all; it’s nothing more than a sanctioned expression within a set of rules for manipulating symbols. But as an interpreted bit of formalism, it’s acceptable only with respect to situations in which we attempt to apply it. And perhaps more interesting, it’s *intelligible* only as part of a larger network of commitments. That is, what we mean by “everything is self-identical” depends in part on how we integrate that sentence with other principles or inferences we accept or reject.

To see this, consider whether we would accept as true the statement

(1) Zeus = Zeus

To many people, no doubt, that sentence seems as unproblematically true as the superficially similar

(2) Steve Braude = Steve Braude

However, in many systems of deductive logic containing the rule of Existential Generalization (EG), from the symbolization of (1), namely,

(1′) $z = z$

we can infer

(3) $(\exists x)\ x = z$

which we typically read as

(4) Zeus exists.

And of course, many people consider that result intolerable.

Not surprisingly, philosophers have entertained various ways of dealing with this situation. One would be to taxonomize different types of existence and interpret the rule of Existential Generalization as applying only to some of them (for example, prohibiting its application to cases of mythical or fictional existence). Another approach would be to get fussy about the concept of a *name*. We could decide that “Zeus” is not a genuine name and that genuine names (like "Steve Braude") pick out only real existent individuals, and not (say) mythical or fictional individuals. (Readers might be especially surprised to learn that some people have actually endorsed the view that we should not consider "Hamlet" or "Zeus" to be names if they pick out fictional or mythical characters.) In any case, both these approaches concede certain (but different) sorts of limitations to standard predicate logic and the way or extent it connects with ordinary discourse. Others prefer to tweak the logic directly, either syntactically or semantically. For example, some people simply reject the rule of Existential Generalization and endorse a so-called (existence) *free* logic. Alternatively, some retain EG but adopt a substitutional interpretation of the quantifiers "(x)" and "(∃x)", so that instead of reading (3) as

(3′) There is (or exists) some x such that x is identical with z (Zeus)

we read it as

(3″) Some substitution instance of "x = z" is true.

The latter, they would say, is acceptable and carries no existential commitments.[2]

Now the reader needn't understand all these options. The moral, however, should be clear enough. All these approaches raise concerns about what should be regarded as a *thing* in certain contexts. The statement "everything is self-identical" is not as clear or indisputable as one might think, and even more important in the present context, it's not simply true *no matter what*. Its truth (and indeed, meaning) turn on a number of other decisions as to which other principles or inferences are acceptable, and that whole package of decisions can be evaluated only on pragmatic grounds. Moreover, it's perfectly respectable to decide that some solutions to this conundrum are appropriate for some situations and that other solutions are appropriate for others. We're never constrained to select one solution as privileged or fundamental.

The reason why I've gone on at such length about these matters is that they should serve as a cautionary note to those who all too easily display intolerance and condescension in empirical (or political) debates. It's completely clear that reasonable and informed people can disagree (and have disagreed) over the nature and status—and, indeed, the *meaning*—of what we take to be fundamental logical laws. Of course, scientific (and political) debates rest not only on logical assumptions but on various empirical, methodological, and other conceptual assumptions as well. So presumably they're even more contentious and vulnerable to reasonable challenges than disputes over the foundations of logic. But then one would expect to find even more room there for reasonable and informed disagreement. Ideally, then, one would expect participants in empirical debates to be particularly open-minded, tolerant, and respectful of opposing views. So the next time you find yourself tempted to dismiss or deride with a disdainful flourish someone with whom you disagree over a matter of science (or politics), I encourage you to remember how venerable and substantive are the serious debates over the very foundations of our conceptual framework.

Notes

1 I'm indebted to Aune (1970) for much of what follows.

2 For more on free logic, see Lambert (2004), Morscher & Hieke (2001), and van Fraassen (1966). And for an accessible review of many of the issues concerning nonexistent objects, see Reicher (2016).

—Stephen E. Braude

References Cited

Aune, B. (1970). *Rationalism, Empiricism, and Pragmatism: An Introduction*. New York: Random House. [Reprinted: Ridgeview Publishing, 2003]

Braude, S. E. (1986). You can say that again. *Philosophic Exchange, 17*:59–78.

Braude, S. E. (1995). *First Person Plural: Multiple Personality and the Philosophy of Mind* (revised edition). Lanham, MD: Rowman & Littlefield.

Lambert, K. (2004). *Free Logic: Selected Essays*. Cambridge: Cambridge University Press.

Morscher, E., & Hieke, A. (Editors) (2001). *New Essays in Free Logic: In Honour of Karel Lambert*. Dordrecht: Kluwer Academic Publishers.

Reicher, M. (2016). Nonexistent Objects. In *The Stanford Encyclopedia of Philosophy* (Winter 2016) edited by E. N. Zalta. https://plato.stanford.edu/archives/win2016/entries/nonexistent-objects/

Thomason, R. H. (1970). Indeterminist time and truth-value gaps. *Theoria, 36*:264–281.

van Fraassen, B. C. (1966). Singular terms, truth-value gaps, and free logic. *Journal of Philosophy, 63*:481–495.

van Fraassen, B. C. (1968). Presupposition, implication, and self-reference. *Journal of Philosophy, 65*:136–152.

Wilkes, K. V. (1988). *Real People: Personal Identity without Thought Experiments*. Oxford: Oxford University Press.