

dangerous is a reason to believe that it is, *and* a reason to desire to escape. As a result, if we accept a perceptual or neo-judgementalist account of the emotions we can avoid the problem raised in the previous paragraph, since now experiences of value are emotional construals rather than desires. We can, in addition, accommodate Oddie's central distinction between experiences of value and evaluative judgements, maintain the connections between evaluations and motivations (since there are obvious connections between emotions and motivations), and avoid metaphysical worries (since emotions are as familiar, if not as mundane, as desires). As a result, Oddie might indeed find it profitable to replace talk of desires with talk of emotions. In so doing, he might secure a better foundation upon which to lay the arguments against idealism, naturalism, and transcendentalism which constitute the rest of this impressive contribution to metaethics.

*University of Glasgow*  
69, Oakfield Avenue  
Glasgow, G12 8QQ  
Scotland, U.K.  
doi:10.1093/mind/fzm193

MICHAEL S. BRADY

*The Old New Logic: Essays on the Philosophy of Fred Sommers*, edited by David Oderberg. Cambridge, MA: MIT Press, 2005. Pp. xii + 242. P/b \$35.00/£22.95.

The work of Fred Sommers now spans more than 50 years. It contains contributions to many issues in the philosophy of language and philosophical logic, some of them highly original and of exceptional significance. A volume of essays on his philosophy was therefore only natural.

After a short Preface by the editor, David Oderberg, and a brief Foreword by the late P. F. Strawson, the book starts with an 'Intellectual Autobiography' by Sommers. This is in fact an introduction to his philosophy, presented in the order of its development and interspersed with a few autobiographical notes. It is followed by another introduction, 'Trees, Terms and Truth: The Philosophy of Fred Sommers', by George Englebretsen. Despite partial overlap, Englebretsen's introduction adds much material to what has already been mentioned in the opening essay, and also explores unobvious connections between Sommers's major contributions. These two essays together provide an excellent introduction to Sommers's work for those unfamiliar with it, and a helpful overview for those acquainted with some of his earlier writings.

The book then proceeds with eight essays, by E. J. Lowe, Frank C. Keil, Alan Berger, Patrick Suppes, William Purdy, Steven Lindell, Aris Noah, and David Oderberg. Its last essay is again by Sommers, 'Comments and Replies' on the previous nine essays; these are always helpful and perceptive. The book also contains a list of Sommers's works.

Not many philosophers' work has been found relevant not only to philosophy but also to mathematical logic, linguistics, psychology, and computer science. The variety of essays in this volume demonstrates that Sommers is one of these few. The essays, moreover, deliver more than they promise: these are not only essays on Sommers's philosophy, but they contain contributions to additional issues as well.

Keil, for instance, starts off with the influence of Sommers's category theory on work in empirical psychology. He then continues by describing the similar influence the work of Kripke, Putnam, and others on kinds, essences, and division of linguistic labor has had. He concludes with interesting remarks on the 'dramatic influences' had by philosophy of language, logic, metaphysics, and other fields, where no explicit psychological claims have been made, on empirical psychological research. Lindell analyses 'scalability requirements for models of information by examining simple physical restrictions on storing arbitrarily large amounts of data in memory' (p. 166). Oderberg supplies a learned and meticulous analysis of Quine's ideas of reference, and discusses possible ontological implications of these ideas. Others discuss anaphora (Berger and Purdy), prepositional phrases (Suppes), the relation of logic to ontology (Lowe and, as just mentioned, Oderberg), and more.

It is of course impossible to discuss here in any detail anything but a fraction of what this rich book contains. I shall limit myself to a discussion of two of Sommers's main contributions: Category Theory and Term Logic. For lack of space I shall not discuss either his Theory of Truth or any of the essays that further develop his ideas or try to apply them.

Starting with a paper published in *Mind* back in 1959, Sommers, inspired by Ryle, has developed a theory of predicability. How is it, he asked, that we do not produce nonsense like 'Saturday is in bed'? How do we know, that is, which term is meaningfully predicable of which? His reply was that our concepts are arranged on a category tree, which represents the meaningful predicability relations. To each term there corresponds its contrary: 'colourless' to 'coloured', 'nonred' to 'red', and so on. Each such pair is designated by two slashes, a kind of absolute value; thus, /coloured/ represents the disjunctive term 'coloured-or-colourless'. The central claim now, which makes it possible to arrange all concepts in a category tree, is that '[i]f some /X/ is /Y/ then either every /X/ is /Y/ or every /Y/ is /X/' (p. 5). If some coloured thing, say, weighs five pounds, then either all things that are either coloured or colourless either weigh five pounds or do not weigh five pounds, or the other way round. Since we cannot meaningfully predicate either 'weighs five pounds' or its contrary of a red glow, all things that /weigh five pounds/ are /red/, and /red/ is higher on the category tree.

This yields an elegant upside-down tree structure to our terms, in which an M-structure,  $\wedge$ , is forbidden; otherwise the two upper categories would be predicable together of some things (the lower middle node), but each would be predicable of some thing of which the other is not (the lower left and right

nodes). If the M-structure apparently appears, it often indicates ambiguity. Since skies are /grey/ but not /sharp/, while knives are /sharp/ and /grey/, /grey/ is higher than /sharp/ on the category tree. But then, musical notes are /sharp/ but not /grey/. It follows that they are not /sharp/ in the same sense that skies and knives are.

Despite its initial appeal, this apparent predicability structure faces some difficulties. For instance, it is based on the assumption that each term has a contrary, and on a distinction between negating a term and affirming its contrary (Englebretsen, p. 32). But while 'coloured' indeed has 'colourless' as a contrary, 'nonred' is dubious as a candidate contrary for 'red'. Moreover, 'in the house' is supposed to have 'not in the house' as its contrary (ibid. p. 26); but language does not distinguish between negating the former and affirming the latter. And coming to that, how could we explain a thing's being nonred but as its not being red? So the whole edifice might be grounded on an over-generalization from a few valid cases.

Sommers's claim that our mastery of the tree structure explains why we do not produce nonsensical sentences like 'The accident rejected the invitation' seems unconvincing. According to him, I take it, since neither /accident/ nor /reject/ is higher on the category tree, which is somehow encoded in our mind, the sentence is ruled out despite its grammaticality. But it rather seems to me that we do not produce such sentences because we understand that they make no sense. The reason we do not produce them is semantic, and not formal. What would it *mean* for an accident to reject an invitation in the same sense that Jane may? Sommers assumes here, without justification, that the mind is, so to say, a syntactical engine, producing acceptable sentences on the basis of structural properties of their elements. But this is only very partly true: we generally produce only sentences whose meaning is clear to us, and therefore grammatical nonsense is generally avoided.

A second subject on which Sommers has worked is the revival of Aristotelian logic, in a modified and strengthened form, which he calls Term Functor Logic (abbreviated TFL). His main publication here is his magnum opus, *The Logic of Natural Language* (OUP 1982). Both Sommers and Englebretsen present some of TFL's basic ideas in their essays, and other ideas come up in other contributions to this volume. I can only scratch the surface of this mine of ideas and insights here.

Sommers revives the Aristotelian subject–predicate structure of sentences, including quantified ones. First, not only singular statements, but also general ones are predications. This is already in contrast to the Predicate Calculus (PC), according to which, in 'All *S* are *P*', '*P*' is not predicated of '*S*'; but both rather function as predicates, the logical form of that sentence being 'For every *x*, if *x* is an *S* then it is a *P*'. Secondly, 'the two parties tied in predication are not a noun-phrase subject and a verb-phrase predicate but two syntactically interchangeable terms' (p. 10). That is, in 'Every philosopher is mortal' the subject-term is 'philosopher', and not 'every philosopher'; and the predicate is 'mortal', and not 'is

mortal'. Moreover, 'philosopher' and 'mortal' can both function as either subject-term (or argument) or predicate. This is a significant rejection of Fregean ideas, according to which an argument cannot function as a predicate or function-term, and vice versa: these syntactic categories represent an unbridgeable distinction between object and concept. And indeed, Sommers sees in that distinction an artifact of Frege's logical syntax, justly absent from Aristotelian logic. Thirdly, predication is done by means of predicative expressions, 'every ... is' in our example. This is again in marked contrast to Fregean logic, in which no logical tie is needed for predication; its sentences' basic form is *Pa*, in which the predicate latches directly onto the argument. For that reason Frege had to shove the affirmative copula into the logical predicate, and to break the negative one into sentence negation and predicate constituent. I find Sommers's Aristotelian semantics much more plausible than Frege's; I am not acquainted with any compelling argument for Frege's unintuitive analysis, nor have I seen any PC advocate trying to defend his logic against Sommers's criticisms.

Sommers built a powerful deductive system on the basis of his analysis. He identified the particular quantifier, affirmative copula and conjunction as plus-words, and the universal quantifier, negative copula and implication as minus-words. Deduction then turns into simple algebra. For instance, 'Every S is M' and 'Every M is P' are formalized ' $-S+M$ ' and ' $-M+P$ '; add them and you get ' $-S+P$ ', that is, 'Every S is P'! (The Medieval *dictum de omni* supplies some constraints on admissible inferences, which I won't discuss here.) By contrast to Aristotle, Sommers managed to extend his system to multiply-quantified sentences, such as 'Some boy envies every astronaut', and to apply it to propositional logic as well. He thus obtained a deductive system which is not less powerful than the first order predicate calculus, and far more elegant than any system applicable to the same range of natural language sentences (including, I should admit, the one I have recently developed). This is arguably one of the greatest achievements of formal logic in the twentieth century.

Still, I think Sommers's logic cannot enjoy the status to which it aspires, namely, being *the* logic of natural language (nor can the PC). Consider first, for instance, Sommers's treatment of proper names. In order to incorporate them into his calculus, he takes sentences like 'Socrates is an Athenian' to be implicitly quantified, equivalent to both 'Every Socrates is an Athenian' and to 'Some Socrates is an Athenian'. 'Since either quantity may be assigned, ordinary language does not specify a quantity for singular statements' (p. 13). But I think this is unacceptable. If we think we understand 'Every Socrates is an Athenian', we think so because we take 'Socrates' to be something like a kind term, and *not* a proper name. And it is not that ordinary language specifies no quantity because *any* would do: 'three' and 'many' would not, if there is only one Socrates. Ordinary language does not specify a quantity since it makes no sense to quantify when reference is done by means of a proper name. If one were trying to build an artificial system, roughly equivalent in its expressive power to a fragment of natural language, then quantifying over proper names

might be acceptable. But that is *not* what Sommers is trying to do: he is looking for ‘the logic we use in everyday reasoning’ (p. 9). In his treatment of singular sentences he failed to achieve that goal, or to give an adequate account of the semantics of singular sentences.

Secondly, his very project is dubious. Here again Sommers assumes with no argument that when we reason, our mind is a syntactic engine: our reasoning is formal. The complexity of the PC derivations makes it then improbable that we use anything like the PC in our everyday reckoning, while Sommers’s simpler calculus is a far better candidate for ‘cognitive adequacy’ (p. 9). But do we pass from premises to conclusion in these reckonings on the basis of formal structure, or because we *understand* what the premises and conclusion mean, and we therefore know that what the conclusion says has already been said by the premises? It has also been shown (Cosmides) that people’s ability to carry out deductive derivations is influenced by subject matter, their success in formally equivalent syllogisms being dependent on what the corresponding statements say. If that is so, then formal logic should not aim at describing how we reason, but rather systematize and reveal the interconnections between formally valid arguments.

Thirdly, although Aristotle discussed the logical relations between sentences containing either of two quantifiers, ‘all’ and ‘some’, natural language contains, literally, infinitely more quantifiers that belong to the same syntactic family, one-place determiners: ‘seven’, ‘at least two’, ‘many’, ‘most’, ‘infinitely many’, and so on. If a formal system aspires to account for the meaning-structure of natural language, it should explain by means of the same principles the contribution of all these quantifiers to what is said. Frege’s predicate logic, although usually explicitly containing only the quantifiers ‘all’ and ‘there is’ (is ‘there is’ a quantifier at all?), can also incorporate the quantifiers ‘seven’, ‘at least two’ and ‘infinitely many’ of our list, but not ‘many’ and ‘most’. This has been acknowledged as a drawback, and consequently philosophers and linguists today prefer generalized quantifiers as their model of natural language quantifiers, since generalized quantifiers do incorporate these additional two quantifiers. Still, this model has its own difficulties, for it encompasses *too many* quantifiers, ‘more’ being one such example. So there is a real issue here.

Sommers, however, does not try to apply his analysis of the natural language quantifiers ‘all’ and ‘some’ to any other quantifier, apart from ‘no’. His deductive system has indeed been extended by Murphree to cover some numerical quantifiers as well (‘Numerical Term Logic’, *Notre Dame Journal of Formal Logic*, 39, 1998, pp. 346–62), but neither Sommers nor anyone else has tried, to the best of my knowledge, to account by means of Term Logic for the range of quantifiers actually found in natural language. Worse, I cannot see how Sommers’s plus–minus analysis *could* be applied to additional quantifiers. If ‘all’ is a minus-word, like ‘if’ and the negative copula, while ‘some’ is a corresponding plus-word, what can be said of the other quantifiers listed above, ‘most’ for instance? The whole algebraic plus–minus system seems inapplicable to them.

This system suddenly seems as a brilliant computational device, which does not help us in understanding the contribution of different parts of speech to sentence meaning. The symbolic affinity between ‘all’ and ‘isn’t’—both being minus-words—and their contrast with ‘some’ and ‘is’ (plus-words), does not disclose any significant semantic fact about them.

For these and similar reasons I think that Sommers’s logic cannot be considered *the* logic of natural language. It does give us a different point of view on natural language, superior in many respects to that supplied by Frege’s logic. Apart from the several advantages mentioned above it also uses no variables, it doesn’t multiply the meanings of the copula, and more. On the other hand, I have just mentioned a disadvantage it has relative to the predicate calculus, primarily in its generalized quantifiers version. If one wishes to understand the semantics of natural language, one better study *both* approaches. This is sadly not the case. To give just one glaring example, in a recently published 528-page book, *Quantifiers in Language and Logic*, by Peters and Westerståhl (OUP, 2006), Sommers’s work is not mentioned even once. This one-sided approach has the obvious drawback that semantic features peculiar to the PC are unreflectively assumed to belong to natural language as well; it is at most maintained that they are just not transparent in it the way they are in the PC. Is the ‘is’ of identity different from that of predication? It is in the PC, it is not in Sommers’s system. And how is it in natural language? Do we have any reason to prefer one system to the other? In fact I think we do have good reasons to prefer Sommers’s, as he has shown already in an article of 1969 (‘Do We Need Identity’, *Journal of Philosophy*, 66, pp. 499–504; see in this volume Lowe, pp. 49–52). But be that as it may, the main problem is that due to their ignorance of Sommers’s work, the very possibility that identity statements are not relations seldom crosses philosophers or linguists’ minds.

Why Sommers’s work is not better known is hard to say. Part of the reason, however, might be that Sommers’ 469-page tome, *The Logic of Natural Language*, is something one would read only after one has already been convinced of the significance of the approach. And although briefer surveys and introductions by Sommers and Englebretsen exist, they may not have been sufficiently accessible. This difficulty has now been removed, with the publication of *The Old New Logic*. The book’s introductory chapters should be recommended reading to anyone interested in the semantics and logic of natural language. And anyone working on issues discussed in its later chapters would do well to consult them too.

*Philosophy Department*  
*Central European University*  
*Nádor u. 9*  
*1051 Budapest*  
*Hungary*  
 doi:10.1093/mind/fzm197

HANOCH BEN-YAMI