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Book Review

Stewart Shapiro. *Vagueness in Context*. The Clarendon Press, Oxford, 2008. x + 226 pages.

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Stewart Shapiro is Professor of Philosophy at The Ohio State University and at the University of St Andrews. The question of the logic of vague concepts has occupied a central position in the philosophical research at these institutions. The ideas for his latest book *Vagueness in Context* arose from discussions and conversations in these two rich intellectual environments. Shapiro does not have a long track record of journal publications on vagueness. But he (determinately) is one of the most prominent philosophical logicians to date. So when he articulates his own view on the matter, one is well advised to listen. Even if one ends up not agreeing, one will be sure to learn.

Shapiro carves out a new theory of vagueness. This theory is developed in detail and defended against possible objections. In a nutshell, Shapiro's theory is a combination of contextualism and supervaluationism. The first half of the book contains the heart of the proposal. It contains a long chapter describing the philosophical position that is advocated and the guiding ideas behind it (Chapter 1) and a formal elaboration of the theory (Chapters 3 and 4). In between, we find a chapter on adequacy conditions for a formal theory of vagueness (Chapter 2). The second part of the book contains refinements and extensions of the theory and connections with related fields (Chapters 5, 6, and 7).

In this review, I will summarize the main tenets of Shapiro's theory and critically discuss them. Unlike [1], which concentrates on philosophical aspects of Shapiro's theory, I will also discuss aspects of the technical part of his proposal. I will not discuss the final chapters of the book, which deal with the question whether all vagueness is semantic vagueness or whether there exist also vague properties and relations or even vague objects in the world.

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According to Shapiro, vague predicates are response dependent, at least in their borderline regions. The extension of vague predicates is determined by the competent speakers of the language to which they belong; at least in the borderline regions, nature does not have a decisive role to play. This is in agreement with the so-called thesis of *open texture*, which Shapiro attributes to Waismann. It says that speakers can leave the extension and anti-extension of vague predicates partly undecided. They can fail to qualify a person, say, as being either bald or not bald.

A next ingredient of Shapiro's theory is a particular form of contextualism. Shapiro holds that David Lewis's notion of conversational score is applicable to the semantics of vague predicates. As long as they stay within the bounds of the semantical rules and respect the nonlinguistic phenomena, speakers are in a conversational situation free to *decide* to classify a certain person as bald. The semantical rules of English determine that some persons cannot correctly be classified as bald. But lots of people are left unclassified as to their baldness status by nature and the semantical rules combined. Speakers in a conversational situation may legitimately and correctly classify some such people as bald and others as not bald. Thus, they put it on the conversational score that person a is bald and that person b is not bald, and then their saying makes it so. Later in the conversation, some of these judgments may be removed from the conversational score.

Certain principles should be respected in such conversational practices. One rule is *consistency*. A sentence and its negation should not both appear on the score sheet at the same time. To be sure, this requirement may be violated in practice. Participants in a conversation may forget about some item being on a long score sheet, and in the heat of a debate illegitimately add its negation to the score as well. But, ideally, the norm of consistency should be maintained. (Thus Shapiro veers away from paraconsistent approaches to the logic of vagueness.)

Another principle that should be respected, at least most of the time, and which occupies a central place in Shapiro's account, is the *principle of tolerance*:

> Suppose a predicate P is tolerant, and that two objects a, a' in the field of P differ only marginally in the relevant respect (on which P is tolerant). Then if one competently judges a to have P, then she cannot judge a' not to have P.

This version of the principle of tolerance needs to be distinguished from the stronger version that reads just like it except that it ends with " . . . then she must judge a' to have P." This stronger version leads straight to paradox and must therefore be shied away from.

Shapiro's account of truth for sentences containing vague predicates borrows ideas from supervaluationism. According the supervaluationist account of vagueness, truth amounts to *super-truth*: a sentence is true if it is true given any admissible complete sharpening of the vague predicates involved. But Shapiro's model for truth for sentences containing vague predicates is different from this. It has to be, because the principle of tolerance entails that *total* sharpenings of vague predicates such as 'bald' are inadmissible in a conversation. On Shapiro's account a sentence is true if for every admissible way of sharpening the vague concepts involved, there is a further admissible sharpening of the concepts involved which makes the sentence come out true. In other words, a sentence is true if it is bound to come out true if the

conversation is indefinitely extended in any admissible way (by putting ever more decisions on the conversational score).

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Unlike many other works on vagueness, Shapiro's book contains a rich and detailed formal theory. In the first place, Shapiro describes interesting classes of models for languages containing vague predicates and relational expressions. In this sense, Shapiro provides a semantic theory of vagueness. But he also gives inference rules for languages containing vague expressions.

One basic aim of Shapiro's theory is to articulate a formal notion of truth for sentences containing vague expressions. This he does in the model theoretic way. But first he discusses the desiderata that a formal semantics for vague predicates should satisfy. An important distinction that is made at this juncture is that between *artifacts* and *representors* in a model theoretic semantics. Roughly, artifacts of a model are components of the model that have no counterpart in the language user's understanding of the terms involved: they merely serve an instrumental purpose. Representors are components of a model that fairly accurately represent components in language users' understanding of the words involved. A desideratum for a model theory for vague terms is to produce classes of models which contain as few artifacts as possible. In this context, the use by the supervaluationist of total sharpenings of partial models is (given the principle of tolerance) an artifact of their treatment of vagueness. The supervaluationist's model theory may (or may not) assign by and large the correct truth values to sentences containing vague expressions. But if a model theory could be developed which does not make use of total sharpenings, then that would (all other things being equal) be preferable. In this sense, even aside from taking contextualist considerations on board, Shapiro's model theory is a clear improvement on the supervaluationist model theory, for it does not make use of total sharpenings.

Shapiro's formal theory is based on partial models in the normal sense of the word. I will not rehearse the details here, except to mention that truth in a partial model is evaluated in the Strong Kleene way. But this is just an auxiliary notion of truth, so to speak. The real notion of truth for vague sentences is defined in terms of the notion of a *frame*. A frame $\langle \mathcal{M}, N, \leq \rangle$ consists of a collection $\mathcal{M}$ of partial models, which are partially ordered by an accessibility relation $\leq$, with the partial model N being the root of $\mathcal{M}$. The models of $\mathcal{M}$ correspond to conversationally admissible sharpenings of the root model N. As one moves along the accessibility relation, one entertains ways in which new items could be placed on the conversational score. Thus the salient contextualist factors are represented in the model theory.

Of course, not all frames are admissible. The models in frames have to satisfy certain constraints, of which the principle of tolerance occupies place of pride.

According to the supervaluationist, truth amounts to super-truth. Shapiro's analogue or model of truth amounts to super-truth with a twist. More precisely, truth amounts to what is called *forcing* at the root of the frame. A sentence φ is forced at the root N of the frame $\langle \mathcal{M}, N, \leq \rangle$ if for every model M in $\mathcal{M}$, there is a model M' accessible from M such that φ is true at M'.

But this is only part of Shapiro's formal story. Shapiro aims to faithfully represent how language users reason with vague predicates. One of the claims is that certain constraints on the models of vagueness, such as the principle of tolerance and sorites

premises, are used by language users when they reason with vague predicates. This means that such principles must be formulated in the object language. Shapiro shows that the ordinary logical connectives do not have sufficient expressive power to do this. Thus he introduces new connectives: new (semi-)intuitionist conditional operators, new negation operators, new quantifiers. With the aid of these new connectives, the desired expressive power is obtained.

Shapiro then goes on to tackle the problem of higher-order vagueness. On the straightforward way of defining the notion of *determinate truth*, this notion ends up being sharp. But this does not square well with our pretheoretical understanding of vagueness, under which there is no sharp distinction between, say, the determinately bald persons and the borderline bald persons. What to say? Shapiro's treatment of higher-order vagueness is more tentative than his treatment of first-order vagueness: he contents himself with exploring the various options. Indeed, he leaves it open whether higher-order vagueness exists at all. But on the strategy in which higher-order vagueness is taken as a real phenomenon, the model theoretic treatment becomes more complicated. I shall not go into details here. I only note that the notion of truth is now no longer defined in terms of frames, but in terms of collections of frames.

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Now I turn to the evaluation of Shapiro's proposal. First I make some global remarks; then I discuss a few more specific issues.

Overall, this surely is a most valuable contribution to the philosophical theory of vagueness. Many a philosopher has felt the attraction of both contextualist approaches to vagueness (Graff, Raffman) and of supervaluational approaches (Fine, Keefe). Shapiro gives us a theory which reconciles contextualism with supervaluationism in a seamless way, thus combining their respective forces, as it were.

It is not clear to me, however, that all problems of vagueness can be resolved by however cleverly combining known stratagems, such as contextualism and supervaluationism. In particular, the problem of higher-order vagueness does not appear to be solved in an absolutely satisfactory way. Even if one moves to classes of frames as the tool for defining a notion of truth for sentences containing vague expressions, the partial models involved all distinguish sharply between determinately bald people (for instance) and borderline bald people. Thus, it would seem that the partial models out of which (classes of) frames are built should be labeled as artifacts of the model theory rather than as representors. It is not easy to see how this can be completely avoided. As Shapiro himself says, models are mathematical entities, and mathematical entities are always sharp—unless, of course, one moves to nonstandard mathematical entities (intuitionistic mathematical objects, for instance). All this might motivate us to reconsider Shapiro's judgment that traditional supervaluationism won't do because it has total sharpenings as ingredients (which are clearly artifacts). Hung for a sheep, hung for a lamb, one might say. Nevertheless, the point remains that Shapiro manages to eliminate one glaring artifact from the model theories of languages containing vague expressions that are based on some form of partial logic.

In his discussion of the principle of tolerance, Shapiro repeatedly discusses forced march scenarios, which are represented as thought experiments of the following kind. Such a series starts with a person a_0 with no hair on his scalp, proceeding by small

incremental steps to hairier persons, and ending with a person a_{2000} who is very hairy indeed. As a member of the series appears, a fixed committee of competent users of English is asked whether the person in front of them is bald. The committee is only allowed to answer yes or no, and is compelled to arrive at unanimous judgment. It is predicted that at some point in the series, say at a_{1200}, the answer switches from yes to no. Then the series is run in reverse order, and the same question is posed each time to the committee. It is predicted that typically at some other point, say at a_{800}, the answer will switch from no to yes. Shapiro's theory is motivated by the results of such thought experiments. He concedes that how such a scenario would evolve is ultimately an empirical matter. But he does not undertake or discuss actual experiments to check if real life responses are in line with what he expects the outcomes to be. Perhaps it is a small matter, but I think that to the extent that we are interested in semantics of natural language, such experiments should be carefully carried out (in close collaboration with experimental psychologists). Maybe the results will be entirely unsurprising. But we can't be sure until we run the experiments. In private conversation, Shapiro has informed me that some empirical research on sorites scenarios for color terms has been carried out at The Ohio State University. It would be nice if research of this kind could be explicitly brought to bear on thought experiments for forced march scenarios.

I have argued above that the technical part of Shapiro's theory is impressive. Nevertheless, there are lots of questions here that are not answered in Shapiro's book but which are nevertheless worth investigating. Shapiro does not say whether there exist complete axiomatizations (of the form $\Gamma \vdash_T \varphi \Leftrightarrow \Gamma \models_{\mathfrak{M}} \varphi$, where T is a deductive system and $\mathfrak{M}$ is a class of models) of, say, the propositional fragment of the interpreted formal languages that he is considering. Given the fact that a supervaluation idea is present in the model theory, one should perhaps not expect complete axiomatizations. But then it would be interesting to know what the maximal complexity of the set of conclusions from a recursive set of premises would be. And it would then also be worthwhile to look for natural partial axiomatizations of the consequence notions. In sum, on the proof theoretic side of the technical proposal there remains work to be done.

One final point. As mentioned before, Shapiro introduces various new conditional operators. And he advances the claim that these conditionals model some of the logical aspects of natural language conditionals that arise when we are reasoning with vague predicates. The conditionals that he introduces are broadly speaking of the possible worlds kind, that is, of the same ilk as C. I. Lewis's strict implication. But in contemporary research on indicative conditionals (as opposed to contemporary research about counterfactuals), a possible world approach is currently out of favor. Instead, a (temporary?) consensus seems to be emerging that the right way to model indicative conditionals must be probabilistic in nature. But in Shapiro's book, probabilistic theories of conditionals are not even mentioned. This is disappointing. Given the importance that Shapiro attaches to conditionals for his theory of vagueness, there should have been more engagement with contemporary literature on conditionals in natural languages. Similar remarks could be made for Shapiro's discussions of negation, disjunction, and existential quantification.

Some of the above remarks are of a methodological nature. They lead me to the following overall appraisal. When it comes to attention to methodology in logical modeling, Shapiro is second to none in the business. When it comes to attention

to interdisciplinary, or even inter-subject connections, this book leaves room for improvement. Surely to explore the connections between Shapiro's theory of vagueness and contemporary pragma-linguistics is a project that is well worth pursuing. But, to reiterate, Shapiro's theory of vagueness is one of the strongest on the table at the moment. Every scholar of vagueness ought to know it and engage with it.

References

[1] Eklund, M., *Book Review: Vagueness in Context, by Stewart Shapiro*, Notre Dame Philosophical Reviews. 2006. 221

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