

## **Kees van Deemter: Not Exactly: In Praise of Vagueness**

**Oxford University Press, Oxford, 2010, xvi+341, \$29.95,  
ISBN: 0-199-5459-01**

**Patrick Allo**

© Springer Science+Business Media B.V. 2011

To a first approximation, the sorites paradox, or paradox of the heap, proceeds thus. Consider  $n + 1$  grains of sand, and let  $n$  be large enough so that  $n + 1$  grains of sand clearly and unambiguously make a heap. Consider, then, the following principle: if  $n + 1$  grains of sand make a heap, then surely  $n$  grains also make a heap. Putting both seemingly acceptable assumptions together, we may conclude that  $n$  grains make a heap. Yet, if we can once reason along these lines, we can equally well apply this reasoning  $n$  times, and thus conclude that even a single grain of sand makes a heap. This last conclusion surely can't be true, yet we arrived at it by (seemingly) correct reasoning from (apparently) true premises. An obviously false or at least clearly unacceptable conclusion that follows from otherwise intuitively true premises is all we need to have a genuine paradox.

One of the things van Deemter does is to defend a specific solution to the sorites paradox. However, this book does much more than that, and differs in that respect from the literature on vagueness philosophical logicians are accustomed to. In fact, apart from a brief description of the sorites paradox in the introduction, we have to wait until Chapters 7 and 8 for a discussion of paradox as we know it.

Already in the introduction van Deemter makes clear what his real target is; namely, the concept of *False Clarity*. The underlying theme of this book is the clash between vague expressions and concepts, and our tendency to talk and think about these concepts as if they were crisp. By these lights, the sorites paradox is nothing more than one particularly telling symptom of a broader phenomenon (though, in view of the more mundane examples van Deemter reviews, perhaps also a misleadingly artificial one).

While most treatments of the phenomenon of vagueness traditionally focus on the semantics of vague predicates, the present book sets out to answer at least two more

---

P. Allo (✉)

Postdoctoral Fellow of the Research Foundation (FWO) Centre for Logic and Philosophy of Science, Vrije Universiteit Brussel, Pleinlaan 2, 1050 Brussels, Belgium  
e-mail: patrick.allo@vub.ac.be

questions. A first question concerns the domains of inquiry and discourse where we might be confronted with vagueness, and where this phenomenon often seems unavoidable. A second question concerns the sheer presence of vague expressions in natural language. Witness the apparent tension between, on the one hand, the ubiquity of vague notions, and, on the other hand, our own enduring bias in favour of crisp expressions which is surely as paradoxical as the sorites itself.

The book is structured in three main parts. A first part is titled “Vagueness, where one least expects it,” and contains an extensive overview of areas and domains where some of the available information is vague. It starts with two chapters on how vagueness shows up in the concepts used in scientific theories. In the first of these chapters (Chapter 2) the concept of a species is used to illustrate this fact with a wonderful example (adapted from Dawkins) of how we get a clash between (a) the use of “interbreeding” as a criterion for deciding which animals belong to the same species; (b) the intuitively valid idea that a species should form an equivalence class; and (c) the failure of transitivity of the *interbreeding* relation with *ring species* like the *Ensatina salamander*. In Chapter 3 the use of measurements and the related issue of how we communicate quantitative information is taken up. Here, van Deemter illustrates his point with an overview of the history of the metre, as well as with a discussion of how we measure, quantify and set precise thresholds for inherently vague properties like obesity, poverty, and intelligence. The next chapter picks up a standard theme in the discussion of ontological vagueness and the existence of vague objects, namely the topic of vague identity and gradual change. Here too, the reader gets a number of different examples that involve physical (historical racing cars, books, persons), as well as more abstract entities (languages).

The fifth chapter concludes the first part of the book, and is in my opinion also the most stimulating one. It deals with how vagueness might, even when it falls outside the realm of measurements, creep into talk about numbers and mathematics. Surely, this is vagueness where one wouldn’t expect it at all. This includes (1) a discussion of how the use of the vague notion of an *acceptable number* by the strict finitist leads, via a sorites-like argument, to the finitistically unacceptable notion of potential infinity; (2) a discussion of how we talk about numbers, which leads van Deemter to a further digression on how talk about quantities shows up in natural language; (3) a discussion of how complexity theory introduces disjoint and precise complexity classes to compare the efficiency of computer programs; and (4) a critical discussion of how the gradable concept of statistical significance (which is a measure of the rashness of a generalisation) is often treated as a crisp property (a generalisation is either said to be significant, or not significant). This last topic is quite typical for the concerns van Deemter raises at several points in the book, as it deals with how easily one can mislead an audience by claiming that something or someone is *P* (e.g. significant, obese, poor) without disclosing crucial details like the relevant threshold. This, van Deemter suggests, is false clarity at its worst!

The second part of the book deals with theories of vagueness, and concerns topics and issues one expects to find in a book on vagueness. Chapter 6 is perhaps an exception, for here we also get a succinct overview of the work of Chomsky and Montague with respect to how we can look at natural language from a computational perspective, a description of the role of language corpora in

contemporary linguistics, and then a discussion of topics in linguistics that are more or less closely related to the phenomenon of vagueness.

The problems posed by vagueness essentially bear on how we should reason about and communicate vague information. As previously suggested, the sorites paradox makes the problems we face when reasoning with vague information rather acute. In Chapter 7, van Deemter gives a clear diagnosis of this problem by reducing it to a conflict between three intuitively valid principles: (1) the *law of admissibility* (if  $x$  is not short, and  $y$  is taller than  $x$ , then  $y$  isn't short either), (2) the *law of non-transitivity* (transitivity fails for relations like approximate equality, and indistinguishability), and (3) the *law of tolerance* (if  $P$  is a vague predicate, and  $x$  is in the relevant respects indistinguishable from  $y$ , then  $y$  is  $P$  iff  $x$  is  $P$ ).

The ensuing discussion of how the clash between these three laws can be resolved contains a nice overview of a number of widely recognised theories of vagueness. First, it is shown how classical orthodoxy (the dogmatic adherence to classical logic) has motivated a position called epistemicism (vagueness follows from ignorance; not from the presence of genuine borderline cases). Here, as well as at the start of Chapter 8, van Deemter reveals his willingness to depart from the canons of classical logic. He writes "Logic is now seen more as an adaptable tool: confronted with a task, you may design a logic . . ." (p. 155). While this position should have been standard for many years, it unfortunately remains controversial in some (rather influential) parts of the philosophical community. It is thus more than welcome to see this "engineering" view of logic<sup>1</sup> defended in a book that makes a topic with clear philosophical ramifications accessible to a broader audience.

Throughout the remainder of Chapter 8, van Deemter reviews what he considers the more conservative ways of revising classical logic. This includes the by now standard combination of partial logic with supervaluations (including a very clear description of the notion of a *penumbral connection*), the context-dependent solutions, and a model that allows agents to be aware of and reason about their own margins of errors. Chapter 9, by contrast, contains what van Deemter considers the more radical departures from the classical orthodoxy, namely, fuzzy logic and probabilistic logic. I won't go into further detail about these, but just point out what I think is a remainder of classical orthodoxy in van Deemter's overview. One of the proposals that isn't mentioned is the dual of the partial approach, namely a proposal based on a paraconsistent logic (where contradictions no longer entail everything). Such an approach formalises the idea that borderline cases can be treated as both  $P$  and not- $P$ .<sup>2</sup> With this omission, van Deemter implicitly sides with a more general tendency to dismiss these proposals (see e.g. Keefe 2000: 197ff), and insists that a solution or an explanation of a paradox should be based on a "consistent perspective" (p. 216). This isn't a big issue in the context of this book (which, after all, isn't intended as an overview of theories of vagueness), but in the light of van Deemter's initial dismissal of classical orthodoxy, I can't help to think of it as a missed opportunity.

<sup>1</sup> The term is taken from Huth and Ryan (2004).

<sup>2</sup> Until recently, only the sub-valuationist proposal investigated in Hyde (1997) was rather well-known, but recent proposals by Priest and by Ripley (2011) have substantially extended this line of research.

It is in the third part that van Deemter's own position is further motivated. One of the virtues of degree-theories of vagueness is that they allow us to abandon an additional instance of false clarity, namely the strict dichotomy between vague and crisp concepts (p. 218, at the end of the second part). This is possible because, for instance, the use of fuzzy logic leads to theories that can also accommodate degrees of vagueness. If, as is the case for van Deemter, one's working models of vagueness do not merely need to resolve the sorites, but are meant to inform us on how we should "teach" artificial agents to communicate, and in particular how to pass on vague information, then surely those models should tell us something about when one should be vague. Presumably, the question on when one ought to be vague can only be answered relative to a certain context. Yet, positing a strict distinction between vague and crisp predicates could, by treating all vague expressions alike, easily reduce this context-sensitivity to the single question of where we place the threshold in a given context. By contrast, by making room for degrees of vagueness, we open the door to multiple forms of context-sensitivity in the communication of vague information, and this could allow agents to use vague concepts more efficiently. This is a superb illustration of how practical constraints on the model one is building can also inform a purely theoretical enterprise.

The first chapter of this part (Chapter 10) contains a rather general overview of the field of artificial intelligence. In Chapter 11 van Deemter brings in additional theoretical resources from the theory of games, decision theory, and utility-theory to answer the questions when, why and how we should be vague.

When it comes to the question of how we should use vague expressions to communicate essentially numerical information (like the empirical data and computer generated predictions that are used for weather reports), one of the contextually relevant features is the expected cost of, for instance, announcing that certain roads are icy when they aren't (false positives) and announcing that they are not icy when in fact they are (false negatives). Since two vague renditions of the same set of numerical information might lead to a different ratio between the false positives and the false negatives, the decision of which vague expression one should use will have to depend on the intended use of the meteorological information (for instance, deciding which roads should be gritted). As such, the proper answer to the question when and how to be vague will be highly sensitive to the context in which certain information is communicated.

By reasoning about the expected pay-offs of using certain vague expressions, the related question of why the use of vague information could be beneficial is answered. While misleading others through the use of vague expressions can arguably be beneficial in situations where different players have conflicting aims, the benefits of vagueness in the absence of conflict is much less clear. This issue was already raised by the economist Barton Lipman, and points to the puzzling issue that if one seeks to communicate optimally, it isn't evident that vague expressions could be more useful than non-vague expressions. The latter question doesn't have a single answer, and van Deemter advances several complementary answers (based on considerations on unavoidable vagueness, ignorance, and efficient communication and action) to Lipman's puzzle.

There's no doubt that as a book for a broad audience, Kees van Deemter has done a wonderful job. This doesn't only show in the wide range of well-chosen examples, and in his accessible yet precise style, but also in the good mix between expository parts, detailed descriptions of examples, and the use of dialogues for the presentation of disagreements between different theoretical positions.

To conclude this review, I would therefore rather ask a different question: Can philosophically oriented logicians also learn something from this book? A part of the answer to that question is contained in the final chapter aptly titled "the expulsion from Boole's paradise," where van Deemter explicitly relates the avoidance of false clarity to the adoption of a non-classical logic. Of course, this is something we already know—witness the close connection between classical orthodoxy and epistemicism—but what van Deemter's narrative nicely illustrates is that the need to cope with sorites series is only one of the many reasons why we should adopt a different logic. To avoid false clarity we should recognise that vagueness comes in degrees.<sup>3</sup> More importantly, this implies that we need to recognise the flexibility of vague expressions to explain why we often convey vague rather than precise information (and why we're often right to do so). Relatedly—and this is something philosophers tend to forget—practical concerns, the need for working models of vagueness, and the attempts to implement such models are often more efficient in revealing the pitfalls of false clarity, than the isolated theoretical reflection on the paradoxical outcome of a forced-march sorites.

**Acknowledgments** Thanks to Kees van Deemter for helpful comments.

## References

- Huth, M., & Ryan, M. (2004). *Logic in computer science: Modelling and reasoning about systems*. Cambridge: Cambridge University Press.
- Hyde, D. (1997). From heaps and gaps to heaps of gluts. *Mind*, 106, 641–660.
- Keefe, R. (2000). *Theories of vagueness*. Cambridge: Cambridge University Press.
- Ripley, D. (2011). Contradictions at the borders. In: R. Nouwen, R. Rooij, U. Sauerland, & H.-C. Schmitz (Eds.), *Vagueness in communication* (pp. 169–188). Berlin: Springer.
- Shapiro, S. (2006) *Vagueness in context*. Oxford: Oxford University Press.

---

<sup>3</sup> But see Shapiro (2006) on how by distinguishing between the *artefacts* and the *representators* of a formal model, we can accommodate false clarity at the level of the model without thereby underestimating the flexibility of vague expressions in actual communication.