Introduction

The aim of this book is to formulate and defend the best possible theory of vagueness. First, I explore some general questions. What is vagueness and what are theories of vagueness? What should such theories be aiming to do? And how should we assess them?

My project is primarily one in the philosophy of logic and language. The focus is on finding the logic and semantics of vague language rather than, for example, illuminating the psychology of our use of it. But I am less concerned with formal modelling than with the philosophical rationale for any chosen type of model. Consequently, I minimise the technical discussion of complex logical material. This book should be accessible to anyone who has a grasp of elementary formal logic.

If you remove a single grain of sand from a heap of sand, you surely still have a heap of sand. But if you take a heap and remove grains one by one, you can apply that principle at each stage, which will commit you to counting even the solitary final grain as a heap. This is a sorites paradox. Arguments of a parallel form can typically be constructed for any vague term. For example, the generalisation ‘anyone one hundredth of an inch shorter than a tall man is also tall’ can be used to argue that a three-foot man is tall given that a seven-foot man is, by considering a series of men each one hundredth of an inch shorter than the previous one. And a tadpole does not become a frog in the space of one hundredth of a second, which invites an argument to the conclusion that a tadpole can never become a frog. No straightforward answer to this persistent type of paradox looks promising: the premises are highly plausible, the inference seems valid but the conclusions are absurd.

The paradox is best dealt with in the context of a theory of vagueness more generally – a theory which answers a range of other questions. Consider Tek, who is a borderline case of ‘tall’. We may
be inclined to say it is indeterminate whether or not Tek is tall: the meaning of ‘tall’ is too vague to fix a specific height marking the boundary between the tall and the not-tall. But what does this borderline status amount to? What should we say about the truth-value of the sentence ‘Tek is tall’? To call it true or call it false seems to misrepresent the apparent indeterminacy that characterises borderline cases. But can we allow sentences that are neither true nor false? And, if we do, are we just creating a new semantic category (containing those sentences that are neither true nor false) and committing ourselves to, for example, a sharp division between those things which are tall and those which neither are nor aren’t? A theory of vagueness must provide an account of borderline cases and of the (at least apparent) indeterminacy characterising vague predicates. And this is closely related to the need to provide a logic and semantics of vague language. For classical logic and semantics are committed to the principle that every statement is either true or false (the principle of bivalence) and borderline cases thus threaten the applicability to vague language of that familiar system. Perhaps a new logic or a new semantics is required.

The theory I seek to defend – supervaluationism – classifies borderline case predications as neither true nor false, and yet it yields a logical system that agrees with standard classical logic in the classification of logical truths and valid inferences (with some explicable exceptions). The essence of the theory is to evaluate vague sentences by reference to all ways of making them precise. Though there is no exact height that is the minimum height for counting as tall, ‘tall’ could be made precise by selecting such a height boundary among the borderline heights, without thereby altering the classification of the uncontentious cases. There is substantial choice available over such precise boundaries and if we are to avoid privileging a single one, we should count ‘Tek is tall’ as true if and only if it is true for all the choices. Similarly, ‘Tek is tall’ is false if and only if false on all ways of making it precise. So ‘a single grain forms a heap’ is false, because false on all ways of making ‘heap’ precise. But when $x$ is a borderline heap, ‘$x$ is a heap’ is not true on all ways of making it precise nor false on all those ways, so it counts as neither true nor false.

Supervaluationism has been recognised as a serious contender for a theory of vagueness since Fine’s highly influential defence of it (see his 1975). Passing comments and endorsements from philosophers in
Introduction

a variety of different contexts suggest that the theory is philosophically plausible and attractive. But among those tackling vagueness in more detail, supporters have been more rare, and a range of objections to the theory has gained popularity. It is time for a systematic defence of the theory. I argue that the standard objections fail and that the theory is much better than its rivals, and I concentrate on the philosophical justification of my position, leaving aside some details of its formalisation.

The first two chapters are devoted to foundational issues. The wide range of vague expressions is emphasised: most of our language is vague. This increases the urgency of providing a theory of the phenomena and an account of good reasoning in vague language. As well as providing an overview of the area, chapter 1 explores, partly in abstraction from particular theories of vagueness, some key issues which play a recurrent role in the rest of the book. For example it introduces higher-order vagueness, emphasising how the range of borderline cases for a vague predicate is itself not precisely determined. This phenomenon provides a revealing test which weeds out superficial treatments that ignore the persistence and depth of vagueness.

Chapter 2 addresses crucial questions of methodology which have been surprisingly ignored in the literature. It offers an account of how competing theories should be (and generally are) assessed and what constraints are imposed on theorising. I recommend seeking a reflective equilibrium that achieves the best balance between preserving as many as possible of our judgements or opinions of various kinds (intuitive and pre-philosophical ones among others) and meeting theoretical requirements such as simplicity. Having an explicit methodology to hand helps situate the subsequent discussions of individual theories, putting criticisms in perspective and aiding comparative judgements. The final section of chapter 2 will also help in similar ways: I there examine the attitude displayed by theorists who hope to avoid worries about certain elements of their theory by casually remarking that what they offer is ‘only a model’. I argue that in many circumstances this is unacceptable.

In conformity with my methodology, to defend a supervaluationist theory of vagueness I must show that rival theories either fail to reach a reflective equilibrium, or can only reach one that violates consider-
Theories of vagueness

ably more of our intuitions and opinions than my favoured alternative. The major rival theories are dealt with in detail in chapters 3 to 6, and at various points along the way other candidates are rejected (including Unger’s nihilism, intuitionistic accounts, and hybrids of and variants on the main contenders).

Chapter 3 considers the epistemic view, according to which a borderline heap does either truly or falsely count as a heap, though we do not know which. Being a borderline case, it is unclear whether or not it is a heap, but this lack of clarity is owed to a special and unavoidable kind of ignorance. There is a particular instant in the process of removing grains at which you cease to have a heap, and all vague predicates are similarly sharply bounded. Classical logic and semantics are retained in their entirety. Although this theory is initially implausible, it has received an extremely thorough and influential defence in Williamson 1994. I offer objections to Williamson. Nevertheless, I do not claim to show that his theory is not viable: bullet-biting responses are generally available, though with each such response, the theory becomes less and less appealing. Williamson himself rests much of his case for the view on his criticisms of its rivals, and I show in chapters 7 and 8 that his criticisms of supervaluationism fail. In short, I think there is a much better alternative to the epistemic view.

If it is not viable to retain classical logic and semantics or accept that our vague predicates are sharply bounded, perhaps the leap from truth to falsity is avoided because borderline case predications have some other non-classical value. A popular approach to vagueness adopts this line and employs a many-valued logic which generalises the logic of two-values to accommodate the extra values. Chapters 4 and 5 are directed against these theories and I amass a number of different objections. The moral is that we cannot just assign an interpretation to a predicate – even a many-valued interpretation – and then use truth-functional definitions of the connectives to capture the logic. A different approach is needed.

Chapter 6 considers the pragmatic view, which treats vagueness, not as a feature of a language, but as a matter of the relation between users and language. The hope of its advocates is that classical logic and semantics can be retained, but without the commitments of the epistemic view, since there is no unique sharp language which is used by all English-speakers. I show that,
Introduction

depending on how the proposal is understood, either the theory fails or it collapses into supervaluationism.

The remaining alternative is thus to modify classical semantics and give up trying to treat the usual logical connectives truth-functionally. Supervaluationism takes this path. A vague predicate such as ‘tall’ need not then have a unique sharply bounded extension, nor need it be associated with a function from people to a set of more than two values. Instead, sentences involving that predicate are assessed by reference to the range of alternative precise extensions corresponding to ways of making the predicate precise. As well as the account I defend, I survey and reject some alternative ways to employ the same, or a similar, framework, including ones that deviate from classical logic. The discussion of my own theory spans chapters 7 and 8.
1

The phenomena of vagueness

1. CENTRAL FEATURES OF VAGUE EXPRESSIONS

The parties to the vigorous debates about vagueness largely agree about which predicates are vague: paradigm cases include ‘tall’, ‘red’, ‘bald’, ‘heap’, ‘tadpole’ and ‘child’. Such predicates share three interrelated features that intuitively are closely bound up with their vagueness: they admit borderline cases, they lack (or at least apparently lack) sharp boundaries and they are susceptible to sorites paradoxes. I begin by describing these characteristics.

Borderline cases are cases where it is unclear whether or not the predicate applies. Some people are borderline tall: not clearly tall and not clearly not tall. Certain reddish-orange patches are borderline red. And during a creature’s transition from tadpole to frog, there will be stages at which it is a borderline case of a tadpole. To offer at this stage a more informative characterisation of borderline cases and the unclarity involved would sacrifice neutrality between various competing theories of vagueness. Nonetheless, when Tek is borderline tall, it does seem that the unclarity about whether he is tall is not merely epistemic (i.e. such that there is a fact of the matter, we just do not know it). For a start, no amount of further information about his exact height (and the heights of others) could help us decide whether he is tall. More controversially, it seems that there is no fact of the matter here about which we are ignorant: rather, it is indeterminate whether Tek is tall. And this indeterminacy is often thought to amount to the sentence ‘Tek is tall’ being neither true nor false, which violates the classical principle of bivalence. The law of excluded middle may also come into question when we consider instances such as ‘either Tek is tall or he is not tall’.

Second, vague predicates apparently lack well-defined extensions. On a scale of heights there appears to be no sharp boundary between
The phenomena of vagueness

the tall people and the rest, nor is there an exact point at which our growing creature ceases to be a tadpole. More generally, if we imagine possible candidates for satisfying some vague $F$ to be arranged with spatial closeness reflecting similarity, no sharp line can be drawn round the cases to which $F$ applies. Instead, vague predicates are naturally described as having fuzzy, or blurred, boundaries. But according to classical logic and semantics all predicates have well-defined extensions: they cannot have fuzzy boundaries. So again this suggests that a departure from the classical conception is needed to accommodate vagueness.

Clearly, having fuzzy boundaries is closely related to having borderline cases. More specifically, it is the possibility of borderline cases that counts for vagueness and fuzzy boundaries, for if all actually borderline tall people were destroyed, ‘tall’ would still lack sharp boundaries. It might be argued that for there to be no sharp boundary between the $F$s and the not-$F$s just is for there to be a region of possible borderline cases of $F$ (sometimes known as the penumbra). On the other hand, if the range of possible borderline cases between the $F$s and the not-$F$s was itself sharply bounded, then $F$ would have a sharp boundary too, albeit one which was shared with the borderline $F$s, not with the things that were definitely not $F$. The thought that our vague predicates are not in fact like this – their borderline cases are not sharply bounded – is closely bound up with the key issue of higher-order vagueness, which will be discussed in more detail in §6.

Third, typically vague predicates are susceptible to sorites paradoxes. Intuitively, a hundredth of an inch cannot make a difference to whether or not a man counts as tall – such tiny variations, undetectable using the naked eye and everyday measuring instruments, are just too small to matter. This seems part of what it is for ‘tall’ to be a vague height term lacking sharp boundaries. So we have the principle $[S_{1}]$ if $x$ is tall, and $y$ is only a hundredth of an inch shorter than $x$, then $y$ is also tall. But imagine a line of men, starting with someone seven feet tall, and each of the rest a hundredth of an inch shorter than the man in front of him. Repeated applications of $[S_{1}]$ as we move down the line imply that each man we encounter is tall, however far we continue. And this yields a conclusion which is clearly false, namely that a man less than five feet tall, reached after three thousand steps along the line, is also tall.
Similarly there is the ancient example of the heap (Greek *soros*, from which the paradox derives its name). Plausibly, [S₂] if x is a heap of sand, then the result y of removing one grain will still be a heap – recognising the vagueness of ‘heap’ seems to commit us to this principle. So take a heap and remove grains one by one; repeated applications of [S₂] imply absurdly that the solitary last grain is a heap. The paradox is supposedly owed to Eubulides, to whom the liar paradox is also attributed. (See Barnes 1982 and Burnyeat 1982 for detailed discussion of the role of the paradox in the ancient world.)

Arguments with a sorites structure are not mere curiosities: they feature, for example, in some familiar ethical ‘slippery slope’ arguments (see e.g. Walton 1992 and Williams 1995). Consider the principle [S₃] if it is wrong to kill something at time t after conception, then it would be wrong to kill it at time t minus one second. And suppose we agree that it is wrong to kill a baby nine months after conception. Repeated applications of [S₃] would lead to the conclusion that abortion even immediately after conception would be wrong. The need to assess this kind of practical argumentation increases the urgency of examining reasoning with vague predicates.

Wright (1975, p. 333) coined the phrase *tolerant* to describe predicates for which there is ‘a notion of degree of change too small to make any difference’ to their applicability. Take ‘is tall’ (for simplicity, in mentioning predicates I shall continue, in general, to omit the copula). This predicate will count as tolerant if, as [S₁] claims, a change of one hundredth of an inch never affects its applicability. A tolerant predicate must lack sharp boundaries; for if F has sharp boundaries, then a boundary-crossing change, however small, will always make a difference to whether F applies.¹ Moreover, a statement of the tolerance of F can characteristically serve as the inductive premise of a sorites paradox for F (as in the example of ‘tall’ again).

Russell provides one kind of argument that predicates of a given class are tolerant: if the application of a word (a colour predicate, for example) is paradigmatically based on unaided sense perception, it surely cannot be applicable to only one of an indiscriminable pair (1923, p. 87). So such ‘observational’ predicates will be tolerant with

¹ Note that throughout this book, when there is no potential for confusion I am casual about omitting quotation marks when natural language expressions are not involved, e.g. when talking about the predicate F or the sentence p & ¬p.
The phenomena of vagueness

respect to changes too small for us to detect. And Wright develops, in
detail, arguments supporting the thesis that many of our predicates are
tolerant (1975 and 1976). In particular, consideration of the role of
ostension and memory in mastering the use of such predicates appears
to undermine the idea that they have sharp boundaries which could
not be shown by the teacher or remembered by the learner.
Arguments of this kind are widely regarded as persuasive: I shall refer
to them as ‘typical arguments for tolerance’. A theory of vagueness
must address these arguments and establish what, if anything, they
succeed in showing, and in particular whether they show that the
inductive premise of the sorites paradox holds.

Considerations like Russell’s and Wright’s help explain why vague
predicates are so common (whatever we say about the sorites
premise). And they also seem to suggest that we could not operate
with a language free of vagueness. They make it difficult to see
vagueness as a merely optional or eliminable feature of language. This
contrasts with the view of vagueness as a defect of natural languages
found in Frege (1903, §56) and perhaps in Russell’s uncharitable
suggestion (1923, p. 84) that language is vague because our ancestors
were lazy. A belief that vagueness is inessential and therefore unim-
portant may comfort those who ignore the phenomenon. But their
complacency is unjustified. Even if we could reduce the vagueness in
our language (as science is often described as striving to do by
producing sharper definitions, and as legal processes can accomplish
via appeal to precedents), our efforts could not in practice eliminate it
entirely. (Russell himself stresses the persistent vagueness in scientific
terms, p. 86; and it is clear that the legal process could never reach
absolute precision either.) Moreover, in natural language vague
predicates are ubiquitous, and this alone motivates study of the
phenomenon irrespective of whether there could be usable languages
totally free of vagueness. Even if ‘heap’ could be replaced by some
term ‘heap*’ with perfectly sharp boundaries and for which no sorites
paradox would arise, the paradox facing our actual vague term would
remain. And everyday reasoning takes place in vague language, so no
account of good ordinary reasoning can ignore vagueness.

See Carnap 1950, chapter 1, Haack 1974, chapter 6 and Quine 1981 on the replace-
ment of vague expressions by precise ones, and see Grim 1982 for some difficulties
facing the idea. Certain predicates frequently prompt the response that there is in fact a
sharp boundary for their strict application, though we use them more loosely – in par-
Theories of vagueness

In the next section I shall discuss the variety of vague expressions – a variety which is not brought out by the general form of arguments for tolerance. First, I clarify the phenomenon by mentioning three things that vagueness in our sense (probably) is not.

(a) The remark ‘Someone said something’ is naturally described as vague (who said what?). Similarly, ‘X is an integer greater than thirty’ is an unhelpfully vague hint about the value of X. Vagueness in this sense is underspecificity, a matter of being less than adequately informative for the purposes in hand. This seems to have nothing to do with borderline cases or with the lack of sharp boundaries: ‘is an integer greater than thirty’ has sharp boundaries, has no borderline cases, and is not susceptible to sorites paradoxes. And it is not because of any possibility of borderline people or borderline cases of saying something that ‘someone said something’ counts as vague in the alternative sense. I shall ignore the idea of vagueness as underspecificity: in philosophical contexts, ‘vague’ has come to be reserved for the phenomenon I have described.

(b) Vagueness must not be straightforwardly identified with paradigm context-dependence (i.e. having a different extension in different contexts), even though many terms have both features (e.g. ‘tall’). Fix on a context which can be made as definite as you like (in particular, choose a specific comparison class, e.g. current professional American basketball players): ‘tall’ will remain vague, with borderline cases and fuzzy boundaries, and the sorites paradox will retain its force. This indicates that we are unlikely to understand vagueness or solve the paradox by concentrating on context-dependence.\(^3\)

(c) We can also distinguish vagueness from ambiguity. Certainly, terms can be ambiguous and vague: ‘bank’ for example has two quite different main senses (concerning financial institutions or river edges), both of which are vague. But it is natural to suppose that ‘tadpole’ has a univocal sense, though that sense does not determine a sharp, well-defined extension. Certain theories, however, do

\(^3\) There have, however, been some attempts at this type of solution to the sorites paradox using, for example, more elaborate notions of the context of a subject’s judgement (see e.g. Raffman 1994).