

# HOW GNOMES CAN HELP US SOLVE THE SORITES PARADOX

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## VAGUENESS AND THE SORITES

Vague predicates are characterised by *borderline cases*: red/orange, bald, child/adult etc. This leaves them open to the following argument (the Sorites paradox):

(P1) 1 million grains of sand is a heap  
(CP) If  $n$  grains of sand is a heap,  $n - 1$  grains is still a heap  
Therefore: 1 grain of sand is a heap

We may want to reject (CP), but this implies there is some  $n$  such that  $n$  grains of sand is a heap, but  $n - 1$  grains is not. The intuition is that there can be no such sharp cut off.

Note we are not looking at the phenomena of *context* dependence here (think, what do we mean by 'small'), though many vague predicates also have some context sensitivity.

Classic accounts of vagueness try to solve the Sorites paradox through giving an account of the *logic* of vague predicates. Interestingly, insight from the toy world I create gives a plausible solution for the Sorites, but does not bring us much closer to deciding the logic of vague predicates - hence it is a 'minimalist' solution.

## 1. THE MODEL WORLD

### 1.1. The model.

- gnomes (epistemic and linguistic agents)
- domain of objects  $D$
- feature  $Q$  of these objects which varies continuously

$$Q : D \rightarrow \mathbb{R}$$

so for any object  $x$  in the domain,  $Q(x)$  is some real number

1.2. **Gnome perception.** Let  $S$  be a gnome. When  $S$  investigates an object  $x$  she ‘perceives’ that  $Q(x)$  lies in some interval  $[a, b] \subset \mathbb{R}$ .  $S$  can investigate further to find  $Q(x)$  is within a smaller interval  $[a_1, b_1] \subset [a, b]$ .

So

- $S$  comes to understand that  $Q(x)$  is some specific value, not an interval
- Investigation takes time so  $S$  can never know the exact value of  $Q(x)$

1.3. **Properties and predicates.** Now we concentrate on a particular predicate our gnome wants to introduce into the gnome language. Suppose  $S$  wants to pick out a property of objects’  $Q$ -value and proposes to define a predicate  $P$  by:

$$Px \leftrightarrow Q(x) > 0$$

Note:

- $S$  may not be able to tell of a particular object  $x$  whether  $Px$  holds
- $S$  may never be able to find this out, no matter how much she investigates

1.4. **Frame fixing.** We now assume that the perceptions of the gnomes are not calibrated in terms of how the ‘real line’ is labelled.

- perception is mental/private
- Wittgenstein’s private language argument

1.5. **Talking.** How can  $S$  communicate the meaning of this predicate  $P$  such that  $Px \leftrightarrow Q(x) > 0_S$  ( $0_S$  is what  $S$  calls zero)?

Two options

- Definition by ostension
  - there will be a gap where (i)  $S$  can’t tell if  $P(x)$  holds and (ii) there are simply no objects to point to
- Choose an object to frame-fix
  - abandon  $P$  and define  $P'$  by

$$P'(x) \leftrightarrow Q(x) > Q(a)$$

for some object  $a$  with  $Q(a)$  close to  $0_S$

1.6. **Transience.** The gnome  $S$  dies. The object used for frame fixing disintegrates. A new generation is taught the language.

- The gnomes want to carry on using  $P$  (or  $P'$ ) as before (so definition by ostension)
- No gnome is really in a privileged position

- Each has a different idea of where  $P$  holds and where  $\neg P$  holds, and a gap where they don't know

Is this genuine vagueness?

### 1.7. Conclusions.

- The predicates were explicitly classical/bivalent when initially defined  
→ epistemic account
- But meaning can change: nothing in the gnomes later *use* to determine the exact boundary
- Different gnomes have different 'borderline regions'  
→ supervaluationist account

Seems we need a broader account of meaning to decide between them.

But why do we need a specific account of vagueness?

## 2. THE SORITES PARADOX

### 2.1. The Sorites Paradox.

(P1) 1 million grains of sand is a heap

(CP) If  $n$  grains of sand is a heap,  $n - 1$  grains is still a heap

Therefore: 1 grain of sand is a heap

Why accept (CP)?

- We don't want to accept its negation
- The agent-centred view

### 2.2. The agent-centred Sorites.

(D1) An agent competent with the vague predicate must not change their valuation of whether it holds between two cases they cannot distinguish

(D2) It is possible to give a sequence of cases such that the agent could not distinguish between adjacent cases

Adding to this that the agent must judge that the predicate holds in some cases, we get a forced march: the agent must judge the predicate to hold in all cases.

### 3. DISAMBIGUATING ‘INDISTINGUISHABLE’

3.1. **No forced march for the gnomes.** What do we mean by ‘not able to distinguish’ for the gnomes?

- Option 1: a gnome has the same state of knowledge about the two cases (perceives the same interval)
- Option 2: a gnome does not know enough to tell the two cases are different (perceived intervals overlap)

Option 1 will give us (D1) but not (D2).

Option 2 will give us (D2) but not (D1).

→ No forced march for gnomes!

3.2. **Two notions of ‘indistinguishable’.** I propose a parallel distinction in the human case:

- Option 1: ‘indistinguishable’ as same perceptual information
- Option 2: ‘indistinguishable’ as not justified in distinguishing

Again, neither of these will work in both (D1) and (D2).

3.3. **Consciousness?** Surely we either see a difference or we don’t?

- (1) Our judgement can be affected by something we are not conscious of *and still be justified*
- (2) We can be conscious of a difference without being conscious of it as a difference

Reflecting on our judgements we would not be able to see the reason for the change

→ perception is not epistemically transparent

### 4. A SOLUTION?

4.1. **Does this solve the paradox?**

- We have shown the reasoning in the agent centred sorites argument to be flawed
- But we still have (CP) supported by our conviction that there is no exact cut off for a vague predicate

So we could bite the bullet and give an epistemic account

- we have to some extent undermined our intuitions against it
- contextual sensitivity can also help here

But it still seems there are cases where our language could not determine a cut-off.

4.2. **Partial logic.** Perhaps an alternative is to use some sort of partial logic (such as partial strong Kleene) to govern our reasoning about vague predicates.

- This is not making vague predicates 3-valued (true, false and neither)
- Rather we restrict our reasoning with vague predicates, so we can refuse to accept either (CP) or  $\neg$ (CP)
- This doesn't preclude an epistemic account being correct

Is this a cop-out?

Partly. But as with the gnomes I think an account of the meaning of vague terms must derive from an account of meaning in general. And then avoiding the sorites can be a test of such accounts.