Reply to Ondrej Majer's Comments on
Vagueness, Tolerance and Non-Transitive Entailment

ROBERT VAN ROOIJ

In the paper I suggested that for many predicates *P*, the '*P*-er than' relation is a strict weak order. Ondrej Majer asks why I assume that, given that I concentrate myself later in the paper on semi-orders. Well, in case the ordering relation can be made more precise by means of measurement phrases, there is no choice but to use a strict weak order. In fact, speaker's intuitions about a relation like 'taller than' very much correspond with that of strict weak orders. Having said that, I realize very well that there are many comparative relations which have only weaker properties (for instance only a partial order), 'smarter than' is arguably one of them. My point for introducing strict weak orders was not so much to claim that most comparative relations are of this type, but rather that if this is assumed, it can hardly be explained why the Sorties paradox is a problem. I believe that the Sorites paradox only arises because the way *we* normally observe *tallness*, for instance, the *observably taller than*-relation should be a semi-order, rather than a strict weak one.

Can the use of degrees in the measurement of semi-orders not be used to formulate a degree-based analysis of vagueness?, Ondrej Majer wonders. Perhaps, I didn't try out, and I invite Majer to work out this interesting thought. But I agree with Ondrej that there exists a certain similarity between the approach I favor and fuzzy logic-based analyses of logic. In contrast to most standard logicians and semanticists I am not impressed by the standard objections that formulas like $Pa \wedge \neg Pa$ and $Pa \vee \neg Pa$ are not predicted to be contradictions and tautologies, respectively, if *P* is a vague predicate. In fact, this is at it should be (see Atxatib and Pelletier, 2011 and Ripley, 2011), and my notions of strict and tolerant satisfaction account for this. Moreover, I believe that the most natural notion of consequence that can be formulated using using fuzzy logic is a non-transitive one. Having said that, I don't believe that we need as many values of truth that fuzzy logicians standardly assume: three or four can do a whole lot.

Ondrej Majer correctly observes that given the semantics I propose, there are a number of tolerant (non-transitive) consequence relations that can be formulated. In the paper I suggest to use consequence relation *ct* (according to which the conclusion should be (at least) tolerantly true, if all the premisses are (at least) classically true), and Majer reasonably asks why? In fact, in Cobreros et al. (2011) we use the same semantics but propose a different notion of logical consequence: *st*-consequence, according to which the conclusion should be (at least) tolerantly true, if all the premisses are (at least) strictly true. The preference for this consequence relation is motivated by the following observation: *st*-consequence is the only consequence relation that validates the tolerance principle, the deduction principle, and modus ponens.

Ondrej Majer wonders whether I would like to use classical consequence for crisp predicates and tolerant consequence for vague ones. This is certainly one possibility, but perhaps not the most natural one. I assumed that for vague predicates there is a difference between strict, classical, and tolerant satisfaction. It is natural to assume, however, that such a distinction does not exist for crisp predicates. In that case, my tolerant notion of consequence comes down to classical consequence, and I don't need two distinct notions of consequence. I believe this is a natural way to treat crisp predicates. This is perhaps especially the case because there seems to exist predicates that have both crisp and tolerant readings, like *bald*. It is perhaps more natural to assume two distinct readings of *bald* than two ways of reasoning with it.

If ones observes a problem with a logic to describe some phenomena, there are at many times two strategies available. Either you change the logic, or you reformulate the sentences, or the principles you wanted to model. In fact, this was in a sense the point of the paper: Williamson (1994) and others wanted to model vagueness, and the tolerance-principle that governed it. However, many of them relied very much on classical logic. They thus had to reformulate the tolerance-principle. Similarly, Ondrej Majer proposes to reformulate the sentences that talk about vagueness in terms of modal statements. Instead of using this strategy, I proposed to reformulate the logic. Now, it was already well-known that the Sorites paradox could be solved by giving up on transitivity of inference, but it was generally agreed that this was a no-go, because entailment is transitive, isn't it? Well, no, it doesn't have to (in exceptional circumstances)! Except for logical conservatism, I don't see any good reason to stick to this old notion of consequence. Moreover, there is nothing wrong with a non-transitive notion of consequence: it has a clear semantics, and later work by me and co-workers (Pablo Cobreros, Paul Égré, and David Ripley) shows that this logic also has a very natural proof-theory and can be used to solve a number of other paradoxical phenomena as well (such as the liar paradox). Furthermore, this framework is arguable a more natural description of some empirical observations made by Atxatib and Pelletier (2011) and Ripley (2011) than a modal one as suggested by Ondrej Majer. Thus, I like the reformulation of Ondrej to give a modal reformulation of my model, but no, I am not going to follow it.

BIBLIOGRAPHY

Alxatib, S. and J. Pelletier (2011), 'The psychology of vagueness: Borderline cases and contradictions', *Mind and Language*. **26**: 287–326

Cobreros, P., P. Égré, D. Ripley, and R. van Rooij (2011a), 'Tolerent, classical, strict', to appear in *Journal of Philosophical Logic*, DOI: 10.1007/210992-010-9165-z.

Cobreros, P., P. Égré, D. Ripley, and R. van Rooij (2011b), 'Supervaluationism and mixed consequence in a super-/sub-valuationist setting', to appear in *Studia Logica*.

Cobreros, P., P. Égré, D. Ripley, and R. van Rooij (2011c), 'Reaching transparent truth', submitted.

Ripley, D. (2011), 'Contradictions at the borders', in R. Nouwen, R. van Rooij, U. Sauerland, and H. Schmitz (eds.), *Vagueness in Communication*, Springer, pp. 169–188

Williamson, T. (1994), *Vagueness*, Rootledge, London.