# No Argument against the Continuity of Value: Reply to Dorsey

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In 'Headaches, Lives and Value',[1] Dale Dorsey declares this to be a valid inference (the wording is his):

*Premise 1*. A headache is bad.

*Premise 2*. Bads can be aggregated across persons to form worse bads.

*Premise 3*. For every bad $x$, there is a bad of lesser weight $y$, enough of which will outweigh the disvalue of $x$.

*Premise 4*. If A is better than B, and B is better than C, then A is better than C.

*Conclusion*. There is some number of headaches such that the relief of those headaches is sufficient to outweigh the good life of an innocent person.

Dorsey rejects Conclusion, so he believes he must reject one of the premises. He argues that the best option is to reject Premise 3. Rejecting Premise 3 entails a certain sort of discontinuity in value. So Dorsey believes he has an argument for discontinuity.

However, the above inference is not valid, and provides no argument for discontinuity. Larry Temkin claimed in 1996 that a similar inference is valid.[2] Ken Binmore and Alex Voorhoeve took the trouble to respond to Temkin, explaining his analytical mistake.[3] Binmore and Voorhoeve's message evidently needs to be reiterated, now that Dorsey has followed Temkin into the same pitfall. I shall give a counterexample to Dorsey's inference. In my example, Premises 1–4 are true but Conclusion is false. I am saying nothing new: a similar example appears in Binmore and Voorhoeve's paper.

In any case, anyone with a little knowledge of mathematical analysis will already have spotted the mistake in Dorsey's inference. Starting from the death of an innocent person, Premise 3 tells us there is an

[1] *Utilitas*, 21 (2009), pp. 36–58. The premises and conclusion are stated on p. 36; the claim that the inference is valid is on p. 37.
[2] 'A Continuum Argument for Intransitivity', *Philosophy and Public Affairs* 25 (1996), pp. 175–210, at p. 180.
[3] 'Defending Transitivity against Zeno's Paradox', *Philosophy and Public Affairs* 31 (2003), pp. 272–9.


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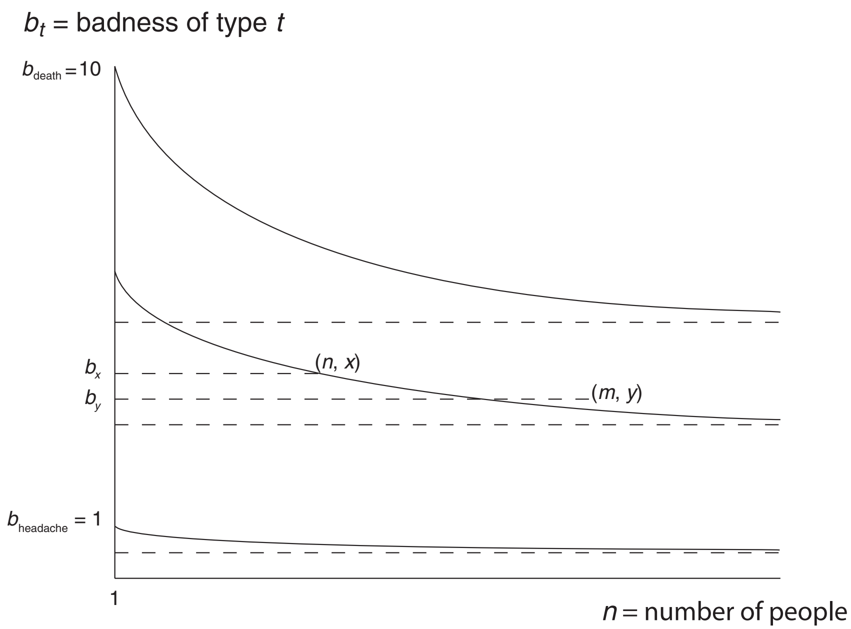
infinite sequence of bads, each less bad than the one before, such that enough of each will outweigh the previous bad in the sequence. But the premises do not entail that this sequence will get as far as the slight bad of a headache.

Here is the example. Let an 'event' denoted by $(n, t)$ consist in $n$ people's each suffering a bad of type $t$. I assume that events are ordered by the worse-than relation. I assume this ordering is represented by a 'badness function' $b(n, t)$, whose values are real numbers. This function assigns to each event a real number called the event's 'badness'.

Write $b(1, t)$ – the badness of a single person's suffering a bad of type $t$ – as $b_t$. We can think of $b_t$ as a measure of the badness of a bad of type $t$. I assume that, for any real number $a$ between 0 and 10 inclusive, there is a type of bad $t$ such that $b_t$ is equal to $a$. In effect, this means that types of bad make up a continuum. I assume the badness $b_{\text{death}}$ of a death is 10 and the badness $b_{\text{headache}}$ of a headache is 1.

I assume this specific form for the badness function:

$$b(n, t) = b_t(2 - 1/n).$$




The diagram displays this function. Its vertical axis shows different types of bad $t$, scaled by their badness $b_t$, The horizontal axis shows numbers of people. Each point in the diagram with coordinates $(n, b_t)$ represents an event of $n$ people's suffering a bad of badness $b_t$. The curves are contours of equal badness; each contour connects together

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events that are equally bad. (Only the points on each contour where $n$ is a whole number represent real possibilities.) Moving north-eastward across the contours takes us to progressively worse and worse events. My specific badness function determines that the contour that starts at the level of $b_t$ for any $t$ has an asymptote at the level of $b_t/2$.

Premise 1 is satisfied in the example because increasing the number $n$ of people who suffer a headache makes the event ($n$, headache) worse. Premise 2 is satisfied because increasing the number $n$ of people who suffer any particular bad $t$ makes the event $(n, t)$ worse. Premise 4 is satisfied because events are ordered by the worse-than relation. The diagram shows as follows that Premise 3 is satisfied. For any event $(n, x)$, pick a bad of type $y$ such than $b_y$ lies strictly between $b_x$ and the asymptote of the equal-badness contour on which the event $(n, x)$ lies. The diagram shows that, provided $m$ is large enough, the event $(m, y)$ lies above the contour of $(n, x)$, which means it is worse than $(n, x)$.

Finally, Conclusion is false in the example. According to the formula, the badness $b(n$, headache) of the event of $n$ people's suffering a headache is $(2 - 1/n)$. This badness increases as $n$ increases. But however big $n$ gets, the badness of this event never exceeds 2. That is less than 10, the badness of one person's death. So one person's death is worse than any number of headaches.

The badness function in my example is continuous. No argument for discontinuity has emerged.

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