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REMARKS ON JOVE AND THOR

Jeremy Gwiazda

In "How an Unsurpassable Being can Create a Surpassable World," Daniel and Frances Howard-Snyder employ a fascinating thought experiment in an attempt to show that a morally unsurpassable being can create a surpassable world. Imagine that for each positive integer there is a world that a good, omnipotent, omniscient being can create. Jove randomly selects a number and creates the corresponding world; Thor simply creates world 888. The Howard-Snyders argue that it is logically possible that Jove is morally unsurpassable. William Rowe counters that Thor morally surpasses Jove, thus contradicting the claim that Jove is morally unsurpassable. Does either Jove or Thor morally surpass the other? How do their strategies compare? Could a morally unsurpassable being employ Jove's strategy? The purpose of this paper is to answer these questions.

Can an unsurpassable being create a surpassable world? The question is important as many theists believe that an unsurpassable being, God, created this surpassable world. Furthermore, if an unsurpassable being cannot create a surpassable world and there exists an unending sequence of increasingly good creatable worlds, then an unsurpassable being cannot create any world.¹ The Howard-Snyders present a fascinating thought experiment in an attempt to show that an unsurpassable being can create a surpassable world. Imagine that for each positive integer (1, 2, 3 . . .) there is a world that a good, omnipotent, omniscient being can create. Higher numbered worlds are morally better than lower numbered worlds. Two beings employ different strategies² to create a world: Jove activates a randomizing device, which returns the number 777, and thereupon Jove creates the corresponding world; Thor simply creates world 888. The Howard-Snyders argue that it is logically possible that Jove is morally unsurpassable.³ William Rowe counters that Thor morally surpasses Jove, thus contradicting the claim that Jove is morally unsurpassable.⁴

Does either Jove or Thor morally surpass the other? How do their strategies compare? Could a morally unsurpassable being employ Jove's strategy? The purpose of this paper is to answer these questions. I begin by demonstrating the remarkable power of Jove's strategy.

I. The Power of Jove's Strategy

Instead of positing that Jove randomly selects 777,⁵ let us compare the strategies of Jove and Thor. Thor's strategy is constant; he creates world 888. Now let us ask: What is the probability that Jove, employing his strategy of randomly selecting a positive integer, will select a number less than



or equal to 888? There is merely a positive infinitesimal probability that Jove will select a number less than or equal to 888. A positive infinitesimal is a number greater than 0, but less than any real number. The probability is greater than 0 because Jove could select 3, which is less than or equal to 888. But the probability is less than any real number because there are finitely many numbers less than or equal to 888, out of infinitely many numbers total. The probability of choosing one of a finite number of outcomes (888) out of an infinite number of outcomes (all positive integers) both cannot be a real number and must be less than every positive real number. Thus the probability that Jove selects a number less than or equal to 888 is a positive infinitesimal.

Let me recast the argument in a form that will appeal to those who enjoy placing a bet. Consider the bet of over/under 888.5. That is, you are deciding whether Jove will select a number under 888.5, or over 888.5. There are finitely many positive integers under 888.5. There are infinitely many over. Conclusion: the over is a very solid bet.

In this paragraph, I outline how hyperreal numbers can be used to give the exact infinitesimal probability that Jove selects a world from a given set of worlds, which I call the "success set." These hyperreal numbers are introduced as they allow us to discuss infinitesimal (and later, infinite) numbers; however, whenever I argue to a conclusion based on a consideration of hyperreal numbers, I will also include informal arguments to that same conclusion, as in the two paragraphs above. At present we are concerned with the following problem. Jove is selecting one number from among all positive integers. Given a success set (e.g., $\{1, 2, 3, \dots, 887, 888\}$), what is the probability that Jove selects a number in the success set? To begin with a small, concrete example, let us ask: What is the probability that Jove selects 1, 2, or 3; that is, the success set is $\{1, 2, 3\}$?⁶ The answer is given by building a hyperreal number, which is a sequence of real numbers.⁷ Each term of the sequence is a fraction. Denominators are 1, 2, 3, 4 Each numerator is the number of numbers less than or equal to the denominator that are in the success set. Thus the hyperreal number representing the probability that Jove selects 1, 2, or 3 is $(1/1, 2/2, 3/3, 3/4, 3/5, 3/6, 3/7, \dots)$.⁸ This hyperreal number, call it ϵ , is an infinitesimal. It is the probability that Jove selects worlds 1, 2, or 3.⁹ A further example may prove helpful. What is the probability that Jove selects a number greater than 3, i.e., the success set is $\{4, 5, 6, 7, \dots\}$? The answer is $(0/1, 0/2, 0/3, 1/4, 2/5, 3/6, 4/7, \dots)$. This number is infinitesimally close to, but less than, 1. In fact, it is $1 - \epsilon$.

The key fact, argued in the previous three paragraphs, is that the probability that Jove randomly selects a number less than or equal to 888 is infinitesimal. The probability that Jove selects a number greater than 888 is certainty (100% or 1) minus this infinitesimal, henceforth "almost certain." In fact, Jove is infinitesimally likely to select a number less than *any* given positive integer. To see this, note that in the reasoning above, 888 (also 3) played no crucial role; 888 can be replaced by any positive integer. The probability that Jove selects a number less than or equal to 100^{100} is infinitesimal. Assuming that past some number, C , we would not be able to comprehend the representation of any larger number, then Jove is infinitesimally likely to select a number whose representation we will be able to comprehend. Put another way, it is almost certain that we

will not be able to comprehend Jove's selected number, as it is almost certain that Jove will select a number greater than C. (The Howard-Snyders have Jove select 777 and Juno select 999. Each being is said to select at random.¹⁰ We can comprehend both of these numbers. Recall that it was almost certain that we would not be able to comprehend these numbers. My suspicion is that Jove and Juno are not actually randomly selecting positive integers.)

As Jove is almost certain to select a larger number than Thor, I believe that Jove morally surpasses Thor.¹¹ Too much concern has been placed on the possibility of Jove's selecting a low number, such as 777. Too little concern has been given to Thor's opting out of creating a number larger than 888. Rowe writes:

Thor's degree of moral goodness presumably is such that he is prepared to settle for world no. 888, but not prepared to settle for the world (no. 777) that Jove's degree of moral goodness allows him to settle for. We thus have reason to believe that Thor's degree of moral goodness exceeds Jove's, that Thor is morally better than Jove.¹²

It is true that Thor will not settle for a world less than 888; however, Thor will not strive for a world greater than 888. There are many more worlds greater than 888 than there are worlds less than 888. If either of Jove or Thor is settling, it is Thor. But what if Jove does select 777 (note that 777 is as likely to be selected as is any other number)? The Howard-Snyders are correct when they write, "Factors outside of one's control can make a difference to how much good one brings about *without* making a difference to how good one is. Jove has no control over what number his randomizer will deliver."¹³

Jove surpasses Thor. Jove also surpasses any being who employs the strategy of selecting a constant number. That is, it is not the case that if only Thor had selected a higher number then Thor would surpass Jove. To see this, let us introduce an entire sequence of omnipotent beings, called the "Thor-sequence." Thor simply created world 888. Rename this being "Thor₈₈₈." In general, let Thor_N create world N. Now consider the following omnipotent beings: Jove, Thor₁, Thor₂, Thor₃, . . . Which one of these beings is morally best? I take this question to mean: Which one of these beings would a rational person choose to create his world? The answer is Jove, as for any N, Jove is infinitesimally likely to select a smaller number than Thor_N (i.e., N), and almost certain to select a larger number than Thor_N. Thus Jove is the omnipotent being a rational person must choose from among Jove, Thor₁, Thor₂, Thor₃, . . . Compared to Jove, any Thor_N settles for a preposterously low world, one that Jove is almost certain to surpass.

Though in the original story Thor is omnipotent, we can think of each Thor_N as being finitely powerful, where N is the maximum world that Thor_N is able to create. We then see that Jove surpasses any one of these finitely powerful beings. Stephen Grover noted that if Jove is surpassed by Thor, then an odd result follows, "it is most unfortunate that God is omnipotent; if She had only been less-than-omnipotent, the world might have been a good deal better."¹⁴ However, the infinitely powerful Jove surpasses any finite being.

II. Why Has Jove's Strategy Been Underestimated?

I have argued that Jove's strategy is better than Thor's, and that Jove thereby morally surpasses Thor; however, a common view is that Jove's strategy is poor, and that Thor surpasses Jove. How has it been possible for anyone to hold this position (that Thor surpasses Jove)? I believe that there are two main answers. First, intuitions formed in finite cases have been illicitly transferred to the infinite case. Second, time plays a strange role in these deliberations which has not been properly appreciated. I discuss these answers in order.

Finite Intuitions

Rowe writes, "It is, I think, repugnant to suppose that an infinitely wise being would be reduced to having to use a randomizer to select, among worlds differing in value, the one He is to create."¹⁵ Rowe's view is widely shared.¹⁶ Why is Jove's strategy considered repugnant? I believe that a large part of the answer is that intuitions formed in finite cases are being illicitly transferred to the infinite case. Most, if not all, human dealings are with the finite. Thus our thoughts and intuitions are shaped by finite cases; however, intuitions gleaned from the finite realm do not necessarily carry over to the infinite.¹⁷ In the finite case, randomly selecting a number is a terrible strategy. That is, imagine a finite case where Jove is to select a number from 1 to 100, and imagine that Jove selects randomly. This is a terrible strategy; Jove should simply have selected 100. Though randomly selecting a number is a terrible strategy in finite cases, I hope to have demonstrated its remarkable power in the infinite case (that is, when selecting from all positive integers). I thus believe that Jove's strategy is mistakenly thought repugnant largely because Jove's strategy is repugnant in finite cases.

Jove's strategy of randomly selecting a number is so powerful that it is difficult to see how a good, omnipotent being, faced with an infinite sequence of increasingly better worlds, could select a world nonrandomly. It may be impossible to justify the strategy of selecting a particular world, as Thor does. Given that Jove surpasses each Thor_N, I do not see how one could argue that a good, omnipotent being could employ any of these Thor-strategies. Randomly selecting a number is a powerful tool in the infinite, one not wisely cast aside. Recognizing the power of Jove's strategy hopefully will dispel some of the sentiment aligned against Jove.

The Role of Time

Now let us turn to the second factor that has allowed Thor to be thought superior to Jove: time. Consider the objection that I have not done justice to the story of Jove and Thor. The objection runs as follows. Jove creates some world, J. Then let Thor be the being who creates world J + 111. Now we capture the spirit of having Jove create world 777 and Thor create world 888. Certainly there is no harm in selecting a value for J, e.g., 777. And then it is clear that Thor surpasses Jove, so the objection goes.

But Thor does not surpass Jove. Instead careful attention must be given to the strange role that time plays in these considerations. Notice in the paragraph above that Jove selects J (or 777) first, and only then

does Thor select $J + 111$ (or 888). Selecting first is a severe disadvantage for Jove. To see this, imagine two beings employing Jove's strategy. Jove_A randomly selects a positive integer before Jove_B does. Let the number that Jove_A selects be J_A . Jove_B then randomly selects a positive integer (i.e., Jove_B employs the exact same strategy as Jove_A). Following the reasoning above¹⁸ the probability that Jove_B selects a number less than or equal to J_A is infinitesimal. The probability that Jove_B selects a number greater than J_A is almost certain. Jove_B is almost certain to select a larger number than Jove_A, simply by selecting after Jove_A, even though both are employing the exact same strategy (at different times).¹⁹

Also note that if Jove selects a number *after* any other omnipotent being who employs any strategy at all, then Jove is almost certain to select a larger number. Let the world of the being who selects first be F . Jove is then almost certain to select a number larger than F . Yet as I will argue below, there are strategies that surpass Jove's. The lesson is that care must be taken when comparing omnipotent beings' strategies. Jove is at a remarkable disadvantage creating first, at a remarkable advantage creating second. Thus strategies must be compared by thinking of the strategies as being undertaken simultaneously, which I did above.²⁰

III. Is Jove Morally Unsurpassable?

Of the three questions asked in the second paragraph, the third remains, "Could a morally unsurpassable being employ Jove's strategy?" Klaas Kraay and Jesse Steinberg present similar arguments attempting to show that Jove's strategy is surpassable. Essentially, Kraay and Steinberg have a being randomly select not from all positive integers, $1, 2, 3, \dots$, but rather from a subset of the positive integers. Kraay limits the being to selecting from $2, 3, 4, \dots$. Steinberg suggests, e.g., $10001, 10002, 10003, \dots$.²¹ Intuitively, whatever world Jove creates, Kraay's being, Odin, does 1 better, and Steinberg's being outperforms Jove by 10,000.

Hyperreal numbers can be used to match these intuitions. It is possible to define the *expected value* of the number that a being is selecting from what I call the "creation set," where this set is the worlds that a being is selecting from, e.g., Odin's creation set is $\{2, 3, 4, \dots\}$. As above, we build a hyperreal number where each term is a fraction. The denominators are $1, 2, 3, \dots$. The numerators are the sum of the first n worlds in the being's creation set,²² where n corresponds to the denominator. Thus Odin's expected value is $(2/1, (2+3)/2, (2+3+4)/3, \dots) = (2, 2.5, 3, \dots)$. Jove's expected value is $(1/1, (1+2)/2, (1+2+3)/3, \dots) = (1, 1.5, 2, \dots)$.²³ We can then subtract Jove's expected value from Odin's: $(2, 2.5, 3, \dots) - (1, 1.5, 2, \dots) = (1, 1, 1, \dots)$, which is the hyperreal number identified with (equaling) 1. That is, Odin's expected value is 1 greater than Jove's. Similar considerations show that Steinberg's being's expected value is 10,000 greater than Jove's expected value.

The Howard-Snyders may reject the moves of Kraay and Steinberg based on arguments related to the partition principle. Kraay considers and rejects such a move.²⁴ I believe that the partition principle raises complex questions. I am thus uncertain whether or not Kraay and Steinberg have successfully shown that Jove is surpassable, though my belief is that they have. However, armed with the concept of expected value relating to these

beings, we can devise a strategy that far surpasses Jove's strategy. Let Sam select from worlds 2, 4, 8, 16, . . . where the n th world is given by 2 raised to the n th power. Sam's expected value is $(2/1, (2 + 4)/2, (2 + 4 + 8)/3, (2 + 4 + 8 + 16)/4, \dots)$, which is infinitely larger than Jove's expected value. That is, Sam's expected value minus Jove's expected value is an infinite number, and is one whose terms grow exponentially (recall that both Odin and Steinberg's being only bested Jove by a finite margin, e.g., 1 and 10,000, respectively). Sam is thus clearly morally better than Jove.²⁵ The intuition underlying these expected values is that any being is likely to select a number "far along" his sequence, i.e., far into the creation set. Thus beings whose creation set grows quickly (or begins higher) are more likely to select a larger number.

Jove's strategy is remarkably powerful. Jove surpasses the Thor-sequence of beings, each of whom creates a fixed world, as Jove is almost certain to outperform any Thor_N. The concern that Jove might create a "low" world, such as 777, has been overemphasized; I have indicated that the probability of this occurrence is infinitesimal. Pick any N , no matter how large, and the probability that Jove selects a number less than or equal to N is infinitesimal. Jove is almost certain to select a number greater than N . But Jove is surpassable. In particular, introducing the concept of expected value using the hyperreal numbers shows that Sam's strategy is far superior to Jove's. Sam, by turn, is surpassable, and this being is surpassable . . . Can an unsurpassable being create a surpassable world? The Howard-Snyders have not demonstrated that an unsurpassable being can create a surpassable world.

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NOTES

1. The situation may be worse still. William Rowe holds that the existence of such an unsurpassable being is logically incompatible with an unending sequence of increasingly good worlds.

2. Where I write "strategy," others have also written "procedure," "selection procedure," and "decision procedure."

3. Daniel and Frances Howard-Snyder, "How an Unsurpassable Being can Create a Surpassable World," *Faith and Philosophy* 11 (1994): 260–68; reprinted in *Philosophy of Religion: The Big Questions*, ed. E. Stump and M. Murray (Oxford: Blackwell, 1999), pp. 35–41.

4. William L. Rowe, "The Problem of No Best World," *Faith and Philosophy* 11 (1994): 269–71.

5. In order to simplify the exposition, I henceforth do away with the random device, instead having Jove randomly select a number. I often assume that Jove and Thor are vying to select a larger number; the assumption is that they would then create the corresponding world. I find that conflating numbers and worlds in this way eases the exposition. Where necessary, I write "world."

6. The case where the success set is $\{1, 2, 3, \dots, 887, 888\}$ follows the same reasoning; however, the success set $\{1, 2, 3\}$ is easier to work with.

7. Roughly speaking—I am omitting a great deal of detail, including any discussion of a nonprincipal ultrafilter and equivalence classes. For an excellent introduction to the hyperreal numbers, see Robert Goldblatt, *Lectures on the Hyperreals* (New York: Springer, 1998). The hyperreal numbers extend the real numbers. Any real number, such as 2, is identified with (equals) the constant sequence where each term of the sequence is 2, or $(2, 2, 2, \dots)$. A hyperreal number whose terms tend to 0 is an infinitesimal, such as $(1, 1/2, 1/3, 1/4, \dots)$. A hyperreal number whose terms tend to infinity is an infinite number, such as $(1, 2, 3, 4, \dots)$. Infinite hyperreal numbers appear in section III of this paper.

8. Consider the $3/5$. The denominator is 5 because the denominators simply increase by 1, and the previous denominator was 4. The numerator is 3 because 3 numbers less than or equal to 5 are in the success set, i.e., 1, 2, and 3. In the case where the success set is $\{1, 2, 3, \dots, 887, 888\}$, the first, e.g., 890 terms of the hyperreal number are $(1/1, 2/2, 3/3, \dots, 887/887, 888/888, 888/889, 888/890, \dots)$, i.e., the first 888 terms are 1, then the numerator holds at 888 from then on. This again is an infinitesimal (as the terms tend to 0), but is a larger infinitesimal than when the success set is $\{1, 2, 3\}$.

9. Any sum of finitely many infinitesimals is infinitesimal, and thus is not close to 1, which is to say that these probabilities do not appear to be countably additive. I believe that this demonstrates the poverty of limits in relation to an infinite summation of infinitesimals. Summation can be redefined in terms of multiplication by a hyperreal “counting number,” which restores countable additivity.

10. “How an Unsurpassable Being can Create a Surpassable World,” p. 260 (Jove), p. 263 (Juno).

11. There are imaginable cases where Thor might be preferred. For instance, imagine that worlds 1 to 100 are similar, and horrible, whereas worlds greater than 100 are similar, and wonderful. An argument could be made that Thor is preferable to Jove. But this example seems contrived. Assuming a roughly equal difference between worlds n and $n+1$, Jove morally surpasses Thor.

12. “The Problem of No Best World,” p. 270.

13. “How an Unsurpassable Being can Create a Surpassable World,” p. 263.

14. Stephen Grover, “This world, ‘Adams worlds’, and the best of all possible worlds,” *Religious Studies* 39 (2003): 152.

15. William L. Rowe, “Response to Hasker,” *Religious Studies* 41 (2005): 464.

16. I have encountered this view more often than not in several informal conversations on this topic.

17. Here is another example of intuitions in finite cases not transferring to the infinite case. The Howard-Snyders consider strategies other than Jove’s, and imagine Jac, who first “halves” the worlds, and then randomly selects from the worlds remaining (“How an Unsurpassable Being can Create a Surpassable World,” p. 265). But what does it mean to halve the worlds? The obvious answer, in the finite case, is to remove the lower half of the worlds. That is, if Jove were selecting from worlds 1 to 100, halving would mean removing worlds 1 to 50. But the positive integers have no lower half. Thus it is unclear exactly what to make of “halving” in the infinite case.

18. To review the reasoning, $Jove_B$ is almost certain to select a larger number than $Jove_A$ because there are only finitely many positive integers less than or equal to J_A , whereas there are infinitely many greater than J_A .

19. It also follows from these considerations that Jove, having selected a number at random, would immediately have reason to select a new number at random, reasoning that the second number would almost certainly be larger than the first. And the same reason would argue for selecting a third number to supplant the second. And so on . . .

20. Neither Jove nor Thor created first. Rather, I pointed out that Thor creates 888, and investigated the probability that Jove selects a number less than 888. Thus the strategies can be thought of as being undertaken at the same time. Also, let me mention two assumptions which form the framework within which the discussion of Jove and Thor occurs: 1) It makes sense to consider a being's selecting one from all positive integers; 2) The finite, human intellect can successfully grapple with the intentions and strategies of an infinite being. It is not clear that both of these assumptions are true. I consider the role that time plays so strange as to raise doubts regarding the truth of both 1 and 2. A further discussion of these points is beyond the scope of this paper, but see Jeremy Gwiazda, "The Train Paradox" *Philosophia* 34 (2006): 437–39 to see the author's attempt to create a paradox starting from the observation that a being who selects a number first from among all positive integers is almost certain to select a lower number than a being who selects second.

21. Klaas Kraay, "William L. Rowe's *A Priori* Argument For Atheism," *Faith and Philosophy* 22 (2005): 225–26; Jesse R. Steinberg, "Why an unsurpassable being cannot create a surpassable world," *Religious Studies* 41 (2005): 326.

22. Strictly speaking, a set is unordered, and so the creation set might be better named the "creation sequence." The creation set is to be thought of as being in increasing order.

23. Both of these expected values (hyperreal numbers) are infinite, which makes sense in that the expected values must exceed any finite number.

24. "William L. Rowe's *A Priori* Argument For Atheism," pp. 225–26.

25. Sam comes with an added benefit relative to Steinberg's being, namely, it can be shown via a probabilistic argument that Steinberg's being is merely infinitesimally likely to select a higher number than Jove. That is, Steinberg's being has a 50% + epsilon probability of outperforming Jove, and a 50% – epsilon probability of underperforming Jove. (Kraay likely would argue that the same does not hold for Odin. Odin's strategy, as defined by Kraay, is parasitic on Jove's selection of a number, namely, Odin takes Jove's number and adds 1. Thus Odin would always outperform Jove. But it is not clear that such a strategy is allowable. That is, Odin is allowed to randomly select a number and add 1, but Odin should not be allowed to, nor be assumed able to, interact with Jove.) Sam, by contrast, is almost certain to outperform Jove. There have been enough calculations in this paper, and so I spare the reader these further (straightforward, but relatively lengthy) details.