

The Impotence of the Value Pump

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Many philosophers have argued that agents must be irrational to lose out in a 'value pump' or 'money pump'. A number of different conclusions have been drawn from this claim. The 'Value Pump' (VP) has been one of the main arguments offered for the axioms of expected utility theory; it has been used to show that options cannot be incomparable or on a par; and it has been used to show that our past choices have normative significance for our subsequent choices. In this article, I argue that the fact that someone loses out in a value pump provides no reason to believe that they are irrational. The VP is impotent.

I. INTRODUCTION

Jim is deciding whether to be a flautist or a lawyer. The career as a flautist is neither better nor worse than the career as a lawyer. So, he is rationally permitted to choose either. He decides to be a flautist. Then the job centre offers to swap the career as a flautist for the legal career, except this time the salary of the legal career is £1 less. The slightly worse legal career is neither better nor worse than the career as a flautist. So, he is rationally permitted to choose either. This time, he takes the legal career. Jim has ended with an option which is worse than one he could have had earlier. Many have argued that Jim's practical loss indicts the rationality of his choices. Therefore, any theory which implies that Jim's choices are rational must be in error.

This is the 'Value Pump' argument (VP), sometimes called 'the money pump'. The argument has been used to a number of different ends. First, it is the main argument which has been advanced for some of the axioms of expected utility theory, such as transitivity, negative transitivity and completeness. Second, it has been used to attack the possibility of options being incomparable or on a par. Third, it has been used to show that past choices have normative significance. In this article, I will argue that the fact that Jim has made a practical loss does not provide any reason to believe that he is irrational. In short, the VP is impotent. In contrast, both proponents and opponents of the VP have tended to adopt a practical perspective: even those who have attacked it have done so on the basis that it is not practically problematic.¹ I

¹ See for example Philippe Mongin, 'Does Optimization Imply Rationality?', *Synthese* 124 (2000), pp. 73–111; Frederic Schick, 'Dutch Bookies and Money Pumps', *The Journal of Philosophy* 83 (1986), pp. 112–19. Two exceptions to the practical approach are John

reject the practical approach altogether.² It might be true that good non-practical arguments show that there is something in rationality which prevents people from being pumped. But we should not confuse this with the claim that the existence of practical loss provides us with any reason to alter our theories of rationality.

The article is structured as follows. Section II lays the conceptual groundwork. It explains the relation of subjective and objective value to rationality.³ Sections III and IV set out two different versions of the VP: the Incomparability Value Pump (VPⁱ) and the Uncertainty Value Pump (VP^u). In the VPⁱ, Jim has perfect knowledge of the value of the options in the choice series, but some of the options are incomparable or on a par. In the VP^u, Jim is ignorant of the value of the options. Sections V–VIII argue for the impotence of both versions of the VP. In section V, I show that suffering a bad practical result does not necessarily indict an agent's rationality. If so, it is hard to see how the proponent of the VP could show, on pragmatist grounds, that losing out in the specific conditions of the value pump series is irrational. Sections VI–VIII present an abductive argument which provides further confirmation of the impotence of the VP. Various revisions to theories of rational choice have been suggested to avoid the VP. Unless non-practical arguments are offered for these revisions, they seem ad hoc, or in other words, not supported by good reasons. The best explanation of this is that the VP does not provide us with good reasons to revise those theories. In section VI, I examine the VP^u as an argument for the impossibility of negatively intransitive orderings of options in terms of their subjective value. In section VII, I consider the VPⁱ as an argument against the possibility of parity or incomparability. In section VIII, I consider the VP as an argument for the normative importance of past choices.

Broome and Wlodek Rabinowicz. Broome rejects a practical approach in general to questions of rationality, but he does not defend his position in specific relation to the VP. Rabinowicz argues that we should assess the VP by using both practical and non-practical arguments. John Broome, 'Are Intentions Reasons? And How Should We Cope with Incommensurable Values', *Practical Rationality and Preference: Essays for David Gauthier*, ed. Christopher W. Morris and Arthur Ripstein (Cambridge, 2001), pp. 98–120; Wlodek Rabinowicz, 'Money Pump with Foresight', *Imperceptible Harms and Benefits*, ed. Michael J. Almeida (Dordrecht, 2000), pp. 123–54.

² Though I will not argue it here, I believe that much the same point applies for other practical arguments for requirements of rationality, such as the Dutch Book. For a discussion of the Dutch Book see John Broome, *Ethics out of Economics* (Cambridge, 1999), pp. 157–61. Velleman mounts a general critique of practical arguments in J. David Velleman, 'Deciding How to Decide', *Ethics and Practical Reason*, ed. Berys Gaut and Garrett Cullity (Oxford, 1997), pp. 29–52.

³ I use the term 'subjective value' – as opposed to 'expected value' – to refer to value relative to the agent's epistemic position. As I explain below, I do this because I reject some of the axioms of expected value theory.

II. THE FRAMEWORK OF THE VP

Many formulations of the VP fail to distinguish objective and subjective value. Consequently, they do not tell us whether the VP is supposed to bear on the truth of claims about objective value, subjective value, or both. I try to avoid that problem in my discussion of the VP. In this section, I will first clarify the relation of objective and subjective value to objective and subjective rationality. Second, I will explain the impact that Jim's foresight (or lack of it) of the trades that will be offered to him has on rational choice.

Objective and subjective value and rationality

The choices it is objectively rational for an agent to make depend upon what the pertinent facts are, regardless of whether the agent knows them, or could have known them, at the time of her decision. For example, it is objectively irrational for Jim to eat the poisoned apple, even if he had no way of knowing the apple was poisoned and had good reason to believe it was not. It is objectively rational for agents to perform the act with the greatest objective value. This is different from what it is subjectively rational for an agent to do. Subjective rationality depends on the agent's epistemic position. It is subjectively rational for Jim to eat the poisoned apple, given what he knew. It is subjectively rational for agents to perform the act with the greatest 'subjective value'.

It is commonly held that it is subjectively rational to maximize *expected* value. Unfortunately, standard expected value theory is inconsistent with one of my claims in this article. Expected value theory requires that orderings of options in terms of their expected value are *negatively transitive*.⁴ Negative transitivity requires that if *x* does not have greater expected value than *y* and *y* does not have greater expected value than *z*, then *x* does not have greater expected value than *z*. I will argue that the best account of rational decision theory allows that the ordering of options in terms of the value they have given our epistemic situation can be negatively intransitive. Therefore, expected value theory cannot be the correct decision theory. Indeed, it is perhaps not surprising that this is one of my conclusions because, in some form, the VP has itself been the main defence of negative transitivity and the other axioms of expected value theory, such as completeness and transitivity.⁵ Since I reject expected value theory, I will talk about 'subjective value', which is not lumbered with a commitment to negative

⁴ See Caspar Hare, 'Take the Sugar', *Analysis* 70 (2010), pp. 237–47. For a general account of the requirements of expected value theory, including negative transitivity see Martin Peterson, *An Introduction to Decision Theory* (Cambridge, 2009), ch. 5.

⁵ See Peterson, *An Introduction to Decision Theory*, ch. 8.

transitivity.⁶ The term 'subjective' may mislead. It is not about the value of an option to an agent or as it is perceived by an agent. Subjective value is value *simpliciter* relativized to the epistemic position of the agent at the time.⁷ Subjective value determines subjectively rational choice.

The ordering of options in terms of their subjective value can be negatively intransitive because the relation 'neither subjectively better nor subjectively worse than' is intransitive. However, it cannot be the case that 'equal subjective value' is an intransitive relation, because the semantics of 'equality' entail transitivity. So, I will have to introduce some novel terminology: I will say that if an option *x* is neither subjectively better nor subjectively worse than *y*, then *x* has 'correlative subjective value' to *y*.⁸ This still allows that in some cases *x* and *y* could be equally subjectively good. In my framework, all options with equal subjective value have correlative subjective value, but not all options with correlative subjective value have equal subjective value.

Since our information is usually incomplete, actions that have the highest objective value do not always have the highest subjective value. By implication, the objectively rational act is not always the subjectively rational one.

It will not be clear what the target of the VP is unless we make it clear whether the argument is about the objective or subjective value of the options. I am going to look at two different versions of the VP. The first I will call the 'Incomparability Value Pump' (VPⁱ). The VPⁱ shows that Jim can get pumped even if he has perfect knowledge of the value of the options, provided options are related by intransitive objective value relations, such as 'incomparable to' or 'on a par with'. I will call a betterness ordering with intransitive relations a 'non-standard betterness ordering'. A betterness ordering with only the transitive relations 'better than' and 'equally good' is a 'standard betterness ordering'.⁹ The second version of the VP I will call the 'Uncertainty

⁶ Oddie and Menzies refer to 'subjective value' in Graham Oddie and Peter Menzies, 'An Objectivist's Guide to Subjective Value', *Ethics* 102 (1992), pp. 512–33.

⁷ There is a difference between the evidence someone avails herself of and the evidence available to the person at the time. I find the latter more plausible as an account of what determines subjective value, though I will not argue for that here.

⁸ I believe things are perhaps more complicated than this because subjective betterness is a function of epistemic preferability and it has been plausibly argued that epistemic preferability is intransitive. See Roy Sorensen, 'Is Epistemic Preferability Transitive?', *Analysis* 41 (1981), pp. 122–3. This is not relevant to the fundamental argument of this article.

⁹ Non-standard betterness orderings are associated with non-standard or 'deviant' logics. Joseph Raz and John Broome have defended non-standard betterness orderings on the basis of the deviant logic of supervaluationism. Joseph Raz, *The Morality of Freedom* (Oxford, 1986), p. 327; John Broome, 'Is Incommensurability Vagueness?',

Value Pump' (VP^u). The VP^u shows that Jim can make subjectively rationally permissible choices and lose out in a value pump, provided that options can be ordered negatively intransitively in terms of their subjective value.

These different versions of the VP have, in some cases, not been adequately distinguished in the literature. Philosophers have sometimes talked about negatively intransitive preferences without considering whether these preferences are the product of incomparability or ignorance.¹⁰ This is an important oversight. We can know which theory of value is affected by the VP only if we distinguish the aforementioned versions of it.

Foresight

Frederic Schick has argued that if Jim has foresight, he would see what is in store for him, reject the offer of A at t_2 and thus stop the pump.¹¹ McClennan has rendered this more precise using backwards induction.¹² With foresight, we can predict what we would do at a future choice node and act accordingly to avoid a bad result. (A 'choice node' is just a single point in time at which a choice is made in a choice series, e.g. t_1 and t_2 are both choice nodes.) However, Wlodek Rabinowicz has argued that even if we have foresight, we can lose out in a modified and more complex VP, provided we are persistently given new offers.¹³

Mongin, Schick and McClennan attack the VP on the basis that it does not have the practical import many have thought.¹⁴ The central point of this article, on the other hand, is that practical consequences are irrelevant to the assessment of an agent's rationality. So, I will assume that agents do not have foresight and that they do get pumped. We can then look at whether this matters for their rationality.

Incommensurability, Incomparability, and Practical Reasoning, ed. Ruth Chang (Cambridge, Mass. and London, 1997), pp. 67–89.

¹⁰ Davidson et al. initially formulated the VP as an argument about preferences. See Donald Davidson, J. C. C. McKinsey, and Patrick Suppes, 'Outlines of a Formal Theory of Value, I', *Philosophy of Science* 22 (1955), pp. 140–60. I discuss the preference versions in more depth in section IV.

¹¹ Schick, 'Dutch Bookies and Money Pumps', pp. 117–18. We should be careful to distinguish this from Schick's claim that past choices should determine the value of the options at subsequent choice nodes. At p. 117 he denies the assumption that 'if the agent knew of the arrangements he had already accepted, this would not affect the value he set on the arrangement just offered him'. See also Mongin, 'Does Optimization Imply Rationality?'.

¹² Edward F. McClennan, *Rationality and Dynamic Choice: Foundational Explorations* (Cambridge, 1990).

¹³ Rabinowicz, 'Money Pump with Foresight'.

¹⁴ Mongin grants that we can lose out in a value pump with only a few choice nodes. However, he says that foresight can allow us to avoid severe practical loss, like bankruptcy, which he equates with complete irrationality. Mongin, 'Does Optimization Imply Rationality?', pp. 84–6.

The 'no foresight' assumption has a bearing on whether my versions of the VP are concerned with subjectively rational choice or objectively rational choice. Foresight is a feature of Jim's epistemic position and so has no bearing on what he is objectively rationally permitted to do. Since I am leaving it open that Jim's lack of foresight bears on what he is rationally permitted to do, my two versions of the VP are about subjective, not objective, rationality. If foresight would not protect Jim from loss, then my discussion of the VP^i applies by implication to objectively rational choice as well. Even though neither version mentions objectively rational choice, I can still draw conclusions about the objective *value* of options by assuming that Jim has perfect epistemic access to the value of the options. If Jim has perfect knowledge of the value of the options, then the objective value of the options equals the subjective value of the options. For instance, if Jim has perfect knowledge of the objective value of A+ and B and these options have equal objective value, then A+ and B have correlative subjective value. Therefore, by assuming that Jim has perfect knowledge of the objective value of the options, one can infer from claims about objective value to claims about subjectively rational choice and vice versa.

III. THE INCOMPARABILITY VALUE PUMP

I will now set out to explain each premise of the VP^i in turn.¹⁵ When I use 'permissibility' or 'ought' in what follows I am referring to the subjectively rational senses of *permissibility* and *ought*.

Premise 1ⁱ: choice between incomparable options

' $x >^0 y$ ' denotes that x is objectively better than y. ' $x =^0 y$ ' denotes that x and y are objectively equally good. ' $x \sim^0 y$ ' denotes that x is objectively on a par with y or objectively incomparable to y. ' $P_t(x)$ ' denotes that Jim is rationally permitted to choose option x at time t. 'EA' denotes that Jim has perfect epistemic access to the value of the options over the course of the series of choices. Premise 1 of the VP^i goes as follows:

- 1ⁱ. In a pairwise choice only between options x and y at t and where the agent lacks foresight of future trades that will be offered:
 - (a) If $((EA) \wedge (x >^0 y))$, then $P_t(x) \wedge \neg P_t(y)$.
 - (b) If $((EA) \wedge (x =^0 y))$, then $P_t(x) \wedge P_t(y)$.
 - (c) If $((EA) \wedge (x \sim^0 y))$, then $P_t(x) \wedge P_t(y)$.

¹⁵ My formulation owes much to Martin Peterson, 'Parity, Clumpiness and Rational Choice', *Utilitas* 19 (2007), pp. 505–13.

1ⁱ infers from objective value to rational permissibility. The subjective value of options equals the objective value of the options when the agent has perfect knowledge of the value of the options. For instance, if EA and $x >^o y$, then x is subjectively better than y . Thus, it is subjectively rational to choose x . The premise is still only about subjectively rational permissibility because Jim lacks foresight. If the agent has foresight of future trades, 1ⁱ(a), (b) and (c) might all be false. What he is required to do if he has foresight depends on what is the correct ‘choice strategy’.¹⁶ At t_1 , given the available evidence, Jim has no reason to believe he will be offered future trades, so the value of x and y is all that should concern him.

Premise 2ⁱ: incomparability

Premise 2 of the VPⁱ is about the ranking of three options in terms of their objective value.

- 2ⁱ. For three options, A^+ , A and B from t_n to t_{n+m} for all $m \geq 1$, if a choice is made at each choice node in the series:
- (a) $A \sim^o B$
 - (b) $A^+ \sim^o B$
 - (c) $A^+ >^o A$

A is objectively incomparable with B ; A^+ is objectively incomparable with B ; and A^+ is objectively better than A . Negative intransitivity is possible because of the intransitivity of incomparability and parity. 2ⁱ states that the value of the options stays constant over time. This is because, as I will show in section VIII, some philosophers argue that the objective value of the options can alter over time by virtue of the fact that an agent chose them earlier in the series.

Premise 3ⁱ: practical loss

Premise 3 of both versions of the VP makes a claim about what choices agents are permitted to make at different points in time. This is the incomparability version.

- 3ⁱ. If $(EA \wedge (P_{tn}(x)) \wedge (y <^o x))$, then $\neg P_{tn+m}(y)$ for all $m \geq 1$.

In words, 3ⁱ says that where agents have perfect epistemic access to the value of options, they are not permitted to end up with an option that is objectively worse than one they could have had earlier in the series. We are now in a position to prove the following theorem:

Theorem – Premises 1ⁱ, 2ⁱ and 3ⁱ are logically inconsistent.

¹⁶ For the alternatives see Rabinowicz, ‘Money Pump with Foresight’; and McClennen, *Rationality and Dynamic Choice*.

Proof – Assume that Jim has perfect epistemic access to the value of the options. Suppose for *reductio* that 2^i is true. Let t_1 and t_2 be two points in time and suppose that Jim is offered a choice between A^+ and B at t_1 , and between B and A at t_2 . Premise 1^i implies that $P_{t_1}(B)$ in the choice between A^+ and B , since $A^+ \sim^0 B$. Now consider the choice made at t_2 . 1^i implies that $P_{t_2}(A)$, since $A \sim^0 B$. However, since $P_{t_1}(A^+)$ and $A^+ >^0 A$, premise 3^i implies that $\neg P_{t_2}(A)$.

One of the premises of the argument must be false. We need to be careful to separate the issue of what the premises *logically imply* from the issue of whether any of the premises provide any *reason to believe* that the other premises are false. I will argue that 3^i does not provide reason to believe that 1^i and/or 2^i are false. However, I also believe that 3^i is true and, along with 1^i , implies that 2^i is false.

IV. THE UNCERTAINTY VALUE PUMP

I now turn to the Uncertainty Value Pump (VP^u).

Premise 1^u : choice under uncertainty

Premise 1 of the VP^u relates subjective value and rational permissibility. ' $x >^s y$ ' denotes that x is subjectively better than y . ' $x \#^s y$ ' denotes that x and y have correlative subjective value.

- 1^u . In a pairwise choice only between options x and y at time t and where the agent lacks foresight of future trades that will be offered:
- (a) If $x >^s y$, then $P_t(x) \wedge \neg P_t(y)$.
 - (b) If $x \#^s y$, then $P_t(x) \wedge P_t(y)$.

Premise 2^u :

Premise 2^u is about the rankings of options in terms of their subjective value.

- 2^u . For three options, A^+ , A and B at t_n and t_{n+m} for all $m \geq 1$, if a choice is made at each choice node in the series:
- (a) $A \#^s B$
 - (b) $A^+ \#^s B$
 - (c) $A^+ >^s A$

The ranking of these options in terms of their subjective value is negatively intransitive. This is a product of the intransitivity of correlative subjective value.

Premise 3 and the remainder of the VP^u

Premise 3 of the VP^u makes a claim about which choices agents are rationally permitted to make at different points in time:

3^u. If $(P_{t_n}(x) \wedge (y <^s x))$, then $\neg P_{t_n+m}(y)$ for all $m \geq 1$.

3^u says we are not permitted to end up with an option which is subjectively worse than one we could have had at an earlier point in the series. We are now in a position to prove the following theorem:

Theorem – Premises 1^u, 2^u and 3^u are logically inconsistent.

Proof – Suppose for *reductio* that 2^u is true. Let t_1 and t_2 be two points in time and suppose that the agent is offered a choice between A⁺ and B at t_1 , and between B and A at t_2 . Premise 1^u implies that $P_{t_1}(B)$ in the choice between A⁺ and B, since $A^+ \#^s B$. Now consider the choice made at t_2 . 1^u implies that $P_{t_2}(A)$, since $A \#^s B$. However, since $P_{t_1}(A^+)$ and $A^+ >^s A$, 3^u implies that $\neg P_{t_2}(A)$.

1^u, 2^u and 3^u are inconsistent. One of them must be false. My position on the VP^u is different from my position on the VPⁱ. As before, I argue that 3^u does not provide reason to believe that 1^u and/or 2^u are false. However, this time, I argue that there is good reason to believe that 2^u can be true.

A note on preferences

Before I critique these arguments, a note on preferences. The VP has often been presented as an argument about the rationality of preferences. The preference version of the argument can be inferred from both of these arguments. This is because the subjective value of the options determines the preferences it is subjectively rational to have; and the objective value of the options determines the preferences it is objectively rational to have.¹⁷ So, for example, the preference version of the VP^u would say that Jim ought to be indifferent between A⁺ and B because they have correlative subjective value. So, he may choose either. He chooses B. Then, he is offered to swap A for B. He ought to be indifferent between A and B, so he may choose either. He chooses A. All we need for the preference version of the Value Pump to get going is

¹⁷ Duncan MacIntosh defends the rationality of losing out in a value pump, but appeals solely to Jim's preferences, rather than to the value of the options his preferences are directed towards. Consequently, his argument is unpersuasive. Duncan MacIntosh, 'Intransitive Preferences, Vagueness, and the Structure of Procrastination', *The Thief of Time*, ed. Chrisoula Andreou and Mark D. White (New York and Oxford, 2010), pp. 68–86.

for preferences to be negatively intransitive, which is what rationality requires if options are ranked as specified by 2^u and 2^i .¹⁸ If the VP is the wrong way to determine the subjective or objective value of options, then it is the wrong way to determine the rationality of preferences.

V. BAD PRACTICAL RESULTS DO NOT ALWAYS INDICT RATIONALITY

The VP is a practical argument.¹⁹ According to its proponents, the fact that someone has made a practical loss in a value pump provides sufficient reason to believe that they are irrational.²⁰ The first thing to say is that it is at least not obvious that it does provide us with reasons. Proponents of the VP must explain rather than assume their position, but they have yet to do so. In the remainder of this section, I will argue that there is good reason to believe that the VP does not provide us with reasons, because in other cases practical arguments clearly do not provide us with reasons to believe that people are irrational.

In what follows I will refer only to the VP^i , but my argument also applies to the VP^u . There are various cases in which rational choices leave us worse off than we could have been had we chosen differently. Consider the following choice series, which I will call 'Lucky D'. Suppose that options are ranked in the following way:

- $2'$. For four options C, D, E and F at t_n and t_{n+m} for all $m \geq 1$, if a choice is made at each choice node in the series:
- (a) $C =^o D =^o F$
 - (b) $E >^o (C \wedge D \wedge F)$

¹⁸ Philosophers disagree about the preference-attitudes we ought to have between incomparable options. I believe, along with John Broome, that we ought to be indifferent because neither option is better and our attitudes ought to respond to value. Most philosophers who have stated an opinion disagree. They believe that we ought to prefer neither of two incomparable options to the other, but that we also ought not to be indifferent between them. Nonetheless, they agree that it can be rational to have negatively intransitive preferences as a result of incomparability. See Broome, *Ethics out of Economics*, p. 155; Wlodek Rabinowicz, 'Value Relations', *Theoria* 74 (2008), pp. 18–49, at 25–30; Ruth Chang, 'The Possibility of Parity', *Ethics* 112 (2002), pp. 659–88, at 666; Johan E. Gustafsson and Nicolas Espinoza, 'Conflicting Reasons in the Small-Improvement Argument', *The Philosophical Quarterly* 60 (2010), pp. 754–63; Joseph Raz, *The Morality of Freedom* (Oxford, 1986), pp. 333–5; Martijn Boot, 'Parity, Incomparability and Rationally Justified Choice', *Philosophical Studies* 146 (2009), pp. 75–92.

¹⁹ When I refer to the VP simpliciter I am referring to both versions of that argument for the sake of simplicity.

²⁰ See for example Davidson et al., 'Outlines of a Formal Theory of Value, I'; Peterson, 'Parity, Clumpiness and Rational Choice'; Ruth Chang, 'Parity, Interval Value, and Choice', *Ethics* 115 (2005), pp. 331–50; Howard Raiffa, *Decision Analysis: Introductory Lectures on Choices under Uncertainty* (Boston, Mass., 1970), pp. 75–80.

Suppose Jim has perfect epistemic access to the value of the options and is offered C and D at t_1 , but unbeknownst to him he will be offered E at t_2 only if he chooses D at t_1 , and he will be offered F at t_2 only if he chooses C at t_1 . Jim is permitted to choose C or D at t_1 . If he chooses D, then he is only rationally permitted to end up with E, which is better than all of the other options. Choosing D and then E is the best route from the practical point of view. Now suppose that there is a pragmatist who says that this provides us with reason to believe that it would be irrational to choose C at t_1 . As a result of choosing C, Jim has ended up worse than he could have been and therefore he is irrational.

Clearly, Jim is not irrational to choose C at t_1 , so the pragmatist must be wrong. To prove that Jim is not irrational, we would argue as follows. Options can obviously be ordered as set out by 2' and since Jim did not know that he would be offered E only if he chose D, he had no reason to choose D over C. So, he is rationally permitted to choose C and end up with C or F. It is true that if he were only permitted to choose D at t_1 , then he would get a better practical outcome, but this has no bearing whatsoever on whether he is rational or not. An examination of 1ⁱ and 2' *abstract the practical consequences* shows that Jim is not irrational to choose C at t_1 . This shows that the existence of a bad practical outcome alone does not provide reason to believe that someone is irrational. Therefore, pointing only to the bad practical result in the value pump does not provide us with sufficient reason to believe that Jim is irrational. This is an important result. As I have said, proponents of the VP usually simply assume that a bad practical result entails irrationality. They are not entitled to this assumption.

It might be argued that the existence of a bad practical result in the particular conditions of the value pump series provides reason to believe that Jim is irrational. I have two comments on this.

First, this claim can only be defended by appealing to non-practical arguments. The practical considerations unequivocally count against the rationality of choosing C at t_1 , just as the practical considerations count against the rationality of getting pumped. So, we need a non-practical argument to explain why losing out is irrational in one case but not the other. The VP cannot be a free-standing practical argument.

Second, the non-practical argument for the irrationality of getting pumped cannot appeal to the prior falsity of 1ⁱ and/or 2ⁱ. 3ⁱ is not merely supposed to imply the falsity of 1ⁱ and/or 2ⁱ; it is supposed to provide reasons to believe that at least one of those premises is false. If the case for 3ⁱ rested on the prior case for the falsity of 1ⁱ and/or 2ⁱ, then 3ⁱ would not provide reason to reject those premises, even if it implies their falsity. A non-practical argument against 1ⁱ and/or 2ⁱ is not open to the pragmatist proponent of 3ⁱ. I conjecture that people are persuaded that

the VPⁱ is not impotent because they are already suspicious of the truth of 1ⁱ and 2ⁱ on non-practical grounds. But we should not confuse our antecedent non-practical suspicions about 1ⁱ and 2ⁱ with the claim that practical costs provide us with reasons to reject those premises.²¹

In response, it might be argued that the difference between the VP and Lucky D is that the non-practical arguments for the rationality of choosing C in Lucky D are obviously compelling, whereas the non-practical arguments for the rationality of ending up with A in the VP are not as compelling. It might be that practical considerations start mattering when, in light of the non-practical arguments, we are agnostic between different formulations of 1ⁱ and/or 2ⁱ, some of which imply that Jim may rationally get pumped and some of which do not. Two things may be said in response. First, on this approach, the VP alone is insufficient to show that we have reason to believe that it is irrational to get pumped. The proponent of the VP must show not only that the non-practical arguments for 1ⁱ and 2ⁱ leave us agnostic but also that practical arguments start mattering when the non-practical arguments leave us agnostic. No proponent of the VP has yet done either of these things. Moreover, I have yet to find a set of non-practical arguments which leave us agnostic between different formulations of 1ⁱ and 2ⁱ. The arguments are of course complex, but they always seem to me, in principle, not to lead us to agnosticism, but rather towards single versions of 1ⁱ and 2ⁱ. Second, if we did accept a particular formulation of 1ⁱ and/or 2ⁱ for pragmatic reasons and we would otherwise be agnostic between different formulations in light of the non-practical arguments, we would be accepting non-practical defects in our theory of rationality. My abductive argument in sections VI–VIII shows that accepting non-practical defects for the sake of practical benefits always seems *ad hoc*. Thus, even if the non-practical arguments leave us agnostic, as I will try to show in the remainder of the article, there are very strong abductive reasons to believe that pragmatic considerations would not provide us with reasons to stop being agnostic.

The arguments in this section, if sound, imply that there is already good reason to believe that the VP is impotent.

VI. TRANSITIVITY, UNCERTAINTY AND PRACTICAL LOSS

In the next three sections, I will present the abductive argument against the VP. The VP is an open-ended argument in the sense that it tells us we must alter some part of 1 and/or 2, but it does not tell us which part. There are various alterations, many of them obviously *ad hoc*, which we could make to these premises so that they do not entail

²¹ The same applies to the VP^u.

that Jim may be rational and get pumped. For example, we could reject 1 and say that God commands that we may not pick A at t_2 and we are rationally required to do what God commands. This is obviously unacceptable. The point is that if the VP does provide us with reasons to change premises 1 and/or 2, other arguments are required to tell us precisely which part of 1 and/or 2 must be changed.

In this section I will consider the VP^u as an argument for the transitivity of correlative subjective value. If correlative subjective value were transitive, then we would not be able to lose out in a value pump series. For example, if A+ and B have correlative subjective value and A+ is subjectively better than A, then B must be subjectively better than A. Therefore, in a choice between A and B at t_2 , we are not permitted to choose A. The same goes for intransitive objective value relations, like 'incomparable to'. Therefore, there are good pragmatic reasons for subjective and objective value relations to be transitive. I will reject this argument in this section and the next.

The intransitivity of correlative subjective value

I will argue that 2^u is true and that an examination of the argument which shows this provides some initial confirmation for my abductive argument that the VP^u does not provide us with reasons to reject 1^u or 2^u .

Persuasive non-practical arguments show that correlative subjective value is intransitive and therefore that orderings of options in terms of their subjective value can be negatively intransitive.²² Suppose Sally has to choose between going to an Indian restaurant and a Chinese restaurant.²³ Both restaurants only offer a two-course set menu for £18 and these menus vary from week to week. Sally has been to both restaurants before and she has no reason to think that either will be objectively better, simply because she has not yet eaten the particular meals on offer that evening. (This allows there to be a truth of the matter about which meal would be objectively better.) Given Sally's epistemic situation, the restaurants have correlative subjective value, so she should be indifferent between them. To bracket the issue of the normative significance of past choices or intentions, assume that she does not make a choice. Now suppose Sally finds out that the Chinese has put up prices. Their set menu now costs £18.01. This change seems too insignificant to make it the case that Sally rationally ought to

²² See Miriam Schoenfield, 'Chilling out on Epistemic Rationality', *Philosophical Studies* 158 (2012), pp. 197–219. Roy Sorensen presents another argument for intransitive correlative subjective value, which seems irrefutable. See Roy Sorensen, 'Subjective Probability and Indifference', *Analysis* 43 (1983), p. 15.

²³ This example is owed to Caspar Hare. See Hare, 'Take the Sugar', p. 238.

choose the Indian restaurant. Sally should be indifferent between the Indian and the slightly worse Chinese, but prefer the original Chinese to the worse Chinese. Therefore, the restaurants are ordered negatively intransitively in terms of their subjective value.

Examples like these are legion in recent discussions of comparability. Indeed, there is widespread agreement among philosophers who have considered the Small Improvements Argument (SIA) on the possibility of negatively intransitive orderings of options in terms of their subjective value. The argument above is a variant of an SIA. It can plausibly be explained by Sally's epistemic deficit. But many philosophers argue that the SIA shows that sometimes the trichotomy of objective value relations 'better than', 'worse than' and 'as good as' does not apply between two options. Incomparabilists, like Broome and Raz, and proponents of a tetrachotomy of value relations, like Chang, argue that it is possible for options to be negatively intransitively ordered in terms of their objective value. This implies it is possible for options to be ordered negatively intransitively in terms of their *subjective* value, because subjective value equals objective value if an agent has perfect knowledge of the value of the options. Indeed, if it were true that the VP^u showed that options could not be ranked negatively intransitively in terms of their subjective value and if, as seems plausible, some SIAs exploit borderline cases of vague predicates, then the VP^u would have shown by implication that supervaluationism and all non-epistemicist theories of vagueness are false.²⁴ No theorist of vagueness has yet thought that the VP^u even bears on the truth of his or her theory. It might do, but significant further argument is required to show that it does.

The epistemicist theory of vagueness might be thought to offer a way out of this. If some SIAs exploit borderline cases of vague predicates and epistemicism is true, then there seems to be room for an account which says that the betterness ordering is standard.²⁵ It might be thought that this implies that the epistemicist at least must accept that options cannot be ordered negatively intransitively in terms of their subjective value. Since epistemicism is a respectable theory of vagueness, a respectable theory rules out the possibility of negatively

²⁴ Ruth Chang has argued that SIAs do not exploit borderline cases of vague predicates. I do not find her argument persuasive, but even if it is, Chang's argument still implies that options can be ordered negatively intransitively in terms of their subjective value. See Chang, 'The Possibility of Parity'.

²⁵ A complete account of epistemicist comparabilism has yet to be provided in the literature. Broome discusses epistemicist accounts at Broome, *Ethics out of Economics*, p. 152. For defences of epistemicism see Timothy Williamson, *Vagueness* (London, 1994); Roy A. Sorensen, 'Vagueness, Measurement, and Blurriness', *Synthese* 75 (1988), pp. 45–82.

intransitive orderings in terms of their subjective value. This is not correct. The epistemicist diagnosis of small improvements cases is that proponents of non-standard betterness orderings confuse our ignorance of a ranking with the lack of a ranking. That is, they confuse negatively intransitive orderings of options in terms of their *objective* value with negatively intransitive orderings of options in terms of their *subjective* value. It is this diagnosis which allows epistemicists to account for the phenomena in small improvements cases without granting that the betterness ordering is non-standard. Thus, negatively intransitive orderings of options in terms of their subjective value are accepted across the spectrum among those who have considered the SIA: from incomparabilists to proponents of a tetrachotomy of value relations to epistemicist comparabilists, like myself.

Initial confirmation of the abductive argument

My argument up until now serves two functions. First, it establishes that correlative subjective value is intransitive. If the other parts of 1^u and 2^u can be defended, then 3^u must be false. Second, an analysis of the argument for intransitive correlative subjective value provides initial support for my abductive argument. Practical arguments seem to be intuitively irrelevant to the assessment of arguments like the one above for correlative subjective value. The case for intransitive correlative subjective value is so clear that if it can be shown that it commits us to incurring practical costs, then we must accept those costs. Similarly, the claim in $2^u(c)$ that ' $A+ >^s A$ ' is just a brute fact to which we must adjust our theories of rational decision. We could avoid practical loss by denying that conjunct of 2^u , but there are good non-practical arguments against doing so. The same holds for arguments for the other conjuncts of 2^u . Any change to that premise recommended solely on practical grounds looks ad hoc. The best explanation for this is that the VP^u does not provide us with reasons to change premise 2.

One possible response to the abductive argument is that the revisions only *seem* ad hoc and that we cannot infer from this that the VP^u does not provide us with reasons since the revisions might seem ad hoc, but not be ad hoc. My reply is that it is hard to see why we would be incapable of intuitively recognizing the reasons the VP^u provides, even after close examination of the arguments. It is hard to see why we would always have the intuition that a particular change is not recommended for good reasons, even though there are good reasons. This does not deductively prove that the VP^u does not provide good reasons, but by far the best explanation of it is that the VP^u does not provide us with good reasons.

Many proponents of the VP implicitly accept that practical considerations should give way in the face of good non-practical

arguments. For example, Martin Peterson rules out the denial of the principle of irrelevant alternatives as a solution to the VP, calling it ‘metaphysically odd’, and rules out Chang’s claim that there are different senses of rational permissibility calling it ‘ad hoc’.²⁶ He infers from this and the VP that options cannot be incomparable or on a par. But what if denying the possibility of incomparability or parity is just as metaphysically odd or ad hoc as denying the principle of irrelevant alternatives? If metaphysical oddness or ad hocness is sufficient reason to reject a proposed solution to the VP, then it should be sufficient reason to reject other proposed solutions to the VP. Peterson neglects this possibility and so does not consider the possibility that the VP does not provide us with reasons. When Peterson says that Chang’s solution to the VP is ad hoc, he means that it is ad hoc for non-practical reasons. This is instructive. First, if he thought that the denial of parity were ad hoc on a non-practical basis, then, by consistency, he would have to accept that the VP is unsound. Second, the fact that the revision seems ad hoc provides confirmation for my abductive argument that the VP is impotent.

My arguments here are, if sound, bad news for expected value theory. First, I have provided some initial confirmation for my abductive argument that the VP^u does not provide reason to reject either premise 1^u or premise 2^u. Since the VP has been the main argument offered for the axioms of expected value theory, this is troubling. Second, there are very strong and widely accepted arguments which imply that options can be ordered negatively intransitively in terms of their subjective value. This implies that expected value theory is incorrect.²⁷

VII. PRACTICAL LOSS AND NON-STANDARD BETTERNESS

Recall 3ⁱ:

3ⁱ. If $(EA \wedge (P_{tn}(x)) \wedge (y <^o x))$, then $\neg P_{tn+m}(y)$ for all $m \geq 1$.

The discussion of 3^u can be adapted for 3ⁱ. 3ⁱ avoids some criticisms of 3^u but does not avoid others. Any rejection of transitive objective value relations looks ad hoc in the absence of non-practical support. This provides support for my abductive argument. However, in my view, 3ⁱ is true and, along with 1ⁱ, implies that 2ⁱ is false.

For the reasons given in section VI, there is very good reason to doubt that 3ⁱ provides us with reasons to reject 1ⁱ and 2ⁱ. It is difficult to see why pragmatic considerations would bear on the evaluative properties

²⁶ Peterson, ‘Parity, Clumpiness and Rational Choice’, pp. 511–12.

²⁷ For a discussion of an alternative see Hare, ‘Take the Sugar’.

of different options. All non-epistemicist theories of vagueness imply that options are incomparable in borderline cases of the trichotomy of the comparative predicates 'better than', 'worse than' and 'as good as', which are exploited in some SIAs. If the VP^i provides reason to reject 1^i or 2^i and the other parts of 1^i and 2^i are true, then the VP^i provides reason to believe that all non-epistemicist theories of vagueness are false. If this were true, it would be very surprising. As I said in section VI, no theorist of vagueness has yet thought the VP^i an appropriate way to assess theories of vagueness. Practical considerations just seem to be irrelevant to the matter at hand. If they conflict with the best non-practical arguments about vagueness, then the practical considerations have to give way.

The difference between 2^u and 2^i is, in my view, that the best non-practical arguments count against 2^i . I make no attempt to argue for my position here, but I believe that the objective betterness ordering is standard. If it is and EA is true, then Jim cannot lose out in a value pump, so 3^i must be true.

In my view, 3^i is true, 1^i is true and this implies that 2^i is false. It might be thought in light of this that I must believe that the VP^i provides reason to believe that 2^i is false. This is not correct. We should believe 3^i only once we already believe that the betterness ordering is standard. In other words, we should believe 3^i only once we already believe that 2^i cannot be true. Therefore, the VP^i does not provide any additional reason to believe that 2^i cannot be true. As a critique of non-standard betterness orderings, the VP^i takes us nowhere.²⁸

VIII. THE NORMATIVE IMPORTANCE OF PAST CHOICES

For the sake of simplicity, I will refer only to the VP^i in the remainder of this section, though we can substitute the VP^u and my argument would be unaffected. It is possible to accept both that value relations are intransitive and that 3^i is true. One way to do this is by arguing that our past choices have normative significance for our subsequent choices. There are two possible ways in which past choices might have normative significance. First, it might be argued that 2^i is false because an agent's past choice of an option adds value to that option at subsequent choice nodes. Second, it might be argued that 1^i is false because it is sometimes the case that we are rationally permitted to choose only one of two incomparable options.²⁹ I will reject the potential justification of either of these moves by the VP^i .

²⁸ Compare Peterson, 'Parity, Clumpiness and Rational Choice'.

²⁹ As I will show below, it is not clear which of these two approaches Chang favours given what she says about the VP. See Chang, 'Parity, Interval Value, and Choice', p. 347;

Past choices add value

It might be argued that choosing an option at one choice node adds value to that option at subsequent choice nodes. One might endorse what I call the ‘Past Choices’ principle:

Past Choices (PC): For some option x , in a choice only between x and y , if an agent chooses x rather than y at t_1 , then x has more value (for that agent) at t_{1+n} for all $n \geq 1$.

‘For the agent’ is in brackets because on some possible defences of PC, the option only has additional value at subsequent choice nodes relative to the choosing agent in particular, but not for other agents. Ruth Chang could be interpreted to be endorsing PC in the following passage:

When you have sufficient reason to choose either x or y , you can justifiably pick either. Suppose you pick y . Your choice of y is justified even though you don’t have most reason to choose it. Now suppose you are faced with a choice between y and x -minus, only slightly less choiceworthy than x . Again you have sufficient reason to choose y or x -minus. But given that you have previously chosen y , you now, arguably, have most reason to choose y over x -minus — if you had sufficient reason to choose x -minus given your previous choice of y , you could be money-pumped. By picking, then, it seems you can change what you subsequently have most reason to do.³⁰

The ‘then’ in the last sentence is like ‘therefore’: Chang takes the fact that PC allows people to avoid getting pumped to be a sufficient reason to change a theory of rational decision. She says that having chosen y at t_1 , we have ‘most reason’ to choose y over x -minus at t_2 . Elsewhere, she says that there is an isomorphism between reasons and value: ‘If an alternative has some value, then there will be a corresponding reason, and if there is a reason to choose an alternative, then there will be a corresponding value it bears.’³¹ If we have more reason to choose y than x -minus at t_2 and there is an isomorphism between reasons and value, then y must have more value than x at t_2 , i.e. y must be better than x at t_2 . Thus, Chang can plausibly be interpreted as endorsing PC.³² PC

Ruth Chang, ‘Voluntarist Reasons and the Sources of Normativity’, *Reasons for Action*, ed. David Sobel and Steven Wall (Cambridge, 2009), pp. 264–5.

³⁰ Chang, ‘Voluntarist Reasons and the Sources of Normativity’, p. 264.

³¹ Ruth Chang, ‘Are Hard Choices Cases of Incomparability?’, *Philosophical Issues* 22 (2012), pp. 106–26, at 115.

³² In her discussions of the VP, Chang says that she believes PC solely on the basis of the VP. The reasons created in a choice series are not the ‘voluntarist reasons’ she defends in other places. See Chang, ‘Voluntarist Reasons and the Sources of Normativity’, p. 264. See also Ruth Chang, ‘Grounding Practical Normativity: Going Hybrid’, *Philosophical Studies* 164 (2013), pp. 163–87.

implies that 2^i is false because it implies that if B is chosen at t_1 , then it is better than, as opposed to incomparable to or on a par with, A at t_2 . PC entails that Jim can rationally avoid getting pumped because he is not rationally permitted to choose A at t_2 .³³

The problems with this argument provide further confirmation for my abductive argument. Non-practical considerations count against PC, and the practical downsides of the denial of PC seem to be irrelevant to the assessment of whether it is true or not.

PC is subject to a variation of Michael Bratman's 'bootstrapping objection'.³⁴ Suppose that Jim faces a choice between A and B at t_1 and chooses B. Given PC, at t_2 B is better than A, for Jim. Note that Jim's choice of B does not make just a small improvement to B. B and A are not on an unstable knife-edge in terms of value: they are in a zone of parity, not at a single point of equal value. So, a minute improvement to B cannot be enough to make it better than A; the improvement must be reasonably large. Now, there must be some improved version of A, A^* , which for Jim is on a par with B at t_2 . If Jim is offered B and A^* , he may permissibly choose B. He does so. This adds value to B for Jim, again. We can iterate this cycle of choices indefinitely. Merely by choosing B over and over again, B becomes a source of enormous value for Jim. And yet it is still humble old B; all that's happened is that Jim has chosen it over and over again. Imagine B is a career as a lawyer. PC implies that just by choosing the same career as a lawyer over and over again, it is better for Jim than a career as a clarinetist + £1 billion. This is true even though it is obvious that he should choose the career as a clarinetist. We should not accept this implication of PC. Therefore, we should not accept PC.³⁵

There are good non-practical reasons to reject PC. The mere fact that it saves people from getting pumped does not provide reason to accept it: it simply seems ad hoc. The fact that it does provides further confirmation for my abductive argument. Moreover, from the practical point of view, PC is very desirable. If it were true, there would be potentially enormous practical benefits. If practical arguments provide us with reasons, then it seems as though the stronger the practical

³³ Chang says that the VP is a problem for incomparability, but not for parity at Chang, 'Grounding Practical Normativity', p. 124 n. 11. But it is not clear what precludes an incomparabilist from appealing to exactly the same considerations about the normative importance of past choices as the proponent of parity.

³⁴ Michael E. Bratman, *Intention, Plans, and Practical Reason* (Cambridge, Mass. and London, 1999), pp. 23–7.

³⁵ Chang argues that her account of hybrid voluntarism, which is very similar to PC, avoids the bootstrapping problem. Chang, 'Grounding Practical Normativity', pp. 183–4. However, she does not consider this modified form of the bootstrapping problem. It is also not clear that Chang avoids the original bootstrapping problem either.

advantages of a theory if it were true, the stronger reason we would have to believe it to be true. And yet we have no reason at all to accept PC or other false theories which would have large practical benefits if they were true. The best explanation of this is that *no* practical arguments provide us with reasons. Chang herself evidently does not take the VPⁱ to be good reason to reject the possibility of parity because of what she takes to be the good non-practical arguments in favour of parity. But she does not consider the non-practical defects of PC, and so she does not consider the possibility that the VP does not give us reason to accept these defects, just as, in her view, it does not give us reason to reject parity.

Rationality and value

The second way to make past choices have normative significance would be to deny 1ⁱ(c):³⁶

- 1ⁱ. In a pairwise choice only between options x and y at t and where the agent lacks foresight of future trades that will be offered:
- (a) If $((EA) \wedge (x >^o y))$, then $P_t(x) \wedge \neg P_t(y)$.
 - (b) If $((EA) \wedge (x =^o y))$, then $P_t(x) \wedge P_t(y)$.
 - (c) If $((EA) \wedge (x \sim^o y))$, then $P_t(x) \wedge P_t(y)$.

Chang could be interpreted to be arguing that by virtue of our choice of B at t_1 rationality constrains us from picking A at t_2 , even though A and B are incomparable or on a par at t_2 . Once again, Chang's proposal looks ad hoc in spite of its practical benefits. This completes the cumulative case for my claim that the VP does not provide us with reasons to reject premises 1 and 2.

In her 'Parity, Internal Value and Choice', Chang sets out the VP and then says:

The rational permissibility of choosing either of two items on a par, then, must be constrained by one's other choices. If one chose B when offered a choice between A+ and B, one is thereby rationally prohibited from choosing A when offered a choice between B and A. This is true even though there is a sense in which because B and A are on a par, it is rationally permissible to choose either.³⁷

As before, the 'then' in the first sentence is like 'therefore': Chang takes the VP to be the sole reason justifying the claims she goes on to make. First, she suggests that even though A and B are on a par, Jim is rationally required to choose B. Second, she suggests that there are different senses of 'rational permissibility' and that there is a sense in

³⁶ The equivalent part in the VP^u is 1^u(b).

³⁷ Chang, 'Parity, Internal Value, and Choice', p. 347.

which Jim may rationally choose either A or B at t_2 and there is a sense in which he may not.

Chang does not offer any good non-practical justification for the claim that Jim is rationally forbidden from choosing A at t_2 ; all she has said is that this allows Jim to avoid getting pumped. And yet her claim seems to *demand* non-practical support, just as rejecting parity demands non-practical support. We need a non-practical explanation of why it is that sometimes agents are permitted to choose either of two options which are on a par, and in some cases they are not. A justification of why it is that we are allowed to choose two options which are on a par would go something like this: 'it is rational to maximize value and since the options are on a par, neither option is better, so we maximize value whichever option we choose'. The problem is that we need to be given an explanation of why this rationale does not apply to the choice between A and B at t_2 . The only reason Chang gives is that this allows agents to avoid getting pumped. In spite of that, the difference seems to be ad hoc.³⁸ This completes my abductive argument. It might be true that there are good non-practical reasons to accept Chang's alteration to premise 1, but if there are, then these non-practical arguments would be doing the work, not the VP.

Chang's second claim is that there are different senses of rational permissibility. It is worth quoting Chang again:

If one chose B when offered a choice between A+ and B, one is thereby rationally prohibited from choosing A when offered a choice between B and A. This is true even though there is a sense in which because B and A are on a par, it is rationally permissible to choose either. This is the sense in which if one had not already chosen B over A+, it would have been rationally permissible to choose A over B. Sometimes, when items are on a par, it is both rationally permissible to choose either and also rationally impermissible to choose one of them. The air of paradox is dispelled once we see that the sense in which it may be rationally impermissible to choose one of two items on a par depends on understanding the rationality of choice against a background of other choices.³⁹

Here, Chang confuses the claim that there are different senses of permissibility with the claim that there are different conditions in which it is permissible to choose either option. Her point is not that there is 'a sense in which' Jim may permissibly choose A at t_2 . It is that

³⁸ The contrast with John Broome's defence of the normative importance of past choices is instructive. Broome defends that claim on the basis of persuasive non-practical argument and argues that a happy benefit of the claim is that it provides (admittedly extremely fragile) protection from the value pump. Broome argues that unrepudiated intentions place us under normative requirements, but not reasons, to carry out the means to the options chosen earlier in the choice series. See Broome, 'Are Intentions Reasons?'.

³⁹ Chang, 'Parity, Interval Value, and Choice', p. 347.

in a choice between B and A, Jim may permissibly choose A, had he not already chosen B earlier in the choice series.⁴⁰ Therefore, we may safely put Chang's claim to one side in discussions of the VP.

IX. CONCLUSION

The VP is impotent. First, in some circumstances, bad practical results obviously do not indict agents' rationality. So, the proponents of the VP must explain why it is that the bad practical outcomes matter in the VP, but not in these other cases. It is difficult to see what the argument could be, other than an appeal to non-practical arguments against premises 1 and 2. Second, careful consideration of possible revisions to theories of rational decision provides strong abductive support for the claim that VP is impotent. All possible revisions seem to be ad hoc. The best explanation of this is that the VP does not provide us with reasons. Indeed, it is accepted even by proponents of the VP, like Peterson and Chang, that some alterations to those premises are off the table for non-practical reasons: the practical consequences are irrelevant. What they fail to realize is that practical consequences are irrelevant to the assessment of all alterations to those premises.

This has a number of important implications. First, it undermines the main argument which has been offered for the axioms of expected value theory. Indeed, I have argued here that one of those axioms is false because options can be ordered negatively intransitively in terms of their subjective value. Second, the VP provides no reason to believe that options cannot be incomparable or on a par. Third, the VP provides no reason to believe that past choices have normative significance.

It is, of course, still of interest whether any resources of rationality can protect Jim from practical loss. Practical loss is bad news and if the series is iterated, poor old Jim could be left bereft of value. The point is that avoidance of loss in a value pump should be seen as a handy side-effect of an independently plausible theory of rationality, not as the determinant of the plausibility of that theory.⁴¹

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⁴⁰ This is different from Martin Peterson's critique of the argument. Peterson contends that Chang's conclusion follows from her premises, but that the conclusion ought to be rejected. Peterson, 'Parity, Clumpiness and Rational Choice', p. 512. I am saying that Chang's conclusion does not follow from her premises.

⁴¹ An earlier version of this article was presented to the Oxford Philosophy Department Ockham Society in 2013. I am thankful to all three people present for their helpful feedback. I am also thankful to Roger Crisp and Brian Hedden for helpful comments and suggestions. My biggest debt of gratitude is to the anonymous reviewer for *Utilitas* whose penetrating criticisms have made this article significantly better.