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VIII—Intrinsically Desiring the Vague

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If there are vague propositions, then the question arises whether it is rational to care intrinsically about the vague. This paper argues—*contra* Bacon (2018), the most comprehensive defence of vague proposition to date—that it is. Some things, such as pain, may be rational to care intrinsically about only if precise, but some things, such as truth, are rational to care intrinsically about even if vague.

I

The twin topics of this paper, propositional vagueness and rational intrinsic concern, are brought together in Bacon (2018), the most comprehensive defence of vague propositions to date. Bacon claims that p is vague if and only if it is not rational to care intrinsically about whether p. Propositional vagueness is the contradictory of propositional precision: p is vague if and only if p is not precise. So, according to Bacon, all three of the following hold:

(I.1) Some proposition is vague.
(I.2) If p is vague, then it is not rational to care intrinsically about whether p.[1]
(I.3) If p is precise, then it is rational to care intrinsically about whether p.[2]

A rationalist conception of propositional vagueness thus emerges. If all three hold, then vagueness is inconsequentiality: the distinction between what is and is not precise and the distinction between what

[1] My gloss of the principle Bacon (2018, p. 195) calls 'Indifference'.

[2] My gloss of the principle Bacon (2018, p. 243) calls 'Richness of Priors'. One could replace (I.3) with the following weakening: if p is precise, and each of p and $\neg p$ are consistent, then it is rational to care intrinsically whether p. But (I.3) is simpler, and allowing that it is rational to care intrinsically about whether p, even if p is inconsistent, will not affect the discussion.

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is and is not rational to care intrinsically about coincide, dividing propositions into the same non-empty classes.

This essay criticizes Bacon's rationalist conception of propositional vagueness. I am suspicious of (I.3). If it is not rational to care intrinsically about whether *p*, for some proposition *p*, then I suspect that it is not rational to care intrinsically about whether *q*, for some precise proposition *q*. But I focus my attention on *inconsequentialism*, the conjunction of (I.1) and (I.2), defending the following conditional thesis:

(I.4) If some proposition is vague, then for some vague proposition *p*, it is rational to care intrinsically about whether *p*.

Whether there are vague propositions is a matter of dispute. Orthodoxy says not. Some powerful arguments allege so, as we will see. But I will not take any definite stance. I am content to operate suppositionally, assuming that there are vague propositions and inquiring into what is and is not rational to care intrinsically about under that assumption.

II

The distinction between instrumental and intrinsic concern is familiar. Here are two quick illustrations:

> I get tested for cancer. I care about whether the test is positive, but I care only instrumentally. What I care intrinsically about is whether I have cancer.
>
> I am skydiving. I care about whether the parachute was packed by an expert, but I care only instrumentally. What I care intrinsically about is whether the parachute will function properly.

Instrumentality and intrinsicality apply in the first instance to desires, but the connection between desire and concern is tight. An agent cares about whether *p* if and only if either they desire that *p* or desire that $\neg p$, and concerns inherit instrumentality and intrinsicality from the associated desires. Instrumental desires beget instrumental concerns; intrinsic desires beget intrinsic concerns.[3]

Propositions are the contents of desire, not the objects. An agent desires that *p*, not *p*. But eliding that distinction sometimes eases the

[3] Some desires are both instrumental and intrinsic, as are some concerns.

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exposition. For example, eliding the content/object distinction I can state my thesis, (I.4), thus: if some proposition is vague, then some vague proposition is rational to intrinsically desire.

III

Bacon operates in a broadly Bayesian setting. He accepts classical logic and *bivalence*, the claim that every proposition is either true or false. He accepts a coarse-grained conception of propositions, accepting both of the following:

(III.1) Every proposition is a set of indices, and every set of indices is a proposition.[4]

(III.2) Every precise proposition is a set of precise indices, and every set of precise indices is a precise proposition.[5]

He assumes that the vague supervenes on the precise:

(III.3) Every proposition is necessarily equivalent to some precise proposition.

He also accepts probabilism. A *credence function* is a map from propositions to real numbers on the unit interval, and according to probabilism:

(III.4) Every rational credence function is a probability function.

These assumptions—the *Bayesian ground rules*, as I will call them—are not uncontroversial. But they are assumptions that I too will be making.

The Bayesian ground rules are meant to be accepted by both opponents and proponents of vague propositions. Opponents maintain that every proposition is precise: they think that every index is a precise index, that the finest partition of logical space is the partition into precise indices.[6,7] Proponents maintain that some propositions

[4] My gloss of the principle Bacon (2018, p. 32) calls 'Booleanism'.

[5] My gloss of the principle Bacon (2018, p. 35) calls 'Boolean Precision'.

[6] I ignore the distinction between an index and its singleton, thereby easing the exposition.

[7] On the familiar possible worlds approach, indices are identified with possible worlds. The possible worlds approach implies that every proposition is precise, given the Bayesian ground rules. If (III.3) holds, then a proposition is precise if no distinct proposition is necessarily equivalent to it. No two sets of possible worlds are necessarily equivalent. So if every proposition is a set of possible worlds, every proposition is precise; cf. Bacon (2018, p. 42).

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are not precise. They think that every precise index contains many indices.

IV

Every vague proposition is necessarily equivalent to some precise proposition. So why accept vague propositions? Bacon (2018, pp. 47–123) offers a battery of arguments. Let me here mention two.

The first goes by way of rational uncertainty.[8] Consider the following claim:

(IV.1) For some proposition p, some precise index y, and some rational credence function C, $0 < C(p \mid y) < 1$.

Given the Bayesian ground rules, (IV.1) implies vague propositions. If p is precise, y is a precise index, and C is a probabilistic credence function, then $C(p \mid y)$, if defined, equals either zero or one.[9]

The plausibility of (IV.1) is evinced by borderline cases. Let y be a precise index at which are Harry has exactly 30,000 hairs—here pretending, for the sake of illustration, that having a hair is precise. The first premiss of the argument is a claim about borderline cases:

(IV.2) Harry is borderline bald if y.

The second premiss connects borderline cases to rationality uncertainty:

(IV.3) If Harry is borderline bald if y, then it is rational to be uncertain whether Harry is bald conditional on y.

Every precise index necessitates every proposition that it is compossible with it, so y either necessitates that Harry is bald or necessitates that it is not the case that Harry is bald.[10] But it seems rational to be uncertain whether Harry is bald conditional on y, nevertheless. Rationality does not seem to require that we be certain about where the cut-off for baldness lies.

[8] This argument differs from, but is closely related to, the argument in Bacon (2018, pp. 69–95).

[9] If C is a probability function, and $C(y) > 0$, then $C(p \mid y)$ is defined and equals $C(p \wedge y)/C(y)$.

[10] Here I am assume that some proposition is the proposition that Harry is bald. That assumption could be denied.

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The third premiss connects rational uncertainty to middling credence:

(IV.4) If it is rational to be uncertain whether Harry is bald conditional on y, then for some proposition p and some rational credence function C, $0 < C(p \mid y) < 1$.

Propositions are the objects of uncertainty, so it is not clear how it could be rational to be uncertain whether Harry is bald conditional on y if no rational credence function gives middling credence to any proposition conditional on y.

These premisses are not indisputable; (IV.3) and (IV.4) merit further scrutiny. But all three enjoy considerable plausibility, and the three premisses together imply (IV.1).

The second argument goes by way of rational learning.[11] Think about a learning experience—a reliable informant telling you something, say. What you learn from the experience *inconclusively confirms* hypothesis h_1 relative to incompatible hypothesis h_2 just if what you learn confirms h_1 relative to h_2, but is consistent with both. More formally: what you learn inconclusively confirms h_1 relative to h_2 just if for some rational credence functions C_1 and C_2, it is rational to shift from C_1 to C_2 upon learning what you learn, $C_1(h_1)/C_1(h_2)$ and $C_2(h_1)/C_2(h_2)$ are defined and $C_1(h_1)/C_1(h_2) > C_2(h_1)/C_2(h_2)$. The first premiss of the argument says that one can learn something that inconclusively confirms one precise index relative to another. Illustrating the premiss with an example, let y_1 be a precise index throughout which Harry has exactly one hair, and let y_2 be a precise index throughout which Harry has exactly 30,000 hairs. The first premiss then can be stated as follows:

(IV.5) What you learn when a reliable informant tells you that Harry is bald inconclusively confirms y_1 relative to y_2.

Suppose that, before receiving the testimony, you rationally gave equal positive credence to y_1 and y_2. Then, according to (IV.5), it is rational, having received the testimony, to give unequal positive credence to y_1 and y_2, giving more credence to y_1 than to y_2.

The second premiss says what one learns when one learns something is a proposition. Adapted to the present example, it says:

[11] This argument parallels Bacon (2018, pp. 96–123).

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(IV.6) What you learn when a reliable informant tells you that Harry is bald is some proposition.

The third premiss says that no precise proposition inconclusively confirms one precise index relative to another. Adapted to the present example, it says:

(IV.7) No precise proposition inconclusively confirms y_1 relative to y_2.

According to a widely accepted view, the only rational response to learning is conditionalizing. Suppose that p is what you learn when a reliable informant tells you that Harry is bald. Then, according to this widely accepted view, it is rational to shift from C_1 to C_2 upon learning what you learn only if $C_2 = C_1(- \mid p)$. If p is precise, $C_2 = C_1(- \mid p)$ and $C_1(y_1)/C_1(y_2)$ and $C_2(y_1)/C_2(y_2)$ are defined, then $C_1(y_1)/C_1(y_2) = C_2(y_1)/C_2(y_2)$.[12] So if the only rational response to learning is conditionalizing, then (IV.7) holds.

Together, (IV.5), (IV.6) and (IV.7) imply vague propositions: they imply that what you learn when a reliable informant tells you that Harry is bald is a vague proposition. All three merit further scrutiny; the claims are not indisputable. But all three enjoy considerable plausibility.

These arguments underscore the strength of the case for vague propositions. They also provide a sense of the role that vague propositions play in rational psychology on the doxastic side of things. Vague propositions are—oversimplifying to get the gist across—things that are potentially epistemically distanced from the precise: propositions to which it is rational to give middling credence conditional on a precise index, and hence propositions that inconclusively confirm precise indices relative to one another.

That prompts a question: what role do vague propositions play in rational psychology on the bouletic side of things?

V

It is here that inconsequentialism is most distinctive. According to inconsequentialism, it is rational to care instrumentally about how things are vaguely, but it is not rational to care intrinsically.

[12] This assumes probabilism.

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Instrumental concerns have a distinctive pattern of abandonment. If I learn that I do (not) have cancer, then even if I remain rationally uncertain about whether my test is positive, I cease to care. If I learn that the parachute will (not) function properly, then even if I remain rationally uncertain about whether the parachute was packed by an expert, I cease to care. Continuing to care would not be just unusual—it would be irrational. Rationality requires that one abandon instrumental concerns given full information about how things are with respect to what one cares intrinsically about, and this provides an intuitive, semi-operational way of understanding inconsequentialism. According to inconsequentialism, it is rational to care about how things are vaguely—it is rational to care about whether the fossil found in the back yard is very old, for example—but it is not rational to care intrinsically. Rationality requires that one cease to care about how things are vaguely given full information about how things are precisely. Full information about how things are precisely—the truth of the precise index that holds—does not eliminate all rational uncertainty about how things are vaguely. If the fossil is borderline very old, then it is rational to continue to be uncertain whether the fossil is very old given full information about how things are precisely. But, according to inconsequentialism, it is not rational to continue to care.

Inconsequentialism is helpfully formulated using utility functions. A *utility function* is a map from indices to real numbers. Every rational utility function represents some rational pattern of intrinsic concern, and every rational pattern of intrinsic concern is represented by some rational utility function.[13] Propositions p and q are *co-precise* just if each is a non-empty subset of some precise index. Cast in terms of utility functions, the three Baconian theses mentioned at the outset, (1.1), (1.2) and (1.3), become, respectively:

(V.1) Some distinct indices are co-precise.
(V.2) A utility function is not rational if it maps some pair of co-precise indices to distinct values.
(V.3) A utility function is rational if it maps every pair of co-precise indices to the same value.

The Bayesian ground rules afford us a circular way of drawing the distinction between precise and vague propositions—a proposition

[13] The representation need not be unique in either direction.

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is precise if and only if it is a set of precise indices. But ideally we would break out of the circle, characterizing precise indices without appeal to vagueness or precision, and the theses above allow us to do so. If (V.2) and (V.3) hold, then precise indices are the strongest objects of rational intrinsic desire.[14] Suppose that we draw a distinction between indices just when some rational utility function maps them to distinct values. If (V.2) and (V.3) hold, then what we get at the end of our distinction drawing is the partition of logical space into precise indices.

I am suspicious of (V.3), no less so than of (I.3). If some utility function is not rational, then I suspect that some utility function that maps every pair of co-precise indices to the same value is not rational. But my primary target is inconsequentialism, and I will argue against inconsequentialism by arguing against one of its implications.

Inconsequentialism implies something striking about rational preference. If p and q are non-empty, and every rational utility function maps every index in $p \vee q$ to the same value, then it is not rational to prefer (that is, strictly prefer) p to q. Inconsequentialism thus implies:

(V.4) If p and q are co-precise, then it is not rational to prefer p to q.

I will argue that (V.4) fails if there are vague propositions. Before doing so, however, let me address a family of arguments against inconsequentialism that I find unconvincing.

VI

Inconsequentialism is ethically revisionary. It implies that almost everything alleged to be rational to care intrinsically about is not so. Consider some things that objective list theorists frequently include on their objective lists: the absence of pain, the presence of pleasure, the cultivation of love and friendship, the acquisition of knowledge, the creation and appreciation of beauty. All of these admit borderline cases—all of these are vague if there are vague propositions—so

[14] If (V.2) and (V.3) hold, then p is a precise index just if (a) it is rational to intrinsically desire that p, and (b) for any proposition q, if $p \wedge q$ is non-empty and distinct from p, then it is not rational to intrinsically desire that $p \wedge q$.

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none of these are rational to care intrinsically about if inconsequentialism holds.

A Moorean argument against inconsequentialism thus suggests itself. Adapted to the case of pain, the argument takes the following two claims as premisses:

(VI.1) It is rational to care intrinsically about whether there is pain.
(VI.2) Inconsequentialism implies that it is not rational to care intrinsically about whether there is pain.

The second premiss, (VI.2), is uncontroversial, and the first premiss, (VI.1), appears to be a Moorean fact.

But this Moorean argument is not convincing. The Moorean fact in the vicinity is not (VI.1), but rather:

(VI.3) If the proposition that there is pain is precise, then it is rational to care intrinsically about whether there is pain.

If pain is precise—if the proposition that there is pain is precise—then it is rational to care intrinsically about whether there is pain. But if pain is vague, then a strong case can be made that it is not rational to care intrinsically about whether there is pain.[15]

Consider a precise index *y* at which the most painful thing is a borderline pain. If there are vague propositions, then the indices in *y* disagree about whether there is pain. Degrees of painfulness are precise, I will assume: every index in *y* agrees about how painful each thing is.[16] I also will assume that pain supervenes on painfulness: that every index in *y* agrees that for some degree of painfulness *d*, there is pain just if the painfulness of something exceeds *d*.[17] The indices in *y* disagree about whether there is pain because they disagree about how painful something must be in order to be a pain.

If every proposition is precise, then every index agrees about which degree of painfulness the threshold for pain is. There is no difference between the proposition that there is pain and the proposition that the painfulness of something exceeds the threshold for pain, so if every index agrees that some particular degree of painfulness, d_i, say, is the threshold for pain, then the proposition that there is pain is the *de re* proposition that the painfulness of something

[15] If the proposition that something is *F* is precise/vague, then *F* is, itself, precise/vague.

[16] I also assume, for simplicity, that degrees of painfulness are linearly ordered.

[17] Some fiddly issues regarding open and closed intervals arise if degrees of painfulness are dense. But they are orthogonal to the main thrust, so I leave them ignored.

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exceeds d_i. It is rational to care intrinsically about how painful things are: for each degree of painfulness d, it is rational to care intrinsically about whether the painfulness of something exceeds d. So if every proposition is precise, then it is rational to care intrinsically about whether there is pain.

But if some propositions are vague, then indices disagree about which degree of painfulness the threshold for pain is. The proposition that there is pain is then the *de dicto* proposition that the painfulness of something exceeds the threshold for pain, whatever degree of painfulness the threshold for pain is. Caring intrinsically about whether there is pain is thus bizarre; for whether there is pain is then sensitive both to how painful things are and to which degree of painfulness the threshold for pain is.

Think about it in terms of preference. Suppose that the most painful thing at y is painful to degree d, and let o be the proposition that there is pain. If there are vague propositions, then there are two co-precise propositions, $y \wedge \neg o$ and $y \wedge o$. If it is rational to care intrinsically about whether there is pain, then it is rational to prefer $y \wedge \neg o$ to $y \wedge o$.

That it is bizarre to prefer $y \wedge \neg o$ to $y \wedge o$ may be immediately clear. If not, consider t^d, the proposition that the threshold for pain is less than or equal to d. Although o and t^d are distinct, $y \wedge o$ and $y \wedge t^d$ are identical: there is no difference between things being precisely thus and so and there being pain and things being precisely thus and so and the threshold for pain being less than or equal to d. To prefer $y \wedge \neg o$ to $y \wedge o$ is thus to prefer $y \wedge \neg t^d$ to $y \wedge t^d$. Unconditional preferences are equivalent to conditional preferences on the shared conjunct. To prefer $y \wedge \neg t^d$ to $y \wedge t^d$ is thus to prefer $\neg t^d$ to t^d, conditional on y. And that preference is, I trust, manifestly bizarre. It is bizarre to prefer the threshold for pain being greater than d to the threshold for pain being less than or equal to d conditional on y—it is bizarre to have any preference about where the threshold for pain lies.

Caring about pain is not bizarre, but caring about pain over and above degrees of painfulness is. It is bizarre to prefer a sensation that is painful to degree d and not a pain to a sensation that is painful to degree d and a pain. How painful things are is fully specified by how things are precisely. So while it is not bizarre to care about whether there is pain, it is bizarre to continue to care about whether there is pain given full information about how things are precisely—even if

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it is rational to continue to be uncertain about whether there is pain, just as one convinced of inconsequentialism would expect.

Of course, the relationship between the bizarre and the rational is contentious. There is a familiar view, often associated with Hume:

(VI.4) For every proposition *p*, it is rational to care intrinsically about whether *p*.[18]

It is bizarre to care intrinsically about whether there is pain if the proposition that there is pain is vague, but if (VI.4) holds, then it is rational to care intrinsically about whether there is pain, nevertheless.

Since (VI.4) implies (I.4), the thesis I seek to defend, rebutting (VI.4) is not my burden. It is inconsequentialists who must rebut (VI.4), and that might be none too easy. Inconsequentialists could embrace a restrictive conception of rational concern, a view that deems bizarre intrinsic concerns irrational. But Bacon himself does not. He accepts (I.3): he thinks that the precision of *p* implies that it is rational to care intrinsically about whether *p*. He thus defends a semi-permissive conception of rational concern, more restrictive than (VI.4), but permissive nevertheless: a view that deems many bizarre intrinsic concerns rational. It is bizarre to care intrinsically about whether a glass of water is at least 65.7% full. It is bizarre to care intrinsically about whether the glass of water is at least pretty full. According to Bacon, the former is rational, and the latter is not, even if it is a necessary truth that the glass of water is at least pretty full just if at least 65.7% full.

This alleged contrast is doubtful. It is hard to shake the suspicion that it is rational to care intrinsically about whether the glass of water is at least 65.7% full if and only if it is rational to care intrinsically about whether the glass of water is at least pretty full. As between (I.1), (I.2) and (I.3), the conjunction of vague propositions and the semi-permissive conception of rational concern defended by Bacon, and (I.1) and (VI.4), the conjunction of vague propositions and the familiar, fully permissive conception of rational concern, a strong case can be made for the latter.

But I am interested in whether my thesis can be defended without assuming a permissive conception of rational concern. The argument by way of (VI.1) and (VI.2) seems to fit the bill, since whether there is pain seems to be something that it is rational to care

[18] Cast in terms of utility functions (VI.4) is the view that every utility function is rational.

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intrinsically about even supposing a highly restrictive conception of rational concern. But if bizarre intrinsic concerns are not rational, then it is rational to care intrinsically about whether there is pain only if the proposition that there is pain is precise. On the assumption that there are vague propositions, (VI.1) fails.

And many things pattern as pain does. It is bizarre to care intrinsically about whether a relationship is a friendship if there are vague propositions. Preferring a relationship that is a friendship to a relationship that is not a friendship is not bizarre. But if a relationship being precisely thus and so settles which precise index holds, fully specifying how the relationship is intrinsically and extrinsically in precise respects, then preferring a relationship that is precisely thus and so and a friendship to a relationship that is precisely thus and so and not a friendship is bizarre.

It is bizarre to care intrinsically about whether a sunset is beautiful if there are vague propositions. Preferring a sunset that is beautiful to a sunset that is not beautiful is not bizarre, but preferring a sunset that is precisely thus and so and beautiful to a sunset that is precisely thus and so and not beautiful is bizarre.

Much of what is alleged to be rational to care intrinsically about is not so if there are vague propositions.

VII

One challenge to inconsequentialism stems from things that, although vague if there are vague propositions, purport to be preferentially decisive.

One example is tref.[19] Tref is vague if there are vague propositions, but tref does not pattern as pain does. It is not bizarre to prefer having ingested something that is precisely thus and so and kosher to having ingested something that is precisely thus and so and tref.

Another example is (moral) betterness. If some precise index is borderline better than another, then betterness is vague if there are vague propositions. And it seems that some precise index is borderline better than another. In fact, it seems that some pair of precise indices are each borderline better than the other.

Take the *trade-off series*: there is y, a precise index at which

[19] I owe this example to Andrew Huddleston.

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someone suffers a long and not intense pain, and $x_1, \ldots, x_{1{,}000{,}000}$, precise indices just like y except that they have a short pain instead of a long one. The pain in x_1 is short and not intense: x_1 is better than y. The pain in x_2 is short and slightly more intense: x_2 is better than y. The pain in $x_{1{,}000{,}000}$ is short and very intense: y is better than $x_{1{,}000{,}000}$. It seems that for some x, y is borderline better than x. In fact, it seems that for some x, y and x are each borderline better than the other.

Take the *population series*: there is y, a precise index at which there are 99 happy people, and precise indices, $x_1, \ldots, x_{1{,}000{,}000}$. Each x has 99 happy people, duplicates of the people at y, and one additional person. The additional person in x_1 is very happy: x_1 is better than y. The additional person in x_2 is slightly less happy: x_2 is better than y. The additional person in $x_{1{,}000{,}000}$ is miserable: y is better than $x_{1{,}000{,}000}$. It seems that for some x, y is borderline better than x. In fact, it seems that for some x, y and x are each borderline better than the other.[20]

Let $p > q$ be the proposition that (it being the case that) p is better than (it being the case that) q, and let x and y be precise indices. If each of x and y are borderline better than the other, then inconsequentialism implies:

(VII.1) Each of x and y are consistent with each of $x > y$ and $y > x$.

If each of x and y are consistent with each of $x > y$ and $y > x$, then it is rational to give positive credence to all four of the following conjunctions: $x \wedge x > y$; $y \wedge x > y$; $y \wedge y > x$; and $x \wedge y > x$. And if it is rational to give positive credence to all four of those conjunctions, then it seems rational both to prefer $x \wedge x > y$ to $y \wedge x > y$ and to prefer $y \wedge y > x$ to $x \wedge y > x$. Think of it in terms of conditional preference: if it is rational to give positive credence to all four conjunctions, then it seems rational both to prefer x to y, conditional on $x > y$, and to prefer y to x, conditional on $y > x$. Thus we have:

(VII.2) If each of x and y are consistent with each of $x > y$ and $y > x$, then it is rational both to prefer $x \wedge x > y$ to $y \wedge x > y$ and to prefer $y \wedge y > x$ to $x \wedge y > x$.

But if it is rational both to prefer a to b and to prefer c to d, then either it is rational to prefer a to d or it is rational to prefer c to b. So,

[20] For more on spectrum arguments in population ethics, see Temkin (2012).

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(VII.3) If it is rational both to prefer $x \wedge x > y$ to $y \wedge x > y$ and to prefer $y \wedge y > x$ to $x \wedge y > x$, then either it is rational to prefer $x \wedge x > y$ to $x \wedge y > x$ or it is rational to prefer $y \wedge y > x$ to $y \wedge x > y$.

The consequent of (VII.3) implies, contra inconsequentialism, that it is rational to prefer some proposition to some co-precise proposition, so we have an argument against inconsequentialism.

Rejecting (VII.3) would saddle inconsequentialism with a radical conception of utility and preference, so there are really just two options, denying (VII.1) or denying (VII.2).

Inconsequentialism implies (VII.1) if there is two-way borderline betterness among precise indices: if any pair of precise indices are each borderline better than the other. But one-way borderline betterness is enough to get the argument going. Let $p \leqslant q$ be the negation of $p > q$, and let x and y be precise indices. If any precise index is borderline better than another, then inconsequentialism implies:

(VII.4) Each of x and y are consistent with each of $x > y$ and $x \leqslant y$.

The following claim is, like (VII.2), very plausible:

(VII.5) If each of x and y are consistent with each of $x > y$ and $x \leqslant y$, then it is rational both to prefer $x \wedge x > y$ to $y \wedge x > y$ and to be indifferent between $x \wedge x \leqslant y$ and $y \wedge x \leqslant y$.

And, like (VII.3), the following claim should be uncontroversial:

(VII.6) If it is rational both to prefer $x \wedge x > y$ to $y \wedge x > y$ and to be indifferent between $x \wedge x \leqslant y$ and $y \wedge x \leqslant y$, then either it is rational to prefer $x \wedge x > y$ to $x \wedge x \leqslant y$ or it is rational to prefer $y \wedge x \leqslant y$ to $y \wedge x > y$.

Inconsequentialism is inconsistent with the conjunction of (VII.4), (VII.5) and (VII.6), so inconsequentialists cannot just deny that there is two-way borderline betterness among precise indices. If they want to accept (VII.2) and (VII.5), they must deny that any precise index is borderline better than any other.

Though consistent and bold, the claim that no precise index is borderline better than another is not credible. Borderline cases are not something we know not what. They have a distinctive epistemic signature, and that epistemic signature is seen when we compare the

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goodness of precise indices.[21] In the series above, some x is the worst x that is better than y. But which x is the worst x that is better than y is epistemically hidden, just as the greatest number of hairs that one can pluck from my head without making me bald is. Use the rational credence heuristic from above: take some rational credence function and conditionalize it on a precise index. Mightn't the result give, for some precise indices x and y, positive credence both to $x > y$ and $x \leqslant y$? It seems clear that it might.

And if there is one-way borderline betterness among precise indices, then there is also two-way borderline betterness. Use the rational credence heuristic again: take some rational credence function and conditionalize it on a precise index. Mightn't the result give, for some precise indices x and y, positive credence to both $x > y$ and $y > x$? It seems clear that it might. The case for (VII.1) is strong.

But if inconsequentialists accept (VII.1), they must deny (VII.2), and denying (VII.2) is costly. Think about an example: I, one of the happy 99, must decide whether to create an additional someone. I am certain that precise index x will hold if I create the additional someone; I am certain that precise index y will hold if I do not create the additional someone; and I give positive credence to all four conjunctions, $x \wedge x > y$, $y \wedge x > y$, $y \wedge y > x$ and $x \wedge y > x$. It seems rational to defer to betterness—it seems rational both to prefer creating to not creating, conditional on creating being better than not creating, and prefer not creating to creating, conditional on not creating being better than creating.[22] But deferring to betterness is not rational if (VII.2) fails. An agent *weakly prefers* p to q just if the agent either is indifferent between p and q or prefers p to q, and if (VII.2) fails, then rationality requires that I either weakly prefer not creating to creating, conditional on creating being better than not creating, or weakly prefer creating to not creating, conditional on not creating being better than creating. And that generalizes: if (VII.2) fails, then rationality requires that one either weakly prefer x

[21] Someone who tied borderline cases to language use might claim that something admits borderline cases only if it is semantically plastic, that is, could easily have been used similarly and expressed something else. It is not clear that 'better' is semantically plastic, so such views might deny that there are borderline cases of betterness. But the conception of borderline cases being mooted here is not tied to language use. Semantic plasticity is therefore beside the point. If vagueness is propositional, the connection borderline cases and their epistemic signature is tight.

[22] Some radical forms of normative externalism, such as the ones defended by Harman (2015) and Weatherson (2014), look unfavourably upon deferring to betterness. It would be interesting if inconsequentialists had to accept some such view.

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$\wedge\ y > x$ to $y \wedge y > x$ or weakly prefer $y \wedge x > y$ to $x \wedge x > y$, whenever precise indices x and y are each borderline better than the other and one gives positive credence to all four conjunctions.

The vague supervenes on the precise, so some precise relation, $\succ$, is necessarily equivalent to betterness. Although inconsequentialists who deny (VII.2) must deny that it is rational to prefer $p \wedge p > q$ to $q \wedge p > q$ whenever both are non-empty, they can accept that it is rational to prefer $p \wedge p \succ q$ to $q \wedge p \succ q$ whenever both are non-empty. But that does little to salve the hurt. For the agent is rationally uncertain about how x and y stand vis-à-vis betterness, if (VII.2) fails, and it is betterness itself that purports to be preferentially decisive.

VIII

The problem persists when we change the basis. Consider (moral) permissibility, the dual of (moral) obligation. Permissibility appears to admit borderline cases:

> *Darryl's Diversion*. Darryl is watching his two-year-old daughter play in the city park. It is permissible to divert his attention for one second. It is not permissible to divert his attention for five minutes. Is it permissible to divert his attention for 30 seconds? 31? 32? Plausibly, we can create a Sorites series, admitting of borderline cases of permissibility, out of a series of diversions whose lengths differ only by a second. (Schoenfield 2016, p. 262)[23]

Let d be the claim that Darryl diverts his attention for, say, 31 seconds. Suppose that d is true throughout precise index y,[24] and let $P(d)$ be the claim that d is permissible. The following two claims together imply the falsity of inconsequentialism:

(VIII.1) Each of $y \wedge P(d)$ and $y \wedge \neg P(d)$ are non-empty.
(VIII.2) If each of $y \wedge P(d)$ and $y \wedge \neg P(d)$ are non-empty, then it is rational to prefer to $y \wedge P(d)$ to $y \wedge \neg P(d)$.

Darryl's Diversion is not special; apparent borderline cases of permissibility abound. The limit of one's personal space admits

[23] Schoenfield credits this example to Ian Proops. Similar cases are discussed in Constantinescu (2014) and Dougherty (2014).

[24] We could relax this assumptions and focus on $y \wedge d \wedge P(d)$ and $y \wedge d \wedge \neg P(d)$, instead of $y \wedge P(d)$ and $y \wedge \neg P(d)$.

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borderline cases if anything does, and if someone has not given me permission to be in their personal space, then the limit of their personal space may make the difference between it being permissible and it being impermissible for me to stand where I am standing. Some possible abortions appear borderline permissible. Some possible secret-keepings appear borderline permissible. The many trade-offs life throws at us—intensity versus duration of pain, security versus liberty, flourishing versus equality—all seem to supply borderline cases of permissibility. And it appears that we can create borderline cases of permissibility by exercising our moral powers: if Harry is borderline bald, and I consent to being touched only by those who are bald, then Harry touching me appears to be borderline permissible. I focus on Darryl's Diversion, but other examples pose the same structural threat. To resist the first premiss of the argument inconsequentialists must deny that permissibility is vague if there are vague propositions: they must deny that for any precise index y and proposition p, $y \wedge p \wedge P(p)$ and $y \wedge p \wedge \neg P(p)$ are each non-empty. And that claim, though consistent and bold, is not credible. Permissibility is vague if there are vague propositions.

But inconsequentialists who accept (VIII.1) must deny (VIII.2), and denying (VIII.2) is costly. The contrast between pain and permissibility is stark.

Consider someone with the bizarre preference mentioned above, someone who prefers a sensation that is painful to degree d and not a pain to a sensation that is painful to degree d and a pain. Such a someone, upon learning or supposing that there is a sensation that is painful to degree d, will have bizarre worries and hopes. They will worry that the sensation is a pain, and hope that it is not.

If Darryl prefers $y \wedge P(d)$ to $y \wedge \neg P(d)$, then that will affect his psychology in parallel ways. Upon learning or supposing that y, he will worry that he diverted his attention impermissibly, and hope that he did not. But those worries and hopes are not bizarre. Those are worries and hopes that we expect decent people to have. Darryl is, after all, upon learning or supposing that y, rationally uncertain whether he acted impermissibly. If he does not hope that he acted permissibly, if whether he acted permissibly is nothing to him, then we worry about him and his decency.

The truth of y settles much about Darryl's diversion. If degrees of negligence are precise, then y specifies the degree to which the diversion is negligent. If degrees of self-indulgence are precise, then y

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specifies the degree to which the diversion is self-indulgent. But Darryl is, upon learning or supposing that y, rationally uncertain whether the diversion is permissible—he is rationally uncertain whether he acted as he ought not to have. If he is not worried that he acted as he ought not to have, if whether he acted as he ought not to have is nothing to him, then we worry about him and his decency.

When cases pattern as pain does, there is an effective bit of rhetorical therapy: who cares if the sensation is a pain if it is precisely thus and so? Who cares if the relationship is a friendship if it is precisely thus and so? But the rhetorical therapy applied to this case—who cares if Darryl ought not to have diverted his attention as he did if he diverted his attention precisely thus and so?—does not hit home.

Every preference among co-precise propositions is a conditional preference about where a vague threshold lies. Say that the threshold for permissible diversions is *long* just if any diversion not longer than d in circumstances like Darryl's is permissible. If Darryl prefers $y \wedge P(d)$ to $y \wedge \neg P(d)$, then he prefers the threshold for permissible diversions being long to the threshold for permissible diversions being not long conditional on y. Where the threshold for permissible diversions lies is not nothing to him.

But as strange as it might seem from a purely formal point of view, that is an altogether ordinary preference to have. Parents often worry that they have diverted their attention for impermissibly long, and their worry is not entirely owed to uncertainty about the length or circumstance of the diversion. Conditional on the diversion being precisely thus and so, they hope that they have diverted their attention permissibly, and worry that they have not.

An exhausted parent who loves their child might want to divert their attention for as long as they permissibly can. Where the threshold for permissible diversions lies is not nothing to them, and that does not seem to render them less than fully rational.

The conception of rationality embraced by inconsequentialists who deny (VIII.2) is radically unlike the one embraced by so-called motivational internalists. Motivational internalists claim that rationality forbids amoralism: that one cannot be fully rational if one is sometimes or always indifferent to whether something is permissible.[25] Inconsequentialists who deny (VIII.2) claim that rationality requires amoralism: that one cannot be fully rational unless one is

[25] For discussion and examples, see Rosati (2016) and citations therein.

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sometimes or always indifferent to whether something is permissible. They think that rationality requires that each of us be indifferent between Darryl permissibly diverting his attention precisely thus and so and impermissibly diverting his attention precisely thus and so, for example.

And even someone disinclined by motivational internalism should find rationally required amoralism disturbing, as we can see by substituting tref for impermissibility. Motivational internalism is not true of tref. A fully rational agent can be sometimes or always indifferent to tref. But a fully rational agent can be sometimes or always indifferent to tref only by being at least to some degree a non-participant, a *kashrut* outsider. Inconsequentialism thus has the disturbing consequence that a fully rational agent cannot be a full *kashrut* participant. Tref is vague if there are vague propositions, so inconsequentialism implies that one cannot be fully rational unless one is sometimes or always indifferent to tref.

And if (VIII.1) holds—if permissibility is vague if there are vague propositions—then inconsequentialism implies something similar about morality. Perhaps, *pace* motivational internalism, a fully rational agent can be sometimes or always indifferent to permissibility. But a fully rational agent can be sometimes or always indifferent to permissibility only by being at least to some degree a non-participant, a moral outsider. So if (VIII.1) holds—if permissibility is vague if there are vague propositions—then inconsequentialism has the disturbing consequence that a fully rational agent cannot be a full moral participant.[26]

IX

Another challenge to inconsequentialism stems from things that, although vague if there are vague propositions, serve as success conditions.

One example is walking some distance faster than ever before. Someone engaged in race walking for its own sake might care

[26] Things are more disturbing if some theses associated with motivational internalism hold. For example, if one cannot have the concept of permissibility and be sometimes or always indifferent to permissibility, then (VIII.1) and inconsequentialism together imply that it is not rational to have the concept of permissibility. (Thanks to Kieran Setiya for this point.) But the consequence that rationality requires that one not be a full moral participant is plenty disturbing in its own right.

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intrinsically about whether they set a personal best, walking some distance faster than ever before. Doing so does not seem irrational. But walking some distance faster than ever before is vague if there are vague propositions. Flying—having both feet off of the ground—admits borderline cases, and one does not walk a distance if one flies while travelling it. Inconsequentialism thus implies that it is not rational to care intrinsically about whether one has walked some distance faster than ever before; and if race walking for its own sake is rational only if it is rational to care intrinsically about walking some distance faster than ever before, then inconsequentialism implies that race walking for its own sake is not rational.

Something similar applies to inquiry, understood as the pursuit of truth. Someone engaged in inquiry for its own sake might care intrinsically about whether their beliefs are true. Doing so does not seem irrational. But truth is vague if there are vague propositions. If p is a vague proposition, then how things are precisely may not settle whether my belief that p is true. Inconsequentialism thus implies that it is not rational to care intrinsically about whether one's beliefs are true; and if inquiring for its own sake is rational only if it is rational to care intrinsically about whether one's beliefs are true, then inconsequentialism implies that inquiring for its own sake is not rational.

Truth does not pattern as pain does. It is not bizarre to prefer a belief that is precisely thus and so and true to a belief that is precisely thus and so and false. But inconsequentialism treats pain and truth alike. If inconsequentialism holds, then it is not rational to prefer a belief that is precisely thus and so and true to a belief that is precisely thus and so and false.

The same, of course, goes for other epistemic attitudes. Let $0.6(p)$ be the proposition that one's credence in p equals 0.6. It seems rational to care intrinsically about whether one's 0.6 credence is closer to truth or falsehood. It seems rational to prefer $y \wedge 0.6(p) \wedge p$ to $y \wedge 0.6(p) \wedge \neg p$, if both are non-empty. But, according to inconsequentialism, rationality requires that one be indifferent between $y \wedge 0.6(p) \wedge p$ and $y \wedge 0.6(p) \wedge \neg p$.

Epistemic attitudes admit borderline cases, and thus pose their own threat to inconsequentialism, distinct from the threat posed by truth. If there are vague propositions, then indices in some precise index y agree that p is the content of some propositional attitude of mine, and agree that p is true, but disagree about whether I believe that p. It is rational to prefer the epistemically better to the

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epistemically worse, all else being equal, and believing truly is epistemically better than not believing truly. So, letting $B(p)$ be the proposition that I believe that p, we can argue against inconsequentialism by appeal to the following two claims:

(IX.1) Each of $y \wedge B(p) \wedge p$ and $y \wedge \neg B(p) \wedge p$ are non-empty.[27]
(IX.2) If each of $y \wedge B(p) \wedge p$ and $y \wedge \neg B(p) \wedge p$ are non-empty, then it is rational to prefer $y \wedge B(p) \wedge p$ to $y \wedge \neg B(p) \wedge p$.

Inconsequentialism implies (IX.1), so inconsequentialism fails if (IX.2) holds.

It is not obvious that (IX.2) holds, however. If the indices in y disagree about whether I believe that p, then my relation to p is intimate and belief-like. Perhaps I affirm it under some guises and deny it under others. Perhaps I take it for granted in reasoning, but disavow it. Perhaps my attitude is on the border between believing and imagining. Being related to a true proposition in the precise way that I am related to p is epistemically good, in much the way that believing a true proposition is, irrespective of whether the precise relation constitutes belief. The evaluation of (IX.2) is thus subtle. Is believing that p epistemically better than not believing that p, conditional on being related to p precisely thus and so? Do precise relations to propositions screen off the relevance of belief, as degrees of painfulness screen off the relevance of pain? I am not sure. Different cases move me differently. If my attitude toward p is a borderline case of belief because my credence in p is borderline high enough, then I am somewhat inclined to think that believing that p is not epistemically better than not believing that p, conditional on being related to p precisely thus and so. By contrast, if my attitude toward p is a borderline case of belief because my attitude is on the border between believing and imagining, then I am somewhat inclined to think that believing that p is epistemically better than not believing that p, conditional on being related to p precisely thus and so. Believing aims at truth in a way that imagining does not, so I am somewhat inclined to think that believing truly is an epistemic success in a way that imagining truly is not. But I am not sure about (IX.2). The argument against inconsequentialism by way of (IX.1) and (IX.2) is, to my mind, inconclusive.

[27] Since $y = y \wedge p$, $y \wedge B(p) = y \wedge B(p) \wedge p$ and $y \wedge \neg B(p) = y \wedge \neg B(p) \wedge p$. I write it redundantly to make the contrast between (IX.2) and (IX.4) clearer.

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The threat that truth poses is less uncertain. If there are vague propositions, then the indices in some precise index y agree that I believe that p, but disagree about whether p is true, and thus disagree about whether I truly believe that p. Truly believing that p is epistemically better than falsely believing that p, so we can argue against inconsequentialism by appeal to the following two claims:

(IX.3) Each of $y \wedge B(p) \wedge p$ and $y \wedge B(p) \wedge \neg p$ are non-empty.[28]
(IX.4) If each of $y \wedge B(p) \wedge p$ and $y \wedge B(p) \wedge \neg p$ are non-empty, then it is rational to prefer $y \wedge B(p) \wedge p$ to $y \wedge B(p) \wedge \neg p$.

Or focusing on credence instead of belief, we can argue against inconsequentialism by appeal to the following two claims:

(IX.5) Each of $y \wedge 0.6(p) \wedge p$ and $y \wedge 0.6(p) \wedge \neg p$ are non-empty.
(IX.6) If each of $y \wedge 0.6(p) \wedge p$ and $y \wedge 0.6(p) \wedge \neg p$ are non-empty, then it is rational to prefer $y \wedge 0.6(p) \wedge p$ to $y \wedge 0.6(p) \wedge \neg p$.

Inconsequentialism implies (IX.3) and (IX.5), so inconsequentialists must deny (IX.4) and (IX.6). But unlike (IX.2), (IX.4) and (IX.6) are, I think, obvious. It is not obvious that it is rational to care intrinsically about believing if believing is vague. But it is, I think, obvious that it is rational to care intrinsically about truth if truth is vague.

To deny (IX.4) and (IX.6), inconsequentialists must find something that screens off the relevance of truth as degrees of painfulness screen off the relevance of pain. What might do the screening off? I can think of two proposals.

The first is evidential support. Suppose that evidence is precise:[29] that the degree to which an agent's evidence supports a proposition is equal at every co-precise index.[30] If evidence also screens off the relevance of truth—if preferring a belief that is evidentially supported to degree x and true to a belief that is evidentially supported to degree x and false is on all fours with preferring a sensation that is painful to degree d and not a pain to a sensation that is painful to degree d and a pain—then (IX.4) fails. It is then not rational to prefer a belief that is precisely thus and so and true to a belief that is precisely thus and so

[28] Since $y = y \wedge B(p)$, $y \wedge p = y \wedge B(p) \wedge p$ and $y \wedge \neg p = y \wedge B(p) \wedge \neg p$.

[29] Consider a precise index at which I attend to two distant lights, one almost clearly brighter than the other. If there are vague propositions, then it seems that the indices in the precise index might disagree about whether my evidence includes the proposition that the one is brighter than the other.

[30] Bacon (2018, p. 99) comes close to claiming that evidence is precise.

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and false. And (IX.6) fails, similarly. If evidence is precise, and evidence screens off the relevance of truth, then it is not rational to prefer $y \wedge 0.6(p) \wedge p$ to $y \wedge 0.6(p) \wedge \neg p$.

It is doubtful that evidence is precise. But that aside, the claim that evidence screens off the relevance of truth—the claim that a rational agent cares intrinsically about evidential support and only instrumentally about truth—is not plausible. Let x be the claim that my evidence supports p to degree x. The following claims, which inconsequentialists must deny, are no less obvious than are (IX.4) and (IX.6):

(IX.7) If each of $y \wedge B(p) \wedge p \wedge x$ and $y \wedge B(p) \wedge \neg p \wedge x$ are non-empty, then it is rational to prefer $y \wedge B(p) \wedge p \wedge x$ to $y \wedge B(p) \wedge \neg p \wedge x$.

(IX.8) If each of $y \wedge 0.6(p) \wedge p \wedge x$ and $y \wedge 0.6(p) \wedge \neg p \wedge x$ are non-empty, then it is rational to prefer $y \wedge 0.6(p) \wedge p \wedge x$ to $y \wedge 0.6(p) \wedge \neg p \wedge x$.[31]

Rational concern for evidence depends on rational concern for truth, and dependent concerns do not screen off the relevance of the concerns on which they depend.

The second proposal is precise truth. Proposition p is *precisely true* at index z just if p is true at every index co-precise with z. Proposition p is *precisely unsettled* at index z just if neither p nor $\neg p$ is precisely true at z. If the indices in y disagree about whether p, then my belief that p, although true at some indices in y, is not precisely true at any index in y. So if precise truth screens off the relevance of truth—if rationality requires that one cease to care about what is true given full information about what is precisely true—then (IX.4) fails. And (IX.6) fails, similarly. If precise truth screens off the relevance of truth, then it is not rational to prefer $y \wedge 0.6(p) \wedge p$ to $y \wedge 0.6(p) \wedge \neg p$.

Precise truth is not truth. If bivalence holds, then precise truth is a strengthening of truth, much as necessary truth is. To be precisely true is—to close enough approximation for our purposes—to be true and not epistemically distanced from the precise.

Precise truth may be an epistemic good: precisely true beliefs may be epistemically better than true beliefs that are not precisely true. But the claim that precise truth screens off the relevance of truth is not just

[31] (IX.7) and (IX.8) are equivalent to (IX.4) and (IX.6) if evidence is precise, but true, I think, even if evidence is not precise.

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the claim that precise truth is an epistemic good. It is the much more radical claim that truth in the absence of precise truth is not.

There are ways to argue that precise truth does not screen off the relevance of truth. Let '∇' symbolize precise unsettledness. If precise truth screened off the relevance of truth, then one would expect the following principle to hold:

(IX.9) For any rational credence function C and any propositions p and q, $C(p| \nabla p \wedge \nabla q) = C(q| \nabla p \wedge \nabla q)$, if both are defined.

And (IX.9) fails. If an agent is rationally certain that Harry has fewer hairs than Harrier does, then it is rational for them to give non-zero credence to Harrier being bald, and more credence to Harry being bald than to Harrier being bald, even if they are rationally certain both that it is precisely unsettled whether Harry is bald and that it is precisely unsettled whether Harrier is bald.

But there is also an argument that the Bayesian ground rules imply that is rational to care intrinsically about truth even if truth is vague.

X

The arguments immediately above are immanent, in the sense of being concerned with the truth or nearness to the truth of epistemic attitudes had. A closely related argument is transcendental, in the sense of being concerned with the truth or nearness to the truth of epistemic attitudes had or not. The transcendental argument alleges that inconsequentialism is inconsistent with the Bayesian ground rules.

Transcendental arguments of this sort are most familiar in epistemic utility theory.[32] An *epistemic utility function* is a map from credence function–index pairs to real numbers. Each epistemic utility function induces a notion of ideality: credence function C_1 is *ideal* at index z, relative to epistemic utility function e, just if for every credence function C_2, $e(C_1, z) \geqslant e(C_2, z)$. The credence functions that are *rationally ideal* at z are the credence functions that are ideal at z, relative to some rational epistemic utility function, and the credence

[32] See Pettigrew (2019) and citations therein.

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functions that are *somewhere rationally ideal* are the credence functions that are rationally ideal at some index.

There is a natural mathematical connection between rational credence functions and somewhere rationally ideal credence functions:

(X.1) A credence function is rational only if it is a convex combination of somewhere rationally ideal credence functions.

A credence function *indicates* index z just if it maps every proposition true at z to one and every proposition false at z to zero, and a credence function is an *indicator function* just if it indicates some index. The only credence function at zero distance from the truth at index z is the credence function that indicates z, so the following claim has much appeal:

(X.2) Relative to every rational epistemic utility function, credence function C is ideal at index z if and only if C indicates z.

Together, (X.1) and (X.2) imply probabilism. Every convex combination of indicator functions is a probability function.

The crux of the argument against inconsequentialism is a principle that forges a connection between rational utility functions and rational epistemic utility functions. Utility function u is *insensitive to vagueness* just if, for any pair of co-precise indices z_1 and z_2, $u(z_1) = u(z_2)$. Epistemic utility function e is *insensitive to vagueness* just if, for any credence function C and any pair of co-precise indices z_1 and z_2, $e(C, z_1) = e(C, z_2)$. The principle that forges the connection is the following:

(X.3) If every rational utility function is insensitive to vagueness, then every rational epistemic utility function is insensitive to vagueness.

Inconsequentialism implies that every rational utility function is insensitive to vagueness, and if (X.3) holds, inconsequentialism also implies that every rational epistemic utility function is insensitive to vagueness.

It is hard to see how (X.3) could fail. Co-precise indices sometimes agree about which credence function an agent has. If some rational epistemic utility function e is sensitive to vagueness, then for some co-precise indices z_1 and z_2 and some credence function C, z_1 and z_2 agree that some agent has C, and $e(C, z_1)$ exceeds $e(C, z_2)$. If z_1 and

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z_2 agree that some agent has C, and $e(C, z_1)$ exceeds $e(C, z_2)$, then all else being equal, it is rational to prefer z_1 to z_2. Else is not always equal: z_1 could be morally worse than z_2, for example. But if some rational epistemic utility function e is sensitive to vagueness, then for some co-precise indices z_1 and z_2 and some credence function C, z_1 and z_2 agree that someone has C, $e(C, z_1)$ exceeds $e(C, z_2)$, and it is rational to prefer z_1 to z_2. So, if every rational utility function is insensitive to vagueness, then every rational epistemic utility function is insensitive to vagueness.

The consequence of (X.3) that is most important for our purposes is the following:

> (X.4) If z_1 and z_2 are co-precise indices, then credence function C is rationally ideal at z_1 if and only if C is rationally ideal at z_2.

Inconsequentialists should accept (X.4), I think.

Probabilists, however, should not. Let $C(- \mid p)$ be the conditional distribution of C on p, the credence C gives to each proposition conditional on p,[33] and say that z is *rationally defined* just if $C(- \mid z)$ is defined, for some rational credence function C. Everyone should accept:

> (X.5) For some pair of co-precise indices z_1 and z_2, both z_1 and z_2 are rationally defined.

Everyone also should accept:

> (X.6) If index z is rationally defined, then credence function C_1 is rationally ideal at index z just if $C_1 = C_2(- \mid z)$, for some rational credence function C_2.

Indices are the strongest non-empty propositions, so if z is rationally defined, then there should be no difference between being rationally ideal at z and being identical to some rational credence function conditional on z.

But probabilism is inconsistent with the conjunction of (X.4), (X.5) and (X.6). Let z_1 and z_2 be a pair of rationally defined co-precise indices, and suppose that for some rational credence function C_1, $C_1(- \mid z_1)$ is defined. By (X.6), $C_1(- \mid z_1)$ is rationally ideal at z_1. So, by (X.4), $C_1(- \mid z_1)$ is rationally ideal at z_2. So, by (X.6), for some

[33] For a discussion of conditional credence in non-classical and non-probabilistic settings, see Williams (2016, §6).

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rational credence function C_2, $C_2(- \mid z_2) = C_1(- \mid z_1)$. But that contradicts probabilism. The credence function that indicates z_1 is distinct from the credence function that indicates z_2, and probabilism implies that $C_1(- \mid z_1)$ and $C_2(- \mid z_2)$ indicate z_1 and z_2, respectively, if C_1 and C_2 are rational credence functions and $C_1(- \mid z_1)$ and $C_2(- \mid z_2)$ are defined.

The Bayesian ground rules imply probabilism, so the Bayesian ground rules are inconsistent with inconsequentialism if inconsequentualism implies (X.4), and (X.5) and (X.6) hold. This is the transcendental argument that inconsequentialism conflicts with the Bayesian ground rules.

Someone inclined by inconsequentialism could reject probabilism, of course. There are well-behaved views that verify (X.4). A credence function *precisely indicates* index z just if it maps every proposition precisely true at z to one and every proposition not precisely true at z to zero, and a credence function is a *precise indicator function* just if it precisely indicates some index. The role that indicator functions play for probabilists is played by precise indicator functions on what we might call the *Fieldian view*:[34]

(X.7) Relative to every rational epistemic utility function, credence function C is ideal at index z just if C precisely indicates z.

Every pair of co-precise indices is precisely indicated by the same credence function, so (X.7) implies (X.4).

The convex combinations of precise indicator functions are *Fieldian functions*—Dempster-Shafer functions that satisfy the probability axioms with respect to the algebra of precise propositions. No Fieldian function is a probability function, so (X.1) and (X.7) together imply that no probability function is a rational credence function. But the Fieldian view is mathematically well-behaved and consonant with inconsequentialism—it is one natural way of fleshing out the idea that precise truth screens off the relevance of truth.

The Fieldian view is hard to reconcile with the arguments for vague propositions above. It falsifies (IV.1), for example.[35] It predicts that for every rational credence function C and every

[34] So named because it is inspired by Field (2000). Bacon (2018, pp. 124–9) argues against the Fieldian view at length.

[35] The view is also hard to square with (IV.5).

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proposition p, $C(p \wedge \nabla p)$ equals zero, thus predicting that it is not rational to give middling credence to Harry being bald conditional on a precise index throughout which he has 30,000 hairs. It also verifies (IX.9), predicting that $C(p \wedge \nabla p \wedge \nabla q) = C(q \wedge \nabla p \wedge \nabla q) = 0$, for any rational credence function C and any propositions p and q.[36]

But if inconsequentialism implies (X.4), and (X.5) and (X.6) hold, then the Bayesian ground rules are inconsistent with inconsequentialism.

XI

Bacon does not offer any master argument for (I.2), the claim that it is not rational to care intrinsically about whether p if p is vague.[37] He takes it as a postulate, content to let it inherit support from the theory in which it plays a role. But something about the postulate resounds. For many of us there is a deeply felt sense that it does not matter where in the borderline region the division between cases and non-cases lies, and if there are vague propositions, then (I.2) is a natural regimentation of that deeply felt sense.

Many cases pattern as (I.2) predicts. It is bizarre to care intrinsically about how much pain there is if pain is vague. It is bizarre to care intrinsically about how much friendship there is if friendship is vague. It is not bizarre to care about how things are vaguely. The proposition that the fossil is very old is vague if there are vague propositions, and it is not bizarre to care about whether the fossil is very old. But it is bizarre to care intrinsically. It is bizarre to continue to care about whether the fossil is very old upon learning the precise age of the fossil, even if the precise age of the fossil leaves you rationally uncertain about whether the fossil is very old.

That said, (I.2) is false if there are vague propositions. It might be thoroughly false. Every vague proposition is a counterexample

[36] The Fieldian view also may violate identity, the claim that for any rational credence function C and proposition p, $C(p \mid p)$, if defined, equals one. Every precise indicator function gives credence zero to every index, so if any index is rationally defined, then for every rational credence function C, $C(z \mid z)$, if defined, equals zero.

[37] Although see Bacon (2018, pp. 195–201).

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if the permissive view associated with Hume, (VI.4), holds. But even if (I.2) is not thoroughly false, it is selectively false. It is rational to care intrinsically about tref, even if tref is vague. It is rational to care intrinsically about truth, even if truth is vague. If there are vague propositions, then caring intrinsically about how things are vaguely is at least sometimes rational.

Naturally one seeks a theory, an account of when something vague is rational to care intrinsically about. I do not have one to offer; I doubt there is one to be had. No account is to be had of when something improbable is rational to care intrinsically about. If only some things are rational to care intrinsically about, then the only account of when something improbable is rational to care intrinsically about is the application, to improbable propositions, of the full theory of when something is rational to care intrinsically about, and I suspect that the same goes for vague propositions, if there are such things.

But the foregoing discussion makes vague propositions more doubtful. One weighty argument against vague propositions is methodological. It says that we should oppose vague propositions until we have a clear conception of what it is for a proposition to be vague. Bacon's rationalist conception of propositional vagueness stays this methodological argument, allowing propositional vagueness to be understood in terms of rational intrinsic desire. But Bacon's rationalist conception of propositional vagueness must be rejected if we reject inconsequentialism, the conjunction of (I.1) and (I.2). The foregoing discussion thus allows the methodological argument to rear again.

If there are vague propositions, then there are interesting questions to ask about propositional vagueness and rational intrinsic concern. But it will be hard to engage profitably with those questions until we have what we currently lack: a clear conception of what it is for a proposition to be vague.[38,39]

[38] Of course, one possibility is that propositional vagueness must be taken as primitive, as it is in Barnett (2009).

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