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A Defense of Principled Positivism

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Constitutional theory has taken a "positive turn" in recent years, as theorists have begun to realize the need for a constitutive theory of law, that is, a theory identifying the factors that determine the contents of law and explaining how they do so.[1] One champion of this trend is Mitchell Berman, who defends a general jurisprudential theory he calls "principled positivism" (or "organic pluralism" when applied to American constitutional law).[2] Principled positivism holds that legally significant social facts ground legal principles and legal principles (together with certain other facts) ground legal rules. Berman advocates for principled positivism because it avoids two major flaws with the dominant Hartian positivist theory. Whereas orthodox Hartian positivism can't account for the operation of principles in the law and forces us to conclude that there is far less law than we tend to think, principled positivism tells a coherent story about the role of principles in our law and yields determinate legal answers about as often as we would pre-theoretically expect to find them.

Despite its promise, Berman's principled positivism faces a serious challenge: the combinability problem. In brief, the problem is that there doesn't appear to be any non-arbitrary function that takes as input the various competing grounds of law pluralism posits and spits out a determinate answer. The problem is not new – Larry Alexander and Ken Kress have long argued that the problem is endemic to pluralist theories – but recently Will Baude and Steve Sachs turned their fire on Berman's theory in particular. Applied to principled positivism, the problem is that there appears to be no non-arbitrary way to move from a set of principles that pull in various directions

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[1] Mitchell Berman, *Our Principled Constitution*, 166 U. PA. L. REV. 1325, 1329 (2018); see also Charles Barzun, *The Positive U-Turn*, 69 STANFORD L. REV. 1323 (2017) (describing the positive turn as manifest in the work of Will Baude and Stephen Sachs and arguing that its prospects are dim).

[2] Berman develops this view in *Our Principled Constitution* and *How Practices Make Principles* (July 20, 2022) (unpublished manuscript). See *How Practices Make Principles* at 3 for the distinction between principled positivism and organic pluralism (note this is not made in Berman's earlier work).

with varied forces to a determinate legal answer. Baude and Sachs argue that doing so would require an assignment of weights to the principles and there is no reasonable way to extract such an assignment from the social facts that Berman thinks ground legal principles.

In this paper, I draw on Bayesian epistemology and decision theory to argue that this objection is misguided: we do not need numerically precise weights and we can reasonably assign rough weights to principles based on the social facts that ground the law. I proceed as follows. In § 1, I give a brief précis of principled positivism. I then turn in § 2 to an explication of the objections from Alexander, Kress, Baude, and Sachs. In § 3, I explain the basics of Bayesian epistemology, a simple version of decision theory, and how Bayesians have responded to similar challenges. I then draw on the Bayesian response in § 4 to marshal a defense of principled positivism in two stages. Stage one argues that the success of Bayesian epistemology in responding to similar objections itself blunts the challenge to principled positivism. Stage two begins the project of developing analogous responses within constitutional theory that could defeat, rather than merely blunt, the challenge. Finally, in § 5, I conclude by taking stock of the progress made and giving some thoughts on work that remains to be done.

1. **Précis of Principled Positivism**

In a nutshell, principled positivism maintains that law is a complex artificial normative system in which social facts ground principles, and principles, together with certain facts they make relevant, ground rules. Let's unpack that nutshell piece by piece.

Artificial normative systems are something like collections of norms that depend for their existence on human activity, serve to guide behavior in some recognizable domain, and are only thinly normative.[3] For example, the norms governing professional table tennis include the rules promulgated

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[3] Berman, *Our Principled Constitution*, 1360-68.

by the World Table Tennis Federation (e.g., players must toss the ball at least six inches into the air on their serve) and unwritten norms (e.g., one should raise a hand in apology if one scores by a lucky bounce off the net or the edge of the table). These norms clearly form a collection that guides professional players and officials, allowing them to coordinate their behavior into a stable, enjoyable, and fair game rather than devolving into Calvinball.[4] The artificiality of these norms is apparent as they did not exist prior to the promulgation of the rules and the hand-raise apology becoming a common response to lucky points. The lack of force these norms have for casual players in basements across the world, where serving out of the hand is routinely permissible and lucky shots are celebrated, illustrates both their artificiality (where the relevant humans do not consult and apply the rules or share same the conception of sportsmanship as the professionals, the norms do not exist) and their "thin" normativity (they only have force for professionals or those who agree to play by professional rules and so are contingently binding).

In simple artificial normative systems (and standalone social norms), the norms are directly grounded in the social facts.[5] In complex normative systems, some norms of the system do not exist directly because of the underlying social facts. Instead, they are the product of some other features of the system that are themselves grounded in the social facts. Thus, some norms in a complex system can exist even if the participants in the system would be surprised to discover their existence.[6] For law to be a complex artificial normative system thus means that law must contain two kinds of norms: fundamental norms and derivative norms.

The social facts ("taking up" behaviors) that make a principle a norm of a legal system are "legally significant speech act[s] that purport[] to invoke and rely upon such principle, by a legal agent

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[4] See *Calvinball*, THE CALVIN AND HOBBES WIKI (accessed Dec. 29, 2022), https://calvinandhobbes.fandom.com/wiki/Calvinball.

[5] Berman, *How Practices Make Principles*, at 7.

[6] *Id.*

or institution" and "acceptance, as legally correct, of decisions or rulings that [the principle] is understood to explain."[7] Whose behaviors count and to what degree is itself a matter of the attitudes and behaviors of members of the legal community: "Those persons who play privileged roles in the determination of the fundamental legal norms are those whom other participants in the practice recognize as having privileged law-determination roles."[8] Thus, the set of social facts that ground a principle P in a political community like ours includes judges issuing decisions that invoke P or rely on a decision that invoked P,[9] "other legal (and popular) elites" championing P,[10] legislatures enacting authoritative texts asserting P,[11] and even the statements and views of generic members of the legal community, at least indirectly.[12] But the basic idea is that when enough relevant people in the legal community treat P as a principle of law, then P *is* a principle of law. That basic idea is enough for our purposes.

The fundamental norms for the principled positivist are principles and the derivative norms are rules.[13] Rules are decisive norms: when they apply, they yield a determinate answer to the question at hand. Principles are weighted and contributory: they influence or exert force on the answer to a question without necessarily deciding it.[14] Put another way, with rules the relevant question is "which rule applies?" but with principles, the relevant question is "which principles bear on this, how much, and what is their net effect?"

Principles ground rules by interacting with each other and with facts that they make relevant to determine the legal status of token acts that constitute a type. The facts they make relevant are the

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[7] *How Practices Make Principles*, at 23, 25.

[8] *Id.* at 23.

[9] *Id.* at 25.

[10] *Id.*

[11] *Id.* at 24.

[12] *See* Berman, *Our Principled Constitution*, at 1380-1381.

[13] *Id.* at 21-22. It might be more accurate to say that rules are derivative norms and at least some principles are fundamental norms. Nothing Berman says either embraces or forecloses the possibility of derivative principles, as far as I can see.

[14] See Berman, *Our Principled Constitution*, at 1330-31; *How Practices Make Principles*, at 10.

least controversial piece of the picture. If it's a principle that the original meaning of authoritative texts matters, then facts about what contemporaneous dictionaries said and how other contemporaneous texts used various words and elements of syntax are relevant. The relevant facts are those needed to understand which status the principle favors and how much. The relevance of these facts falls out of the content of the principle in an obvious and uncontroversial way, so we can leave off discussing them further here.

The more interesting part of the story about how principles yield legal judgments and ground rules is how the principles interact with each other to determine judgments and how the underlying social facts influence this interaction. Recall that principles are norms that exert force toward one legal conclusion or another. For principles to yield a legal conclusion, there must be something that determines how much force each exerts and some way of aggregating these forces, some function that specifies their net effect. As Berman sees it, the same social facts about legal practices in the community that ground the existence of principles determine their weight:

> The weights of principles, like their contents or contours, are brought about by members of the legal community taking them up and deploying them in legal reasoning and decisionmaking. Weights are relative to one another, and are given by what members of the legal community say about them and how they use them. They are also conferred, as it were, by battle – by the rules that are adjudged victorious, and thus made so, when principles press in opposing directions.[15]

The aggregation function is also determined in part by these same social facts, which can ground meta-principles that shape the interaction of first-order principles or the emergence of new principles in much the same way as they ground first-order principles and their weights.[16] The aggregation function is also shaped by the rational relation doctrine: "the content of the law is in principle accessible to a rational creature who is aware of the relevant law practices."[17] This puts pressure on the system to

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[15] *Id.* at 1368.

[16] *See* Berman, *How Practices Make Principles*, at 34-36.

[17] *Id.* at 33, quoting Mark Greenberg, *How Facts Make Law*, 10 LEGAL THEORY 157 (2004), *reprinted and revised as* SCOTT HERSHOVITZ Ed., EXPLORING LAW'S EMPIRE 225, 237 (2006).

choose relatively simple aggregation principles. Berman gives reasons to think the aggregation function

will vary across legal systems and is non-committal about the particular function that exists in any

particular legal system but does seem to favor something close to simple additive weighting (SAW),

which is at the least useful for exposition.

SAW is easy to understand. For two choices *A* and *B* being evaluated according to three criteria

x, *y*, *z*, both choices are given a score on each criterion. The score on each criterion is multiplied by

some number between 0 and 1 representing the relative importance of the criteria and the weighted

scores are summed. The option with the highest total wins.

	x	*y*	*z*	Total
A	10	20	12	$10(0.5) + 20(0.25) + 12(0.25) = 13$
B	8	12	16	$8(0.5) + 12(0.25) + 16(0.25) = 11$
Weight	0.5	0.25	0.25	

Applied to Berman's principled positivism, the weight of principles builds in their relative importance

(a principle with greater weight is thereby more important than those with less weight), so we wouldn't

assign a score and then discount based on relative importance. However, we would need to account

for the second dimension of force that principles have on Berman's account, which he calls

"activation." Activation is the degree to which a given principle bears on the legal question at hand (a

level of force that varies with contexts, unlike the principle's weight).[18] To illustrate, Berman asks us

to assume a principle favoring continuity with historical practice. That principle will be more activated

– and thus have more force – the longer and more broadly the practice in question was followed.[19]

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[18] Berman, *Our Principled Constitution*, 1373; *How Practices Make Principles*, 22. Note that Berman appears to think of this not as an epistemic matter – how confident we are that the principle applies – but rather an ontological or metaphysical matter – the degree to which the principle *really* applies. He does not comment on the effect uncertainty should have. That is, whether the force exerted by, say, the principle that the original meaning of the text matters should be less if our confidence in our interpretation is 0.75 rather than 0.95.

[19] Berman, *How Practices Make Principles*, at 30-31.

To build activation and weight into a SAW model, it would be natural (though not required) to think of activation as how much of a principle's inherent force is brought to bear in the situation. We could aggregate principles by assigning a score for activation between 0 and 1, multiplying each principle by its activation score, and then summing the principles on each side in the same manner as above. Returning to the example of continuity with historical practice, the full weight of the principle would be its force when the relevant practice was followed always and everywhere in the legal community to date. The degree of activation would be determined by something like the proportion of times and places across the community's history at which the practice was followed.

One final piece of principled positivism remains to be explicated before we can consider objections to the view: how principles determine rules. Principles ground a rule by determining the legal status of a set of token acts such that (1) each token has the same status (e.g., permissible/impermissible) and (2) the tokens together form a type.[20] For example, if federal courts decide that enjoining State court proceedings in criminal case C_1 would violate principles of equity, comity, and federalism because enjoining the State proceedings would undermine the State's ability to effectively pursue its policies in an area of traditional state concern and decides the same in all other criminal cases $C_2, C_3, \ldots C_n$, then we can say it's a rule that federal courts should not enjoin State courts in criminal proceedings. In each case, the injunction is forbidden (same status) and the case is criminal (same type).[21] Such summary rules are thus a shorthand description of the result determined by principles across a range of cases, rather than themselves norms doing real work.

Yet it sure looks like sometimes rules are explanatorily primary. If the legislature in Pennsylvania passes a law stating that residents must pay 0.5% higher income tax next year, then it is

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[20] *Id.* at 27-32.

[21] Of course, that the rule is "no injunctions halting State court proceedings in *criminal* cases" also depends on the permissibility of such injunctions in at least some civil cases, else we would not have reason to identify criminal cases as the relevant type. For simplicity, I consider how to identify the relevant type that the tokens fall under. This may be a complex task in some instances but does not create any special difficulty for Berman's theory.

a legal rule that Pennsylvanians must pay the higher tax and the rule doesn't look like it emerges from the interaction of principles across a range of cases.   Berman's principled positivism allows for such "promulgated rules" insofar as the legal system includes principles giving weight to the pronouncements of certain legal institutions. When a legislature enacts a statute, the legislature attempts to create a rule by adding to the set of social facts that determine the principles of the legal system and their application. On Berman's view, if the principle(s) giving effect to the meaning and/or the legal intentions of the statute have sufficient weight, the legislature will succeed – the text will shift the balance of principles and thus create the intended rule. But importantly (and in contrast to textualist theories), this is a contingent fact. Other principles in the system might give enough weight to other things such that the resulting rule does not mirror the meaning or legal intentions of the statutory text.[22] Thus, promulgated rules too arise out of the interaction of principles, even when the resulting rule mirrors the meaning or intention behind an authoritative pronouncement.

Berman recommends principled positivism for its ability to remedy two deficiencies in orthodox Hartian positivism. First, Hartian positivism can't account for the operation of legal principles because derivative legal norms are derived by validation, which is a kind of lexical determination and thus cannot incorporate the inherently contributory and non-decisive force of principles.[23] Second, on Hartian theory, fundamental legal norms require near universal consensus. But there is rarely such consensus in our legal system. So, if Hartian theory is true, there's very little law in our system. But intuitively, we don't have so little law.[24] Principled positivism avoids these problems by (1) positing that derivative norms are grounded in non-lexical aggregation of the

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[22] *Id.* at 37-38.
[23] *Id.* at 2-3, 10-15.
[24] *Id.* at 19-20.

fundamental norms and (2) requiring much less than near universal consensus, even permitting a minority of legal actors to ground fundamental norms of a legal system.[25]

With this sketch of Berman's principled positivism on the table, we are ready to consider the principal objections to the view.

2. The Assault on Principled Positivism

Pluralist views have long struggled with the combinability problem – the problem of how conflicting considerations in different modalities come together to determine a univocal legal outcome.[26] Philip Bobbitt did not even try to solve the problem, arguing that the lack of determinacy was somehow a virtue of his theory because it preserved a role for the conscience of judges.[27] Richard Fallon, to his credit, attempted a solution and one that avoided the patent absurdity of Bobbitt's embrace of indeterminacy.[28] But Fallon's response was to sort of squint at the modalities and readjust them (apparently based on no objective criteria) to achieve alignment on one outcome if possible, and if not, to decide based on a hierarchy for which Fallon gave little justification. This too is an unsatisfying response.

Two versions of the combinability problem have been raised against pluralist theories. First, Larry Alexander objects that the kind of combination required by a pluralist theory is incoherent:

> No one – not even lawyers – can meaningfully "combine" fact and value, or facts of different types, except lexically in the manner I described above. Any non-lexical "combining" of text and intentions, text and justice, and so forth is just incoherent, like combining pi, green, and the Civil War. There is no process of reasoning that can derive meaning from such combinations.[29]

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[25] *Id.* at 20-22

[26] Mitchell N. Berman and Kevin Toh, *Pluralistic Nonoriginalism and the Combinability Problem*, 91 TEX. L. REV. 1739, 1762-64 (2013).

[27] PHILIP BOBBITT, CONSTITUTIONAL INTERPRETATION 164-169 (1991).

[28] Richard Fallon, *A Constructivist Coherence Theory of Constitutional Interpretation*, 100 HARVARD L. REV. 1189, 1237–1268 (1987).

[29] Lawrence Alexander, *The Banality of Legal Reasoning,* 73 NOTRE DAME L. REV. 517, 521 (1998) (footnotes omitted); *see also Practical Reason and Statutory Interpretation*, 12 LAW & PHIL. 319 (1993) (arguing that normative and factual

Berman and co-author Kevin Toh have compellingly answered this objection at length.[30] And we can see from the précis above that if we can derive principles' weights and activation values from the relevant social facts, then we can coherently combine them to arrive at a decision (via something like SAW). There is no combination of facts and values occurring because it is *the principles* that do the work (not the facts they make relevant).[31] Moreover, there is a well-developed literature on multi-factor decisionmaking and real agents make decisions based on multiple factors of different kinds routinely, e.g., architects and engineers consider materials cost, aesthetics, usability, and environmental harms when designing and building structures, so there must be *some way* to combine those factors.

Perhaps what's really driving Alexander's opposition is the second objection, viz., that there is no reasonable way to assign weights and activation values to principles from the relevant social facts – problem that does not arise for determining from those facts which conditions trigger the application of which rules via lexical determination.[32] After all, to get from a statement of principles to some function that aggregates and compares the principles, we need to assign weights to the considerations in play, but to get from a statement of principles to the statement of propositional logic used in lexical determination, we only need to plug in sentences articulating the considerations.

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elements can't be blended). Lexical determination is determination according to strict logical rules, for example "If the original meaning of the text supports one answer, go with that. If the original meaning does not support one answer, then if historical practice supports an answer, go with that one. If historical practice does not support an answer, then if fairness supports an answer, go with that one." Non-lexical determination is determination by combining contributions of various factors at once to yield an answer.

[30] See Berman and Toh, *Pluralistic Nonoriginalism and the Combinability Problem*, at 1746-1777.

[31] Berman, *Our Principled Constitution*, at 1377 n.166 ("I have not squarely explained how this pluralist constitutivism meets Alexander's non-combinability objection. . . . A short answer is that legal principles *alone* determine legal rules, and that facts determine the relative extent to which each principle is *activated*.").

[32] Elsewhere Alexander's critique seems to focus on the "unstructured" nature of the blending proposed by particular pluralist theories, objecting that they are "not mechanical," "have no pre-established formula for combining factors," and have "no hierarchy of considerations." *Practical Reason*, at 326-27, n.14. But if weights can be assigned to principles, simple weighted aggregation seems to be a structured/mechanical/formulaic/hierarchical way to blend principles.

Alexander also raises this second objection, with co-author Kenneth Kress: "[W]e cannot establish legal principles by agreement because we cannot establish their weights by agreement."[33] Baude and Sachs join the chorus here as well, putting Berman's principled positivism directly in the crosshairs of the objection: "We are not convinced that our legal practitioners engage in a process that looks like weighing, and even if they do, we are not convinced that any particular assignment of weights can be derived from our practice."[34] Unfortunately, none of these critics develop the objection in greater detail. But the basic idea is intuitive enough. In some domains, it's not hard to see how things could be assigned numerical values – we have scales to measure physical weight, chronometers to measure speed, altimeters to measure height, and so forth. But we don't have a legal machine that takes in principles (or the social facts that ground them) and spits out a number. Nor do we have anything that looks like it could yield numerical values for principles. So how do principles get the weights they need to aggregate and yield a verdict? And how can legal actors discern what those weights are?

As noted above, Berman argues that the weight of principles is grounded in the same social facts as the principles themselves:

The weights of principles, like their contents or contours, are brought about by members of the legal community taking them up and deploying them in legal reasoning and decisionmaking. Weights are relative to one another, and are given by what members of the legal community say about them and how they use them. They are also conferred, as it were, by battle – by the rules that are adjudged victorious, and thus

made so, when principles press in opposing directions.[35]

Berman acknowledges that this process can give us only rough weights, not numerically precise ones ("think: slight, moderate, weighty, very weighty, or nearly conclusive").[36] But, he claims, these rough weights still yield determinate answers in enough cases to blunt the too-little-law objection. First, he notes that in many cases we may confidently reach a verdict based on the sheer number of principles that favor one side over the other.[37] Unless some of the much smaller number of principles on the one side are very weighty and many of the principles on the other side are of little weight, the side with the much greater number will win. And there's no reason to think principles are so often in near equipoise that legal actors can't discern the correct verdict.

Second, Berman notes that in addition to the rough weights, principles can be more or less activated.[38] Yet, it's unclear how this helps. Presumably, degrees of activation are also rough. If the concern is that rough weights are not determinate enough to allow us to see which verdict should win, how could adding another force with rough values help? For that matter, how could adding a force with precise values help? Charitably read, Berman's point seems to be this: rough weights get us to an answer in some cases, viz., when the principles stack up on one side, and for those cases in which we aren't confident in an answer from the rough weights alone, activation can get us to an answer in some cases because the activation values may significantly magnify the force of the principles on one side or diminish those on the other, pushing us out of equipoise. Thus, we end up with confident verdicts in more cases overall.

But one might wonder why considering activation will not just as often muddy the waters in cases that otherwise would be clear by boosting the side with fewer principles or weakening the side

[35] Berman, *Our Principled Constitution*, at 1368.
[36] Berman, *How Practices Make Principles*, at 26.
[37] *Id.* at 30.
[38] *Id.* at 30-31.

with more. Assuming that *a priori* the probability that any given principle is more or less activated is roughly equal, shouldn't we expect that adding activation into the mix to have a net neutral effect? There are three possible outcomes considering weight alone: (1) cases of total equipoise, (2) cases in which the principles' weight favors one legal status over the other but not strongly enough for a confident verdict, and (3) cases in which the principles' weight favors one legal status over the other strongly enough for a confident verdict. If considering activation is to help with the too-little-law objection, Berman must give us some reason to think that considering activation will push more cases at least from (1) to (2) or (3) and preferably from (1) and (2) to (3).

In personal correspondence, Berman explained that activation and weight together yield more determinate answers than weight alone because the extent of variation in activation will greatly exceed the extent of variation in weight, such that in some cases, activation will do nearly all the work in determining the verdict. Even with this further explanation, it is not clear to me on first blush why adding activation helps. How does the activation shifts more cases from (1) to (2) and (3) (at a minimum)? As best I can tell, Berman's point is this: adding activation to the mix expands the possible values for the force each principle contributes (expanding the possible values from the principle's full weight to any value from its full weight down to a small proportion of its weight) and activation's high degree of variation ensures that the contributory force of principles will occupy a wide range of those possible values, thus decreasing the odds that the forces arrayed on each side end up too close together for a confident verdict.

In case that's not clear, let me attempt to illustrate the point. Consider the two board-game spinners pictured below:[39]

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[39] I recognize the illustration is not great. I struggled to find one that would be simple enough to make the point intuitive, while also capturing the context invariance of weights, the indeterminacy of weights, the expansion of the possible force values, and the increased variation across possible results all at once. For some aspects, coin flips or dice rolls work better, but the resulting value is determinate. For indeterminacy, the spinner works pretty well, but it doesn't represent the way activation determines the proportion of the weight that applies and makes it harder to
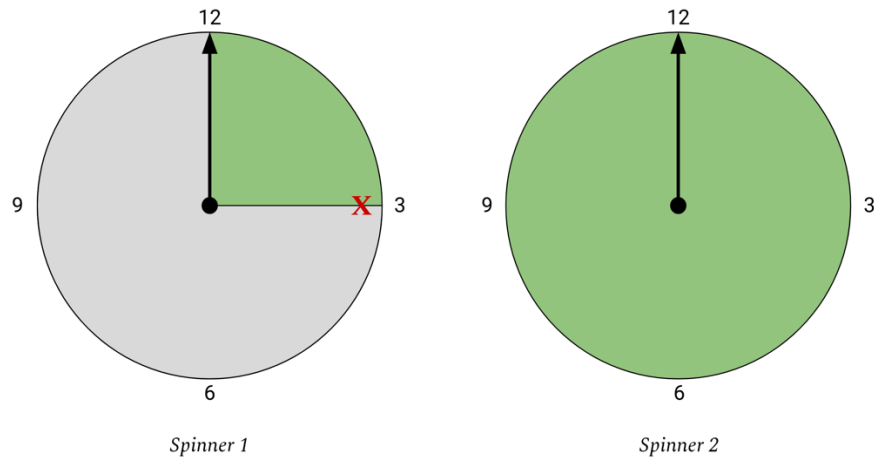
Spinner 1   Spinner 2

Spinner 1 only yields values 0-3 because there is a peg at the red X that blocks the arrow from going further. Moreover (let us suppose), because most people spin it with enough force to get at least halfway to 3 but not enough to bounce all the way back below the midway point, spins tend to clump up between 1.5 and 3. Spinner 2 yields values between 0 and 12 and (let us suppose) all values in the range are equiprobable on most spins.

Now, suppose we use Spinner 1 to decide whether some act A is permissible or impermissible. We spin it once, estimate the value (we don't have a protractor and there are no markers between zero and three), and assign that to "permissible." Then we spin it again, estimate the value, and assign that to "impermissible." Whichever status ends up with the greater value is the status we apply to A. There will be a fair number of cases in which are uncertain about which spin yielded the greater value because

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explain how activation expands the range of possible values. The next best alternative would be to replace Spinner 1 with a coin flip to determine which legal status the principle's weight supports and Spinner 2 with a coin flip followed by a spin resulting in values from 0 to 1 that determines the activation level. But then the indeterminacy of the weights drops out. The ideal would be to create a toy model with a few principles assigned rough weights and actually calculate the *a priori* odds of close cases based on the range of those weights and the possible combinations of principles on each side, then compare that to a calculation of the same principles and weights if adjusted for activation (essentially expanding the possible range of values from 0 or near 0 to the maximum of the rough-weight range). I'm sure there's a way to do that math and demonstrate that adding activation increases the odds of determinate outcomes. And I'm sure there's a way to calculate it based on different assumptions about the degree of variance in activation too (i.e., whether all activation levels are equiprobable or whether the more extreme levels are more or less probable than the central activation levels). I made a couple of attempts to work up such a model and do the calculations, but I just don't have the math background or time to work it out given that we are working with continuous ranges of values, so I could not brute force it by walking through each possibility (as they are technically infinite).

(i) the values are imprecise estimates, (ii) the range of possible values is small, and (iii) values tend to

clump between 1.5 and 3 instead of varying uniformly across the range. But if we use Spinner 2, the

greater range of possible values and the more uniform distribution of results across that range means

there will be more cases with determinate answers because there will be more cases in which the two

spins are far enough apart that the imprecise values we assign them don't overlap.

Considering weight alone is analogous to using Spinner 1: there are fewer possible values and

values tend to clump in a small range (less variance). Adding activation is analogous to using Spinner

2: the range of possible values increases (because the total force on either side is no longer limited to

the possible combination of sums of the principles' context-invariant weights but can be any

proportion of those sums) and the results are more broadly distributed across that range (because

activation varies widely across contexts).[40] Thus, the resulting values on each side are less likely to be

close together meaning we get determinate answers in more cases than when considering weight alone.

QED.[41]

If this is Berman's point, I think he is correct that the highly variable character of principles'

activation does significantly increase the proportion of cases in which principled positivism can yield

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[40] Of course, there may be multiple principles on either side in a legal dispute, so the analogy here is a bit loose. Hopefully it's clear that the features noted here based on one spin per side would hold if we used multiple spins to assign forces to multiple principles on each side.

[41] As pointed out in the summary of Berman's view above, it is natural conceptualize weight as the maximum force a principle could bring to bear (something like its intrinsic relative importance vis-á-vis the other principles) and activation as determining how much of that force is brought to bear in the given case.[41] If that's our model, then activation might seem to decrease the possible values, lowering the total force from the maximum weight of the principles arrayed on each side down to some proportion of that weight. But this is a misconception – it's not about total value possible but about the number of possible values. Considering weight alone, a principle can only contribute one value (or range of values): its maximum. But considering highly variable activation, the principle may contribute many different values from its maximum down to a small proportion of its maximum. By thus increasing the range of possible values and ensuring a fairly wide distribution of outcomes across those values, activation decreases the odds that the principles on each side sum to similar values and so increases the probability of any given case having a determinate, knowable answer.

Given this conception of the relationship between weight and activation, it might be better to illustrate considering weight alone as a coin flip (the principle's pre-assigned max force applies or it doesn't) and considering both weight and activation as a coin flip followed by a spin with possible values from 0-1 that would determine what proportion of the principle's force gets applied. But then the indeterminacy of the weight would drop out. Though I suppose that could be added into the initial assignment of weight to the principle.

determinate answers, though how much depends on the actual degree of variance. That is an empirical question to be answered by identifying principles and tracking their estimated activation value across real cases, which time and space do now allow me to consider here. I assume here that the degree of activation is quite high. I thus take Berman's point to be significant progress in responding to the second version of the combinability problem. Still, it would be nice if we could say more and beef up the response. In the rest of the paper, I will attempt to do so by drawing on work in Bayesian epistemology (and some associated decision theory) that responds to similar objections. In the next section, I begin this project by giving a high-level explanation of Bayesian epistemology (and associated versions of decision theory) and the similar challenges it faces.

3. A Foray into Bayesian Epistemology

a. Bayesian Basic Training

Traditionally, epistemologists studied "all out" concepts such as belief and knowledge. But over the past few decades, a new branch of epistemology, Bayesian epistemology, emerged that focuses on a different concept: credence. A credence is an agent's confidence in the truth of a proposition.[42] Bayesian epistemologists model credences as numerical values between zero and one (inclusive) and argue that a rational agent's credences will conform to some set of mathematically definable constraints on the structure of an agent's set of credences and on changes to the agent's credence in light of new evidence (often, according to Bayes's Theorem,[43] hence the name). Typically,

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[42] The nature of credences is itself controversial but my sense is there is a fairly strong consensus that credences are confidence attitudes toward propositions not, for example, beliefs about the probability of a proposition or partial beliefs (whatever that would be).

[43] Bayes's Theorem says that the probability of a hypothesis H conditional on some evidence E is equal to the product of the prior probability of E given H and the prior probability of H, divided by the prior probability of E. Formally: $\Pr(H|E) = (\Pr(E|H) * \Pr(H)) / \Pr(E)$. That is, the probability of a hypothesis on some piece of evidence is greater to the extent the hypothesis leads us to expect that evidence (E given H), to the extent H was already highly probable (prior probability of H), and to the extent E is surprising on other hypotheses (prior probability of E).

Bayesians hold that any rational set of credences must satisfy the axioms of probability theory and various norms derivable from these simple axioms.

Some notation and terminology will be helpful before moving on. I will follow standard notation in representing an agent's credence in P of degree x as $\text{cr}(P) = x$. Bayesians generally argue that an agent's credences should be a probability function, that is, a function from propositions to real numbers that respects the axioms of probability theory. A function respects the axioms of probability theory if and only if it yields no real number lower than 0 (Non-Negativity) or higher than 1 (Normality) and the probability of the disjunction of any two mutually exclusive propositions is equal to the sum of their individual probabilities (Finite Additivity). Credences play an important role in decision theory, a discipline that studies general rational norms on the preferences of agents.[44] The orthodox view is that rational agents maximize expected utility and that the expected utility of an act A equals the sum of the value to the agent of each possible outcome of the act O times the agent's subjective probability (which I will understand as the agent's credence) that the outcome will result if she performs A. That is, $\text{EU}_A = \sum V(O_i) * \text{cr}(O_i|A) + \ldots + V(O_n) * \text{cr}(O_n|A)$.

Bayesian epistemologists motivate the move to consider fine-grained levels of confidence by noting features of our epistemic life that can't be analyzed well in terms of all-out belief. First, our behavior suggests we have different degrees of confidence in different propositions we believe. For example, when I woke up this morning, I believed that my brakes were in good working order and that the Eagles will win the NFC championship. I bet my life on the former when driving to the coffee shop today, but I wouldn't bet $100 on the latter. Intuitively, what explains this difference is my

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[44] Katie Steele and H. Orri Stefansson, *Decision Theory*, STANFORD ENCYCLOPEDIA OF PHILOSOPHY (Edward N. Zalta, ed. Oct. 9, 2020), https://plato.stanford.edu/entries/decision-theory/.

different degrees of confidence in the two propositions, a difference not representable in terms of all-out beliefs, which do not come in degrees.[45]

Second, suppose someone has one ticket in a fair lottery of a million tickets. It's a fair lottery, so the agent ought to believe that some ticket will win. But the agent ought to believe his ticket will lose – the probability that it will is 0.999999 after all.[46] And by the same reasoning, the agent ought to believe of each other ticket that it will lose. Since one ought to believe the logical entailments of one's beliefs, the agent ought to believe that no ticket will win. But then the agent ought to believe a contradiction and that can't be.

If we analyze the case in terms of credences, however, there's no problem. Each ticket has a one-in-a-million chance of winning, so for each, the agent's credence that it will win should be 0.000001. An uncontroversial norm on credences states that one's credence in a proposition and its negation should sum to 1. So, for each ticket, the agent's credence that it will lose should be 0.999999. By another uncontroversial norm, one's credences in a disjunction of mutually exclusive probabilities should be the sum of the individual probabilities of the disjuncts. So, the agent should have a credence of 1 that some ticket will win (the sum of 1,000,000 tickets with probability of 0.000001 each).[47] No contradiction arises between the attitude the agent should have to each ticket's winning and the attitude the agent should have to some ticket winning. Given that the appeal to credences here allows us to explain the proper epistemic response of a rational agent in such situations that we can't give in terms of all-out belief, we are justified in thinking credences are real.

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[45] Of course, other things matter too, namely, what will happen if one doesn't take the bet and one's risk aversion. I would risk not finishing this paper if I didn't bet on my brakes, but I risk nothing except the opportunity for more cash by not betting on the Eagles.

[46] At least, if we abstract out any risk that the lottery is fraudulent or that the tickets were misprinted so that none has the winning numbers, etc.

[47] MICHAEL TITELBAUM, FUNDAMENTALS OF BAYESIAN EPISTEMOLOGY 1, 35–37 (2020).

With credences on the table, Bayesians then argue for various norms for credences via Dutch Book or accuracy-dominance arguments. A Dutch Book argument is a demonstration that if an agent's credences violate a given norm, then there is a series of bets each of which the agent should take given his credences, but which taken together guarantee that the agent will lose money.[48] Since taking such bets is irrational, and the agent's credences say to take them, the agent's credences are irrational. And since failure to adhere to the suggested norm is what makes the agent's credences irrational, rational agents will adhere to the norm. Accuracy-dominance arguments give a method of scoring credences (some measure of the distance of the credence from 0 for false propositions and from 1 for true propositions), then show that for any set of credences that violates the norm, there's a set that scores better on the relevant measure because it doesn't violate the norm.[49] Since credences aim at accuracy, a rational agent will not adopt credences that are necessarily less accurate than they could be. So rational agents will adhere to the norm. Or so goes the Bayesian argument at least.

But some traditional epistemologists have objected that Bayesian epistemology is psychologically unrealistic for a variety of reasons.[50] Only one such objection is relevant to our

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[48] Hanti Lin, *Bayesian Epistemology*, STANFORD ENCYCLOPEDIA OF PHILOSOPHY § 1.6 (Edward N. Zalta ed., June 13, 2022), https://plato.stanford.edu/entries/epistemology-bayesian/; see also, Susan Vineberg, *Dutch Book Arguments*, STANFORD ENCYCLOPEDIA OF PHILOSOPHY (Edward N. Zalta ed., May 14, 2022), https://plato.stanford.edu/entries/dutch-book/#BasiDutcBookArguForProb. Note that Dutch Book arguments assume something like this principle: a rational agent with cr(P) = a will take any bet that promises to pay $100 if some proposition P is true and costs $100 * a or less. I say "something like" because there are refinements to account for agents with greater risk aversion (e.g., perhaps it is your last $100 and you need every dollar to get home to see your dying father). I do not foreground this because it doesn't strike me as necessary to the explication and the truth of the assumption does not affect my argument.

[49] Lin, *Bayesian Epistemology*, § 1.7.

[50] Bayesian epistemology often proceeds by assigning precise numerical credences to every proposition and deriving norms based on what would yield inconsistencies somewhere in this set – essentially modeling a logically omniscient and unbounded agent with a complete set of precise credences. Bayesians typically respond to the omniscience, unboundedness, and completeness worries by arguing that they are looking to an ideal to derive norms that we should approximate insofar as we can, not attempting to give a descriptively accurate account of human reasoning, and showing how real agents can be expected to live up to the norms in partial ways. See, e.g., Terrence Horgan, *Troubles for Bayesian Formal Epistemology*, 94 RES PHILOSOPHICA 233 (2017); Lin, *Bayesian Epistemology*, § 6; Seamus Bradley, *Imprecise Probabilities*, STANFORD ENCYCLOPEDIA OF PHILOSOPHY (Edward N. Zalta ed., Feb. 19, 2019), https://plato.stanford.edu/entries/imprecise-probabilities/. For some representative responses, see, e.g., MICHAEL TITELBAUM, FUNDAMENTALS OF BAYESIAN EPISTEMOLOGY II, 428–39 (2022); Lin, *Bayesian Epistemology*, § 6; Jonah Schupbach, *Troubles for Bayesian Formal Epistemology? A Response to Horgan*, 95 RES PHILOSOPHICA 189 (2018).

purposes, viz., the objection to the precision of credence values. Bayesians often talk as if agents have credences of precise numerical values in every proposition we might consider, but can we really say that some agent has credence of 0.67 in the pedestrian propositions that his keys are on the rack or that his wife is at Target?[51] Why not 0.68 or 0.669? How could we possibly arrive at such precision? If what we are trying to do is model the confidence levels of real agents (or the weight of principles grounded in the kind of social facts underlying the law on Berman's principled positivism), such precision is rarely if ever going to be justified. And if this precision is generally not present, any decision theory that depends on precise credences will be imperiled too.

b. Advanced Bayesian Defensive Tactics

Some Bayesians attempt to justify precise credences by arguing that we can define or measure credences by an agent's betting dispositions. The idea is that rational agents for whom $cr(P) = x$ will take bets that promise to pay out $100 if they cost $100 * x$ or less.[52] After all, if the agent's credences are accurate (which agents tend to assume, else they'd change their credences), then the agent will tend to make money on such bets in the long run (and therefore maximize expected utility). And if that's true, then for any proposition and agent, we can in principle determine a quantitative credence. But attempts to *define* credences in terms of dispositions to bet fail for the usual reasons that behaviorist definitions of mental states fail[53] and attempts to *measure* credences by betting behavior don't fare much better because (1) in most situations there's no reason to think an agent forced to choose a price at which to take a bet is doing more than guessing more or less randomly and (2) betting behavior

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[51] The contrast to pedestrian propositions I'm implying here is those that, like the lottery paradox or forced bets, lend themselves to precise quantification in an obvious way.

[52] Note that this view was not developed in response to the objection that precise credences are unrealistic – it goes back to Frank Ramsey's definition of degrees of belief in his 1926 essay, *Truth and Probability*. But it is something Bayesians have used to respond to the objection.

[53] See RODERICK CHISHOLM, PERCEIVING (1957); Hilary Putnam, *Brains and Behavior, in* ANALYTIC PHILOSOPHY (R. Butler ed., 1965).

alone fails to account for the variance in risk aversion across agents.[54] Nor is this method likely to be useful in law, where what we are interested in is not a feature of the psychology of any particular legal agent. What would the correlate of an individual's betting dispositions be for the legal system as a whole or even subset such as judges?

Two other responses by Bayesians hold more promise (both for epistemologists and for us). The first takes credences generally to be imprecise, that is to be best represented by a range of values. The second takes the fundamental epistemic concept to be comparative confidence relations with numerical credences as a derivative phenomenon that exists if at all in largely artificial scenarios such as the Lottery Paradox that lend themselves to quantification. Both views fit well with Berman's assertion that we should expect principles to have only rough weights and to the extent these views succeed, they provide some proof of concept that we can get determinate answers to decisions from a system without precise weights.

i. Imprecise Credences

On versions of Bayesianism that use imprecise credences, an agent's credences are modeled with a set of probability functions, called the agent's "representor." One's representor can combine with preferences to rationalize decisions in much the same way that a single precise credence can except that, instead of considering the expected value of various outcomes based on one's single-valued credence in each, one must consider the expected value for each probability function in the agent's representor. When the expected value of each outcome of a course of action A is higher on each of the probability functions in an agent's representor than the alternative course of action B is on any such function, A will be rationally required and B rationally prohibited – "choose non-

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[54] Consider an agent with strict moral scruples about gambling. Such a person would seem to have no betting dispositions at all. For a more thorough discussion and attempt to model risk aversion in betting behavior, *see* Sven Neth, *Measuring Belief and Risk Attitude*, 297 ELECTRONIC PROCEEDINGS IN THEORETICAL AND COMPUTER SCIENCE 354 (2019).

dominated acts" is a clear rational constraint on choice in any decision theory.[55] Of course, when the expected value of some outcomes of *A* are greater than *B* on some probability functions and less on others, the rational constraints are less clear and when the probabilities are maximally imprecise (ranging from 0 to 1), an agent's credences and preferences may provide no guidance at all. Critics have argued that this failure of action guidance is a defect of the imprecise credence view, but proponents argue that this is a feature, not a bug because part of the point of moving from precise to imprecise credences is to increase the psychological realism of the view and actual reasoners find themselves in situations where their preferences and epistemic states make prospects incompatible.

Although an epistemology of imprecise credences faces real problems, including developing a satisfying scoring method (such as those used in accuracy dominance arguments), it is a highly successful research program, with applications in a range of fields including psychology, economics, engineering, and physics[56] and consistent progress is being made in addressing its current defects.[57]

ii.   Comparative Confidence Relations

Another response to the challenge that precise credences are psychologically unrealistic is to move to an epistemology based on comparative confidence relations.[58] The basic notion here is the "at least as confident as" relation. An agent's being at least as confident in a proposition *P* as she is in another proposition *Q* is often represented as $P \geq Q$. An agent's being equally confident in *P* and *Q* is then defined as $(P \geq Q \ \& \ Q \geq P)$, an agent's being more confident in *P* than *Q* is defined as $(P \geq Q \ \& \ Q \not\geq P)$, and an agent's having no comparative confidence as between P and Q is defined as $(P \not\geq Q \ \& \ Q \not\geq P)$.[59]

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[55] See Yoaav Isaacs, Alan Hájek, and John Hawthorne, *Non-Measurability, Imprecise Credences, and Imprecise Chances*, 131 MIND 892, 905 (2022).

[56] *See* Bradley, *Imprecise Probabilities*, § 1.

[57] *See id.*, § 3.6.

[58] These are sometimes called comparative beliefs, but that muddies the water as they are not beliefs with the content that some proposition is more likely than another.

[59] *See* TITELBAUM, FUNDAMENTALS OF BAYESIAN EPISTEMOLOGY II, Ch. 14 for further explanation and notation.

Orri Stefansson argues that comparative confidence relations are fundamental because even when an agent has numerical credences, it is the comparative relation that is doing the real work in explaining differences in behavior (other things being equal).[60] If I am looking for my keys, I will look on the table by the door before I look in the couch cushions because I am more confident the keys are by the door than between the cushions, regardless of exactly how confident I am in each (assuming equal cost to searching in either place).[61] Comparative relations are necessary and sufficient to explain behavior, but numerical credences are neither necessary nor sufficient – they are just ways of showing what the comparative relations are. Given that the role of mental states in explaining behavior and cognition is what justifies us in positing their existence and that we can't dispense with comparative confidence relations or reduce them to numerical credences (or anything else), we are justified in believing that comparative confidence relations exist and are fundamental.

Not only are there good reasons to think comparative confidence relations are more fundamental, but Stefansson has also shown that systems of such relations can be represented by precise credences if they meet certain conditions such as transitivity, i.e., (P ≥ Q & Q ≥ R) → P ≥ R, and completeness, i.e., for all P and Q in the system, there is some comparative relation between P and Q.[62] While there is no unique such representation (if there were we'd have reason to think the

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[60] H. Orri Stefansson, *What Is Real in Probabilism*, 95 AUSTRALASIAN JOURNAL OF PHILOSOPHY 573 (2017); *see also* Jason Konek, *Comparative Probabilities*, *in* THE OPEN HANDBOOK OF FORMAL EPISTEMOLOGY (R. Pettigrew, & J. Weisberg eds. 2019).

[61] I have come to think Stefansson's argument is wrongheaded, for reasons suggested by the parenthetical in the text above (how could comparative relations alone explain the marginal utility of searching the couch v. searching the bowl, when that depends not just on one requiring more work than the other or my being more confident the keys are in one location than the other, but how much more work is required and how much more confident I am?) and a conceptual reason (what would it mean for there to be comparative relations between confidence levels without those confidence levels having any particular value?). I return to this point below.

[62] The other individually necessary and jointly sufficient conditions are Qualitative Additivity, Normality, and Suppes Continuity. These are difficult to explain without explaining basic set theory and notation, which time and space do not permit. It is also not clear how these would be adapted to discussion of the weight of legal principles. In Bayesian epistemology, they are defined in terms of sets of possible worlds at which the relevant proposition is true. Perhaps we could define them in terms of possible cases in which the principle would be relevant to the answer or sets of possible cases in which but for the principle in question, the verdict would have been different. I leave this as a project for another day.

agent had precise credences after all), such representations may still be useful for illustrating things about the agent's comparative beliefs, so long as the operations performed on them would not differ if performed on other equally valid precise representations.[63, 64] Probabilistic representability also allows the comparativist to avoid Dutch Book and accuracy dominance arguments.[65]

Moreover, John Welch has shown that comparative confidence relations and comparative preferences can be incorporated into a decision theory that yields some action guidance between finite numbers of options.[66] If faced with a choice between two actions A_1 and A_2, there are nine possible ways to assign >, <, or = to the probability that each action will produce its expected outcome and the utility of each act's expected outcome. Six of the nine possible combinations yield decisive action guidance, as illustrated in the table below (which I've taken with slight modification from Welch's paper).[67]

Combination	Probability	Utility	Guidance
1	$A_1 < A_2$	$A_1 < A_2$	Choose A_2
2	$A_1 < A_2$	$A_1 > A_2$	None
3	$A_1 < A_2$	$A_1 = A_2$	Choose A_2
4	$A_1 > A_2$	$A_1 < A_2$	None
5	$A_1 > A_2$	$A_1 > A_2$	Choose A_1

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[63] See Stefanssón, *What Is Real in Probabilism*, at 576-582 (arguing that these representations preserve the cardinal facts about the comparative relations); *but see* Edward Elliot, *Comparativism and the Measurement of Partial Belief*, 87 ERKENNTNIS 2843 (2022) (arguing that transformations on such representations do not preserve meaningful cardinal information, so we cannot read such information off of any given representation).

[64] "Epistemologists sometimes complain that working with numerical credences is unrealistic, because agents "don't have numbers in their heads". This is a bit like refusing to measure gas samples with numerical temperature values because molecules don't fly around with numbers pinned to their backs. The relevant question is whether agents' doxastic attitude sets have a structure that can be well represented by numbers, by a comparative ranking, by classificatory concepts, or by something else. This is the context in which it's appropriate to worry whether agents' confidence gaps have important size characteristics, or whether an agent's assigning doxastic attitudes to any two propositions should automatically make them confidence-commensurable." TITELBAUM, FUNDAMENTALS OF BAYESIAN EPISTEMOLOGY I, at 14.

[65] See Stefanssón, *What Is Real in Probabilism*, at 583-86.

[66] John Welch, *Coping with Ethical Uncertainty*, 53 DIAMETROS 150 (2017).

[67] *Id.* at 157.

6	$A_1 > A_2$	$A_1 = A_2$	Choose A_1
7	$A_1 = A_2$	$A_1 < A_2$	Choose A_2
8	$A_1 = A_2$	$A_1 > A_2$	Choose A_1
9	$A_1 = A_2$	$A_1 = A_2$	None

We can use this procedure to decide among a larger set of options by running a series of binary comparisons between the options with the winning option in each moving on to the next comparison, until we get through each option.[68] To illustrate, assume we face a choice among four actions, A_1 to A_4. To see which action (if any) we ought to choose, we first compare A_1 and A_2 as illustrated in the table above.[69] Suppose considerations of plausibility and utility favor A_2. We therefore eliminate A_1 and move on to compare A_2 to A_3. Again, suppose plausibility and utility favor A_2. We thus eliminate the loser, A_3, and move on to compare the winner to A_4. Suppose plausibility and utility favor A_4 this time. We then eliminate A_2 and conclude that A_4 is the best option. Assuming >, <, and = relations are transitive, it does not matter with which pair we began: the last action standing will be the one Welch's decision theory favors (here, A_4 beats A_2; A_2 beats A_1 and A_3; so, A_4 beats A_1 and A_3).

iii. Evaluation of the Defensive Tactics

Both views make great strides against the psychological realism objection to precise numerical credences. One way to see this is to think about your own attitude toward a variety of propositions. It's hard to confidently introspect a precise quantitative credence in many propositions, but much less difficult to confidently identify a range that roughly captures one's confidence level or to say whether one is more confident in one proposition than another. We may not always be capable of doing this, but we can do so in many more cases than for precise credences. For example, I'm quite sure that my

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[68] *Id.* at 162.
[69]

confidence in the existence of God is somewhere between 0.7 and 0.9 and that it's greater than my confidence that no existing state has real political authority but less than my confidence that my in-laws are generous, kind-hearted people.

But perhaps you distrust introspection. Still, we can more easily imagine a rational basis in observable behavior for attributing imprecise credences and comparative confidence relations than for precise credences. If we observe that a particular person goes to temple each Sabbath, by and large adheres to the rules in the Torah, and is disposed to affirm the existence of YHWH, but admits to occasional doubt, any precise credence in the existence of YHWH seems arbitrary. What about these observations could justify a credence of 0.8 as opposed to 0.85? But based on these facts, attributing to the agent a ranged credence with a lower bound above 0.5 and an upper bound below 1 or attributing a state of greater confidence that YHWH exists than that Zeus does seems well justified, perhaps even rationally required absent other evidence.[70]

Further, both views allow for agents with incomparable confidence levels, being neither more confident in one or the other nor equally confident, unlike precise numerical credences which are inherently comparable wherever they exist.[71] This adds to the psychological realism of the view because it seems likely that real agents do sometimes have such confidence levels. Taking an example from Michael Titelbaum, one might be more confident that it will rain tomorrow than that it will shine

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[70] That is not to say there's no value to using precise credences at times. For example, one might set the rational credence for an agent given certain evidence to some quite conservative value and then show that even on the assumptions of a confidence level that is surely within the justified range for various pieces of evidence, interesting conclusions follow. For an interesting – though obviously controversial – example of this, see RICHARD SWINBURNE, THE EXISTENCE OF GOD (2004) and THE RESURRECTION OF GOD INCARNATE (2003) (arguing that on conservative assumptions about the value of various pieces of evidence we can be very confident that God exists and that Jesus rose from the dead). But this is using precise credences to simplify calculations and show that the lower bound of the range of rational credences one might have is high, and doesn't do anything to show that real agents have such credences.

[71] But note that the comparativist view has to give up completeness and thus probabilistic representability to do so. It might retain a weaker feature that would serve much the same purpose if it is extensible to a probabilistically representable system, mirroring a move by precise Bayesians in response to the objection that it's implausible that agents have a credence in every proposition. See Lin, *Bayesian Epistemology*, § 3.1; TITELBAUM, FUNDAMENTALS OF BAYESIAN EPISTEMOLOGY II, 496-505.

and one might be more confident that there is intelligent extraterrestrial life somewhere in the universe than not, but one might not be able to say whether one is more confident in rain than in the existence of intelligent extraterrestrials. Generalizing, it appears that when we have one base of evidence that we understand to bear on P or Q and a separate base of evidence that we understand to bear on R or S, but no idea how to rate the two bases of evidence on some common scale, we can be more confident in P than Q and R than S but lack any comparative confidence as between P and R. Because such situations seem quite plausible given our psychology, imprecise and comparativist epistemologies both turn out to be more psychologically realistic than precise Bayesianism. So much for the challenges to precise Bayesianism and the Bayesian responses. What can we learn about the prospects of principled positivism from this foray rather far afield?

4. Repelling the Assault on Principled Positivism

a. Stage One: The Success of Bayesian Responses Blunts the Challenge

First, note that the objection against principled positivism that our legal materials are too impoverished to allow us to assign precise weights to principles is highly analogous to the challenge to Bayesian epistemology that human psychology and behavior is too impoverished to allow us to assign precise numerical credences to agents. To the extent that Bayesians can successfully respond to the challenge in ways that seem adaptable to legal principles, the force of the challenge to principled positivism is diminished, even if the objection is not fully answered. When choosing between theories, an objection that looks unanswerable should weigh more heavily in the decision than an objection that is unanswered but looks plausibly answerable.

The question then becomes: What are the prospects for adapting the Bayesian moves to the theory of jurisprudence?

b. Stage Two: Beginnings of a Thoroughgoing Defense

Consider first imprecise credences. Can we plausibly give ranged values to principles and to their degree of activation? Doing so will require adopting some scale. We could perhaps pick some zero and some arbitrary positive number, or we might try to determine the scale in a more principled way by looking to another tool used by some decision theorists to create a scale and determine the cardinality of an agent's preferences. Here's the idea in decision-theoretic terms: First, identify the agent's least and most valued options. Call these A and Z. Set those to 0 and 1 respectively. Then for each other option, identify the odds at which the agent would give up certainty of having the option in question in exchange for a ticket in the lottery. The odds at which the agent would go for the lottery represent the point along the scale from A to Z that the option in question occupies.[72]

Here's a pass at how we might adapt this to legal principles. If we could determine an ordering of the principles, we could set the weight of the strongest principle P_{MAX} to 1 and the weakest principle P_{MIN} to 0 as the endpoints of the scale. For each other principle P_i, we could imagine that the most informed members of the legal community are on one side of the case and will be executed if they lose. We could then ask at what odds they would give up certainty of having P_i support their case in exchange for the chance of having P_{MAX} on their side despite the risk of being left with only P_{MIN}. Then we could place P_i that far along the distance between 0 and 1.

Unfortunately, this is not likely to work. Not only does this idea face the technical (but likely surmountable) challenge of accounting for the dimension of activation and for the effect of the burden of proof, but it also faces what appears to be an insurmountable conceptual challenge. Appealing to (real or hypothetical) legal experts to set the weight of principles only pushes the problem back a step.

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[72] Steele and Stefansson, *Decision Theory*, § 2.2.

There must be some underlying facts about the legal system that the experts track in placing their bets and the question becomes what underlying facts could justify the experts' decisions.

Perhaps we can give reasonable imprecise values to the principles more directly, by looking at the social facts that ground them. After all, these facts do look quite like those we might base imprecise credences on. Just as we attribute credences to individuals based on what makes the most sense of their actions given what we know about their preferences or about normal preferences, so too we may attribute some ranged weight and activation value to principles that best explains their use in various legal decisions.

For example, if we see someone drive to a coffeeshop, we assume a relatively normal set of preferences (coffee is not nearly as valuable as one's life) and infer that he is highly confident that his brakes work because otherwise his preferences would make his behavior irrational. If we read a line of cases in which the majority opinion invokes Our Federalism to reach one answer against a rotating cast of other principles championed in the dissents, we can be confident in assigning federalism a higher weight than those other principles because the decisions would not make sense otherwise. If the dissents argue, e.g., that some authoritative text clearly mandates a different verdict than the majority gives, the majority's response to this argument will be telling also: if the majority acknowledges that the text requires that answer and still goes with the answer supported by Our Federalism, we have a basis for assigning greater weight to the federalism principle than to the textual principle; but if the majority simply raises doubts as to whether the legal content of the text is what the dissent claims, we have a basis for only for assigning greater weight to the federalist principle than to the textual principle at some diminished level of activation – and arguably we also have a basis for attributing greater weight to the textual principle than to the federalism principle.[73]

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[73] One would expect the majority not to waste time raising these doubts if there's no need to do so to get to their conclusion or at least to take the belt-and-suspenders approach, saying "and even if the text has the legal content you say it does, our view is right." If the majority raises doubts about the text without taking the belt-and-

One might worry that the relevant legal speech acts don't allow us to discriminate the force due to a principle's weight and the force due to its activation even using imprecise values. If all we had were invocations of principles and an announcement of the legal status of some act, then that might be true. But often we do get statements that guide and constrain the assignment of values to the weight and activation of principles separately, even quite explicit ones.

In *Stone v. Powell*, the Court considered whether to apply the exclusionary rule for Fourth Amendment violations to habeas proceedings.[74] Reviewing relevant precedents, the majority argued that the exclusionary rule is a prophylactic rule adopted to create a deterrent that would protect Fourth Amendment values, not a constitutionally-mandated requirement or a rule intended to exclude low-quality evidence. Thus, the majority reasoned that the answer to the question presented was "to be found by weighing the utility of the exclusionary rule against the costs of extending it to collateral review of Fourth Amendment claims."[75] After reviewing the costs, including the diminished reliability of proceedings from which probative evidence is excluded and the lack of proportion between the error made by the police vis-á-vis the benefit given to the defendant, the majority noted that there would be little if any effect on the power of the exclusionary rule as a deterrent if it were not applied to habeas proceedings.[76] Thus, we see the court arraying various principles on the side of not applying the exclusionary rule (accuracy of adjudication matters, proportionality matters, and text matters) and stating plainly that the primary principle that favored applying the rule (purpose matters) was barely activated if at all.

In fact, the Supreme Court's jurisprudence even lays out the factors that determine the activation level for some principles. Take for example the principle of *stare decisis*. Justice Kennedy laid

suspenders approach, there's arguably a Gricean implicature from the maxim of quantity that the text matters more than federalism. *See* H.P. GRICE, *Logic and Conversation*, in SYNTAX AND SEMANTICS VOL. 3, 45 (1975).

[74] 428 U.S. 465 (1976).

[75] *Id.* at 490.

[76] *Id.* at 493.

out some of the factors that determine the activation level of this principle clearly in *Planned Parenthood v. Casey*: the degree to which the prior rule has proved unworkable; the degree to which the prior rule has created reliance interests; and the extent to which relevant changes in the law, the facts, or our understanding of the facts have undercut the application or justification of the old rule.[77] *Dobbs v. Jackson* set out a few more, specifically, the nature of the error (whether the Court's error was a usurpation of the power to address questions of profound moral and social importance), the extent to which the reasoning of the case is patently inadequate, and the extent to which the prior rule had a disruptive effect on other areas of the law.[78]

If all this is remotely on track, we should be optimistic that we can reasonably assign rough weights and activation values to principles from the legal materials available.[79] But the question remains whether these could be aggregated and whether they would yield a determinate answer in enough cases. The aggregation of principles with imprecise values would not be much more complex than aggregating principles with precise weights. To show that we can get some determinate answers, all we need do is compare the maximal values for the weight and activation of principles on one side to the minimal values for the weight and activation of the principles on the other. If even on this comparison, the side for which we've used the minimal values wins, then we know that side wins on all possible assignments of weight and activation values. To illustrate, we can

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[77] 505 U.S. 833, 854-55 (1992).

[78] 142 S.Ct. 2228, 2265 (2022).

[79] Here's an additional reason to think we can non-arbitrarily, if only roughly, assign weights to principles: the example of gymnastics judges. These judges take in a performance and spit out precise numbers across several categories to score performances. They have some guidance based on pre-established degrees of difficulty and knowledge of what moves should look like/what the standards of excellent execution are from their observation of the sport. And they apply a two-dimensional framework that's actually a lot like Berman's. The degree of difficulty corresponds to weight in some sense and degree of execution corresponds to the level of activation. Yet no one thinks the precise numbers they give are totally arbitrary even though there's nothing in the performances they judge that lends itself to clear, precise quantification. No one thinks that there's zero correlation between who performed best according to some real, if hard to articulate, standard and who's on the podium at the end. Why should we think the decisions of judges in our legal system are any different?

use a modified form of the vector addition that Berman employs as displayed in the following

diagrams.
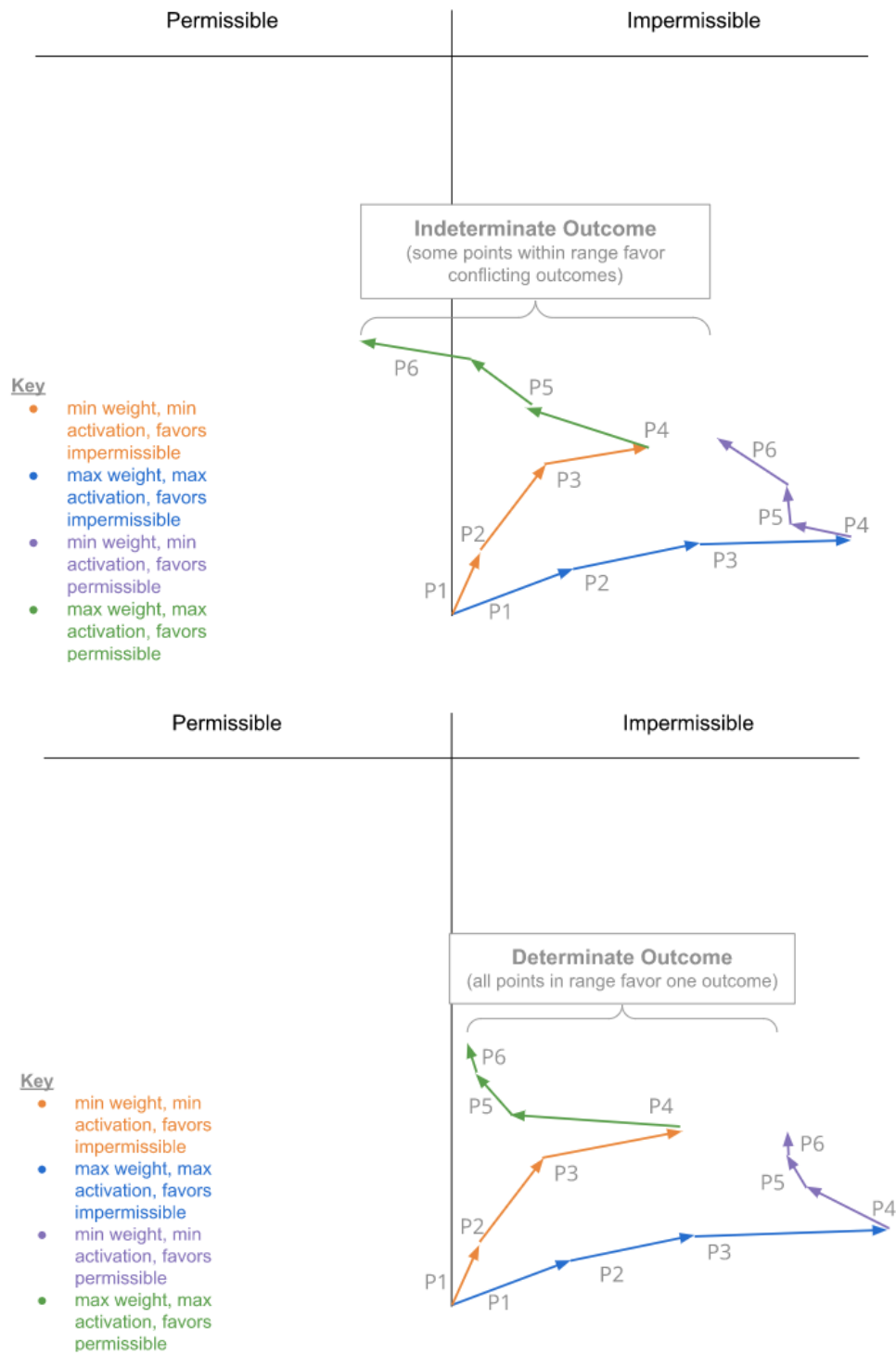
In the diagrams, the length of the arrow represents the weight of the principle and the angle of the arrow represents the activation level ($0°$ = no activation, $+/- 90°$ = full activation). When all points within the range that results from the vector addition are on one side of the midline, the principles jointly yield a definitive answer.[80] When the range includes points on both sides of the midline, there is some uncertainty as to whether the principles yield a definitive answer. The proportion of the range that is on each side represents the probability that the principles support that answer (if we think the imprecision is due only to epistemic deficiencies) or the degree to which the principles support that answer (if we think the imprecision exists because the weights and activation values really are indeterminate). In either case, the presence of uncertainty or indeterminacy mean we have to say there is no answer at all. If 75% of the range is on the "permissible" side, it seems reasonable to say that "permissible" is a better answer than "impermissible." So, we are not forced to say that we can get reasonable answers to questions only when the entire range is on one side. Thus, while this is not a demonstration – for that we would have to spend much time and many pages working through particular cases, positing ranges for the values that best explain the decision, and testing them against further cases – the prospects for principled positivism using imprecise weights and activation values look promising.

Even if we cannot assign rough weight and activation values and must make do with comparative relations alone, principled positivism could yield some answers. Suppose that there are

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[80] While there will be other combinations of the maximum and minimum weight and activation values, those combinations will necessarily fall within the boundaries set by the values illustrated above because net of the leftmost point will be the maximum values for the principles favoring permissible and the minimum values for the principles favoring impermissible while the rightmost point will be set by the net of minimum values for permissible and maximum values for impermissible. The other combinations (particularly min-min/min-min and max-max/max-max) might be useful for defining some notion of the ranges central value that could be used to argue there's a determinate answer in even more cases than those in which both outer boundaries fall on one side of the permissible/impermissible line (e.g., when this central value is on one side or the other). But for my purposes, which was to show that imprecise weights don't foreclose determinate answers, the outer boundaries are all that need be charted. And the ordering of the other possible combinations will be case specific, so charting them here seemed likely to add complexity without adding clarity or understanding.

four relevant legal principles, P_1–P_4 and we know that $P_1 > P_2 > P_3 > P_4$. In eleven out of sixteen possible cases, we would still get a determinate result, as demonstrated in the table below.

Case	Permissible	Result	Impermissible
1	P_1, P_2, P_3, P_4	>	
2		<	P_1, P_2, P_3, P_4
3	P_1	?	P_2, P_3, P_4
4	P_1, P_2	>	P_3, P_4
5	P_1, P_3	?	P_2, P_4
6	P_1, P_4	?	P_2, P_3
7	P_1, P_2, P_3	>	P_4
8	P_1, P_2, P_4	>	P_3
9	P_1, P_3, P_4	>	P_2
10	P_2	<	P_1, P_3, P_4
11	P_2, P_3	?	P_1, P_4
12	P_2, P_4	<	P_1, P_3
13	P_2, P_3, P_4	?	P_1
14	P_3	<	P_1, P_2, P_4
15	P_1, P_2	<	P_1, P_2
16	P_4	<	P_1, P_2, P_3

In these eleven cases, either all the principles stack up on one side or, for each principle on one side, there's a weightier one on the other (in game-theoretic terms, one side strictly dominates the other). For example, in Case 4, P_1 outweighs P_3 and P_2 outweighs P_4, so the balance must tip in favor of "permissible." In the other five, we cannot determine which set of principles is weightier because we have no way to determine how much weightier one principle is than another. For example, in Case 3, we know P_1 outweighs P_2, but we don't know if it does so by more than the combined weight of P_3 and P_4. And even if the principles are all of equal weight, we still get determinate answers in ten of sixteen cases (all the cases in which more principles are on one side than the other). And if all we know is that P_1 is outweighs any other individual principle, we still get determinate in answers in half

the cases (Cases 1, 2, 7, 8, 9, 10, 14, and 16). Thus, there are reasonable prospects for generating some determinate answers if we can simply identify comparative relations between the principles in a given case.

However, it is hard to see why these comparative relations would obtain if there's nothing there to compare. Could we really have a principle that exerts greater force than another if there's no amount of force that either principle exerts? In virtue of what would we be saying that the one outweighs the other? On a theory that posits weight and activation values, we can explain the comparative relations between principles. On a theory without such values, the comparative relations appear to be brute facts. That strikes me as too high theoretical price to pay and militates strongly in favor of a view that works with imprecise weight and activation values rather than merely comparative relations.

5. Conclusion: Taking Stock and Taking Aim

Principled positivism needs there to be some way to evaluate and aggregate the force that various legal principles exert on the answer to legal questions. While the assignment of precise weights looks fairly hopeless given the kind and quantity of social facts that ground legal principles, I hope to have shown that the success of Bayesian epistemologists in answering similar challenges acts as a sort of proof of concept, taking some of the force out of the objection that we cannot reasonably assign weights to principles, and further that some of the Bayesian responses may provide inspiration for analogous moves by which principled positivists ultimately defeat the objection. But I do not pretend to have carried through the project of defeating the objection here. What remains to be done is to undertake the long and arduous process of examining cases, developing sets of rough weights and methods of determining rough activation levels, then showing that these have predictive/explanatory power. I leave that more ambitious project to those with time, will, and intellect enough to complete it.