

# Probabilistic Promotion Revisited

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**Abstract:** Promotion is the relation between an act and a desire that obtains when the act advances or serves the desire. Under what conditions does an act promote a desire? *Probabilistic accounts of promotion*, the most prominent accounts, analyze promotion in terms of an increase in the probability of the desire's satisfaction. In this paper, we clarify the promotion relation and explain why probabilistic accounts are attractive. Then we identify two questions probabilistic accounts must answer: the *Baseline Question* and the *Interpretation Question*. We discuss and reject the three answers to the Baseline Question found in the literature, and explain the challenge future attempts at answering this question will face. Proponents of probabilistic accounts have not adequately addressed the Interpretation Question. We survey three answers to this question, finding each unsatisfactory. We conclude that no satisfactory probabilistic account has yet been offered, and that there are significant hurdles to providing one in the future.

## 1. Introduction

Behaving in certain ways can *promote*, *serve*, or *advance* one's desires, while possibly falling short of satisfying them. Under what conditions does an act promote a desire? *Probabilistic accounts*, the most prominent theories of promotion, analyze promotion in terms of an increase in the probability of a desire's object.<sup>1</sup>

In this paper, we do several things. First, in §2, we clarify the promotion relation by identifying some of its important features and explaining what theoretical roles it may play. In §3, we argue that probabilistic accounts are attractive because they appear well-suited to explaining these features and roles. In §4, we discuss three probabilistic accounts of promotion. We briefly review earlier criticisms of the first two accounts. Then, we consider and reject a recent diagnosis of why they fail, and we argue against the third account. In §5,

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<sup>1</sup> So far as we are aware, the earliest probabilistic accounts are due to Stephen Finlay (2006) and Mark Schroeder (2007). Similar probabilistic approaches to the development of principles that capture the transmission of reasons to perform an end to reasons to perform the means to it have also been discussed in the philosophical literature. For more on that issue, see the excellent discussion by Niko Kolodny (forthcoming). We attempt here to treat promotion as a relation that is in principle independent of its importance for developing a theory of instrumental reasons, though we recognize and discuss the relationship between promotion and instrumental reasons below.

we raise a challenge to probabilistic accounts that hasn't been adequately addressed, namely, the problem of specifying the kind of probability relevant to promotion, and we describe some potential problems for each of the possible responses to this challenge. §6 briefly concludes. If successful, the arguments in the paper will show that no satisfactory probabilistic account has yet been offered, and that there are significant hurdles to providing one in the future.

## 2. The Promotion Relation

To get a handle on the notion of promotion, consider some examples:

*Breakfast:* Al wakes up hungry, wanting to eat breakfast. He could go out to eat, make eggs, make pancakes, or skip breakfast. He makes himself pancakes.

*College:* Beth wants to attend an Ivy League to earn her degree. Knowing that one must apply to do so, Beth applies to Ivy Leagues.

*Itch:* Cate has an itch on her head that she wants to go away. She scratches it, and it goes away.

*Lottery 1:* Dean wants to win a fair 10 ticket lottery. His only options are: buy no tickets, two tickets, or three tickets. If he buys no tickets, Ed will buy him one ticket. Dean buys two tickets.

These are paradigmatic cases of promotion. Intuitively, each agent performs an action that promotes his or her respective desire.

The promotion relation is important mainly because of its relation to normativity and reasons. Many philosophers endorse something like the following principle:

**REASONS:** There is a reason for  $S$  to  $A$  iff  $S$ 's  $A$ -ing would promote some  $X$  of the relevant kind.<sup>2</sup>

Humeans about normative reasons accept REASONS as applied to desires.<sup>3</sup> Some non-Humeans about normative reasons accept REASONS as applied to other things (e.g., objective values). REASONS is interesting in its own right, but it also inherits interest from its relation to the following principle:

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<sup>2</sup> See Snedegar (2014) for discussion.

<sup>3</sup> See Schroeder (2007).

**MORAL RATIONALISM:** *S* is morally obligated to *A* only if there is a reason for *S* to *A*.<sup>4</sup>

Together, these two principles entail:

**MORAL PROMOTIONALISM:** *S* is morally obligated to *A* only if *S*'s *A*-ing would promote some *X* of the relevant kind.<sup>5</sup>

If REASONS and MORAL RATIONALISM are both true, then the promotion relation plays a central role in morality: moral obligation depends on promotion.

Even if REASONS and MORAL RATIONALISM are both false, though, promotion is still significant. For even if an error theory of normative reasons and morality is correct, there is still a kind of reason that is related to promotion of which we will want a complete theory: an instrumental, but non-normative reason. Jonas Olson brings this kind of reason to light while defending his preferred version of a normative error theory.<sup>6</sup> Even if there are no reasons of the “counting in favor of” sort, he explains, there are nonetheless certain actions that will be instrumentally beneficial vis-à-vis our desires, goals, and so on; it makes sense to talk of our instrumental reasons to perform those actions, Olson contends, even if all that such claims amount to are claims about the instrumentality of the actions in question. But determining *which* actions really are instrumental requires a theory of promotion in order to fill out the following principle:

**INSTRUMENTAL REASONS:** There is an instrumental reason for *S* to *A* iff *S*'s *A*-ing would promote the object of one of *S*'s desires.

Given that INSTRUMENTAL REASONS should be accepted by everyone – even by the most thoroughgoing normative error theorists – promotion has an important role to play

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<sup>4</sup> The name ‘moral rationalism’ is potentially misleading, as several different kinds of theses share it. The kind of moral rationalism with which we are concerned is not one that is rationalist in the *epistemic* sense, and neither is it one that necessarily links morality with *rationality*. Rather, the principle concerns a link between the existence of moral obligations and the existence of normative reasons. We take the principle to be of the sort discussed by Russ Shafer-Landau (2003: chapter 8), and David Enoch (2011: chapter 4), for example. See also discussion from Eden Lin (2015) regarding the relationship between MORAL RATIONALISM and Schroeder’s account of practical reasons. For a discussion of a rationalist thesis of the same *kind* as that mentioned in the main text here, but of greater *strength*, see Portmore (2011).

<sup>5</sup> Schroeder (2007).

<sup>6</sup> Olson (2011: 77 – 78).

independent of the truth of more substantive principles like REASONS and MORAL RATIONALISM.

The promotion relation may also be relevant to action theory insofar as one's *beliefs* about whether a particular action promotes a particular desire might plausibly be offered in an explanation of one's behavior. In explaining why some subject acts in the way that she does, it is commonplace to cite her belief that by so acting she could satisfy one of her desires. But there seems to be nothing special about *satisfaction* as such in these cases; the agent's belief that by so acting she could *promote* her desire may play as satisfactory an explanatory role.

There may be additional roles for promotion to play beyond those considered thus far.<sup>7</sup> We won't take a stand on any of these issues. We simply note that having a theory of promotion may help clarify other normative or action-theoretic concepts. We will focus on theories of desire promotion (henceforth, promotion).

Several desiderata for a theory of promotion are illustrated by the cases above. *Itch* suggests that satisfaction entails promotion. *Breakfast* and *College* suggest that an action can promote a desire without satisfying it, since making pancakes and applying to Ivy Leagues promote Al's and Beth's respective desires without satisfying them. *Breakfast* also shows that promotion is not trivial: not all actions available to agents promote their desires. *Lottery 1* suggests that promotion is subject to an ordinal scale of measurement. Dean's options are ranked based on how well each option will promote his desire: intuitively, buying two tickets better promotes his desire than buying none, and buying three better promotes his desire than buying two. This case also shows that promotion may, in some cases, be subject to an interval scale. For depending on the desire, the actions available to the agent, and the states resulting from those actions, the distances between the rankings may also be equal. Intuitively, how much better buying two tickets rather than none promotes his desire is the same as how much better buying three rather than two promotes his desire. This example is, of course, artificial, and not all cases will allow for this kind of ranking. So, a theory of promotion must *allow* the relation to be subject to both ordinal and interval rankings of actions relative to a desire, but not *require* that it always be subject to the latter.

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<sup>7</sup> We are grateful to an anonymous reviewer for suggesting to us the import of the promotion relation for action theory.

A theory of promotion should also account for the nature of the relation. Promotion is a determination relation, akin to causation, with two arguments. The first argument takes a state of affairs that involves an agent's performing some action. The second argument takes a proposition (or state of affairs).<sup>8</sup> Call the first argument the *determiner* and the second argument the *determined*. In most cases, a determination relation that takes a proposition as its determined argument makes the proposition true when the relation obtains. Suzy's causing the window to shatter by throwing a rock makes it true that the window shatters. John's brain's being in state  $x$  makes it true that his mind is in state  $y$ . Call determination relations of this sort *factive determination relations*. Promotion is not a factive determination relation. One can promote one's desire without thereby making the object of that desire true.

This discussion suggests the following six principles (let  $S$  be an agent,  $A$  be an action, and  $P$  be the object of one of  $S$ 's desires  $D$ ):

- (1) **SATISFACTION ENTAILS PROMOTION:** Necessarily, if  $S$ 's  $A$ ing satisfies  $D$ , then  $S$ 's  $A$ ing promotes  $P$ .
- (2) **PROMOTION DOES NOT ENTAIL SATISFACTION:** It's not the case that necessarily, if  $S$ 's  $A$ ing promotes  $P$ , then  $S$ 's  $A$ ing satisfies  $D$ .
- (3) **NON-TRIVIAL:** It's possible that  $S$  has an action available to her that would not promote  $P$ .<sup>9</sup>
- (4) **ORDINAL RANKING:** Promotion ranks acts relative to  $D$  on an ordinal scale.
- (5) **POSSIBLE INTERVAL RANKING:** In some, but not all cases, promotion ranks acts relative to  $D$  on an interval scale.
- (6) **NON-FACTIVE DETERMINATION:** Promotion is a non-factive determination relation.

We assume that any theory that fails to accommodate these principles is thereby at least a *prima facie* deficient theory of promotion.

### 3. Probabilistic Promotion

Probabilistic accounts of promotion satisfy the following claim:

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<sup>8</sup> We assume that this role is filled by propositions, but do so with the understanding that states of affairs may best play the determined role instead.

<sup>9</sup> As we understand it, *satisfaction* relates to *desires*, and *promotion* relates to *objects of desires*, but we will sometimes speak loosely, in terms of promotion of desires. We intend this to be shorthand for promotion of the object of those desires.

**PROBABILISTIC PROMOTION (PP):**  $S$ 's  $A$ -ing promotes  $P$  iff  $S$ 's  $A$ -ing increases the probability of  $P$ .<sup>10</sup>

These accounts are attractive because they appear to capture all of (1)-(6).

PP arguably explains features (1)-(3). Suppose that when  $S$ 's  $A$ -ing satisfies  $P$ ,  $\Pr(P)=1$ . Gina desires to complete a marathon. Since crossing the finish line satisfies her desire and the probability of that desire was less than 1 before she crossed (let us suppose), crossing the finish line increases her desire's probability. By PP, it follows that crossing the finish line promotes her desire. So PP can explain SATISFACTION ENTAILS PROMOTION.<sup>11</sup>

Suppose Gina has nearly completed the marathon, and with every step forward she increases the probability that she will finish. Intuitively, every step she takes promotes her desire to finish, even though her desire remains unsatisfied until she crosses the finish line. So, taking each step promotes her desire and increases its probability, without satisfying it. Thus, PP can explain PROMOTION DOES NOT ENTAIL SATISFACTION.

PP also explains NON-TRIVIAL: Given that Gina has plenty of actions available to her that would not increase the probability of her desire to complete a marathon (e.g., she could quit in the middle of the race), NON-TRIVIAL follows.

PP can also explain (4)-(6). Like promotion, the *increasing probability* relation is (or, at least, can be) a non-factive determination relation that can rank acts on an ordinal scale.<sup>12</sup>

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<sup>10</sup> In focusing on PP, we are focusing on “pure” probabilistic accounts of promotion, rather than “impure” probabilistic accounts, like the one Sharadin (2015) defends. An impure account appeals to some factor other than probability raising as a condition for promotion. We will not explicitly address impure accounts, except to make three notes. First, the probabilistic component of such accounts may be susceptible to the objection we level against Coates' view in §4.3. Second, without an answer to the Interpretation Question (introduced at the beginning of §4), like all other probabilistic accounts, impure accounts will be empty. Lastly, we offer considerations that count against endorsing Sharadin's account in [redacted].

<sup>11</sup> It does so only in cases in which the probability of the agent's desire is less than 1 and can be increased to 1. We flag this limitation here; we discuss it further in §5.

<sup>12</sup> Sharadin (2015) represents the right-hand side of probabilistic accounts as inequalities between a conditional probability (the probability of the relevant desire's being satisfied conditional on the relevant action's occurring) and another probability. For instance, Finlay's view (PP1 below), is stated like this:  $A$ -ing promotes  $D$  iff  $P(D|A) > P(D|\sim A)$ . But promotion is a determination relation, and inequalities don't encode determination. The “increasing probability” relation, as we're understanding it, encodes determination. That's why we opt for our way of stating probabilistic accounts.

Something can increase the probability of a proposition without making it true, and  $x$  can increase the probability of  $P$  more than  $y$  even if both  $x$  and  $y$  would increase the probability of  $P$ . Moreover, there appear to be some cases in which PP allows for promotion to rank actions on an interval scale—this is how *Lottery 1* works.

A theory of promotion may need to capture other features, but PP appears to capture the ones we've identified. This shows that the increasing probability relation appears to have the right form to account for promotion, and that given certain probability assignments, promotion and probability raising go hand in hand. Although no one has explicitly argued for PP on this basis, we suspect that something like this has motivated earlier proposals.

#### 4. The Baseline Question

PP is initially attractive. But to give it more substance, proponents of PP must answer at least two questions. First, increases the probability *relative to what*? In other words, how is the baseline probability of  $P$  fixed such that the action must raise  $P$ 's probability relative to that baseline in order to count as promoting the desire? Call this the *Baseline Question*. Second, what kind of probability is at issue? Call this the *Interpretation Question*. To assess PP, we need to know whether the probability assignments it countenances vindicate data about promotion. Different probability functions will make different probability assignments. So, in order to fix PP's content, an answer to the Interpretation Question is required.<sup>13</sup>

We devote this section to the Baseline Question. There are two kinds of answers to this question: contrastive and non-contrastive. Non-contrastive answers specify a single alternative to be used in all contexts for the purposes of probability comparison. Contrastive answers, on the other hand, abandon the goal of providing a privileged, context-independent alternative and, instead, say that whether an action increases probabilities of desires depends on a contextually specified contrast class. In turn, promotion is analyzed contrastively. Does buying one lottery ticket promote one's desire to win the lottery? It depends on the contrast. Relative to *buying no tickets* it does, because the probability of winning is greater given that you buy one ticket rather than no tickets; relative to *buying two tickets* it does not, because the probability of winning is lower given that you buy one ticket rather than two. Justin Snedegar

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<sup>13</sup> As far as we know, of the proponents of probabilistic accounts, only Finlay (2014) has addressed the Interpretation Question.

(2014) defends a contrastive account of promotion, leaving open whether promotion should be understood probabilistically. All other accounts of promotion on offer are non-contrastive. In this paper, we will restrict our attention to non-contrastive probabilistic accounts.

Two comments about contrastive probabilistic accounts are in order, though. First, one advantage of contrastive accounts is precisely that they avoid the need to select a privileged alternative in answering the Baseline Question.<sup>14</sup> They gain this advantage by abandoning both non-contrastive interpretations of the judgments that promotion occurs in examples like those in §2 and non-contrastive (desire-based) reasons. Some will likely view this as a cost, but we are uncertain about whether it is. In any case, the problems we outline for non-contrastive accounts might be taken to motivate a contrastive account, and we have no objection to viewing the upshot of our arguments in this way. This is partly because, and this is the second comment, contrastive *probabilistic* accounts must answer the Interpretation Question. This is a serious challenge, as we argue in §5, and it is not mitigated by appealing to contrastivism.<sup>15</sup>

In this section, we consider three versions of PP, each of which provides a different answer to the Baseline Question. We argue that all of these answers are unsatisfactory. In the next section, we further explain the challenge that the Interpretation Question poses.

#### *4.1 Old Views, Old Problems*

In this subsection, we review Behrends and DiPaolo's criticisms of the probabilistic accounts inspired by Finlay's and Schroeder's work.

Consider the first version of PP:

**PP1:** *S's Aing* promotes *P* iff *S's Aing* increases the probability of *P* relative to what it would have been had *S* not done *A*.<sup>16</sup>

Why does Beth's applying promote her desire to attend an Ivy League? PP1 answers: given that she applies, the probability that she attends an Ivy League is higher than it would have been had she not applied.

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<sup>14</sup> Christopher Hitchcock (2004: 405) notes that his contrastive probabilistic account of causation enjoys this sort of advantage, but the point carries over to promotion.

<sup>15</sup> Thanks to an anonymous referee for urging us to say more than we previously did about contrastive accounts.

<sup>16</sup> Finlay's (2006) suggests this view.



This is a plausible approach, but it doesn't cover all cases. Suppose that we add the following detail to *Breakfast*: had Al not made pancakes, he would have made eggs. Making pancakes promotes Al's desire to eat breakfast, but doing this may not make it any more likely that he eats breakfast than making eggs would. It follows from PP1 that making pancakes doesn't promote Al's desire. Or, consider the following case:

*Buttons*: Debbie has some desire. There are three buttons in front of her. If she pushes either Button A or Button B, her desire is guaranteed to be fulfilled. If she pushes Button C, her desire will not be fulfilled. Debbie in fact pushes A. Had she not pushed A, though, she would have pushed B instead.<sup>17</sup>

If PP1 is true, then pushing Button A does not promote Debbie's desire because, had she not pushed A, she would have pushed B, and the probability of the object of Debbie's desire is the same whether she pushes A or B. But this is the wrong result. Pushing A guarantees that her desire is satisfied. PP1 violates SATISFACTION ENTAILS PROMOTION.

PP1 also has implausible consequences regarding reasons. In conjunction with PP1, INSTRUMENTAL REASONS entails that Debbie does not have a reason to push A. But this is false: she has more reason to push A than to push C, so she has *some* reason to push A.

Rather than comparing the probability to what it would have been had the agent not done the relevant action, the next version of PP compares it to what it would have been had the agent done nothing:

**PP2**: *S's Aing* promotes *P* iff *S's Aing* increases the probability of *P* relative to what it would have been had *S* done nothing.<sup>18</sup>

PP2 gets the right results in *College*, *Breakfast*, and *Buttons*. In each case, a desire is promoted because the probability of its object is higher given that the agent does what he/she does than it would have been had the agent done nothing.

Nevertheless, the following case shows that PP2 is unsatisfactory:

*Buttons 2*: Julie has some desire. There is one button in front of her. She knows that if she pushes the button, her desire is guaranteed to be fulfilled. However, unbeknownst to her, if she does not push the button, the all powerful, mad scientist Black will ensure that her desire is fulfilled.

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<sup>17</sup> Behrends and DiPaolo (2011: 2). *Buttons 2* and *Do Nothing* below also come from this paper.

<sup>18</sup> This is suggested by Schroeder's (2007).

By pushing the button, Julie will guarantee the satisfaction of her desire, so pushing it will promote her desire. But the probability of her desire's object is the same whether or not she pushes the button. PP2 gets the wrong result because it entails that pushing the button does not promote her desire.

One might worry that Julie's pushing the button in *Buttons 2* isn't an instance of promotion, since it doesn't affect the probability of her desire. The next case avoids this worry while uncovering a further problem.

*Do Nothing*: At  $t_1$ , Austin forms the desire that  $P$  be the case at  $t_3$ . Black has arranged things such that if Austin does nothing at  $t_2$ ,  $P$  will be the case at  $t_3$ ; Black has further arranged things such that any other behavior at  $t_2$  on Austin's part will result in  $P$  not being the case at  $t_3$ .

Unlike Julie's case,  $P$ 's probability depends on what Austin does. If Austin does nothing, the probability of  $P$  is higher than it would have been otherwise. Yet, according to PP2, doing nothing does not promote Austin's desire because, obviously, the probability of  $P$  given that he does nothing is not higher than the probability of  $P$  given that he does nothing. But, intuitively, Austin does promote his desire by doing nothing.<sup>19</sup> Moreover, he has an instrumental reason to do nothing, yet, given INSTRUMENTAL REASONS, PP2 implies that an agent could never have an instrumental reason to do nothing. For these reasons, PP2 fails.<sup>20</sup>

#### 4.2 Diagnosing the Failure of PP1 and PP2

It would be useful to know what explains the failure of PP1 and PP2. One hypothesis, suggested by Behrens and DiPaolo, is that they fail because they are probabilistic accounts. Call this the *Probabilistic Hypothesis*. *Buttons*, *Buttons 2*, and *Do Nothing* all involve agents promoting their desires without increasing the probability of those desires relative to the proposed baselines. These examples may therefore suggest that promotion does not require increasing the probability of desires. And, without this requirement, probabilistic accounts may be wrong-headed.

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<sup>19</sup> An anonymous reviewer has suggested that this intuition may be more strongly elicited if we stipulate that Austin is aware of Black's arrangements. We invite you to adopt this stipulation if you find that it indeed makes the case more compelling.

<sup>20</sup> Daan Evers (2009) also emphasizes that doing nothing can sometimes promote a desire.

D. Justin Coates rejects the Probabilistic Hypothesis.<sup>21</sup> Not only are PP1 and PP2 both probabilistic accounts; they also both appeal to what happens in counterfactual scenarios to answer the Baseline Question. This latter feature renders them susceptible to the above counterexamples. Thus, Coates suggests that PP1 and PP2 fail because they are “alternate-sequence” analyses, whereas promotion requires an “actual-sequence” analysis.<sup>22</sup> Call this the *Alternative-Sequence Hypothesis*.

The Probabilistic Hypothesis and the Alternative-Sequence Hypothesis suggest different recommendations about how to analyze promotion. The former recommends a non-probabilistic account, while the latter instead recommends a probabilistic, actual-sequence account. What makes an account actual-sequence versus alternative-sequence is, however, a vexed question.<sup>23</sup> On one good sense of these terms, it’s not obvious that PP1 and PP2 aren’t actual-sequence accounts after all.

The Alternative-Sequence Hypothesis exploits a parallel between moral responsibility and promotion. On actual-sequence views of moral responsibility, an agent’s responsibility for something is a function of the actual causal sequence.<sup>24</sup> This, however, doesn’t entail that counterfactual scenarios (i.e., alternative sequences) are irrelevant to moral responsibility. For these scenarios may determine *what the actual causal sequence is*.

We can see this by focusing directly on causation rather than moral responsibility.<sup>25</sup> Imagine that each morning Jimmy flips a coin to decide whether to wear his hat that day (if it comes up heads, he wears it; tails, he doesn’t). Suzy decides that if Jimmy wears the hat, she will throw a rock at a window. Suppose that in the actual world the coin comes up heads, Jimmy wears his hat, Suzy throws her rock, and the window shatters as a result. Was Jimmy’s wearing his hat a cause of the window’s shattering? It depends. Distinguish two versions of the case:

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<sup>21</sup> See Coates (2014: 4). For different reasons, Sharadin (2015) reaches a related conclusion. He agrees that probability raising is unnecessary for promotion, but thinks it is nonetheless still sufficient. See [redacted] for criticism of Sharadin’s arguments.

<sup>22</sup> Coates (2014: 4).

<sup>23</sup> We’re inspired by Sartorio (2011) here.

<sup>24</sup> See Sartorio (2011) for a careful discussion concerning what makes for an actual-sequence view, and Fischer (2006) for a well-known defense of such a view.

<sup>25</sup> Thanks to an anonymous referee for suggesting that we focus directly on causation.

*Billy*: Suzy will throw her rock if and only if Jimmy wears his hat. But Billy knows this, and he will throw his rock (and cause the window to shatter) if and only if Jimmy doesn't wear his hat.

*No Billy*: Suzy will throw her rock if and only if Jimmy wears his hat. If Jimmy doesn't wear his hat, then no one will throw a rock.<sup>26</sup>

In *Billy*, arguably, Jimmy's wearing his hat was not a cause of the window's shattering because it made no difference to the window's shattering. However, in *No Billy*, Jimmy's wearing his hat *does* seem to be a cause of the window's shattering precisely because it did make a difference. But the events that take place *in the actual world* do not differ between these cases: Jimmy wears his hat, Suzy throws her rock, and the window shatters. What differs is which events take place in the relevant counterfactual scenarios. Thus, whether certain events in the actual world count as causes can depend on which events take place in counterfactual scenarios. Counterfactual scenarios can, therefore, determine what the actual causal sequence is.

When determining whether an action promotes a desire, defenders of probabilistic accounts ask whether that action increases the probability of that desire. If one prefers an actual-sequence version of a probabilistic account, one should ask whether the action increases the probability of the desire *in the actual sequence of events*, just as a defender of an actual-sequence view of responsibility should ask whether an action causally contributed to an outcome *in the actual sequence of events*. But, just as counterfactual scenarios can partly determine whether some action is a causal contributor in the actual sequence, so too can counterfactual scenarios partly determine whether an action is a probability-raiser in the actual sequence. And, indeed, this is exactly the role alternative sequences play for PP1 and PP2: they determine whether performing an action *actually* increases the probability of the relevant desire. Thus, even if promotion depends only on the actual probabilistic sequence, counterfactual scenarios can partially account for whether an action promotes a desire because, by setting a baseline, they can determine whether the actual sequence included an increase in the probability of that desire's object.

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<sup>26</sup> This example is adapted from Sartorio (2013); the lesson we draw here is inspired by lessons drawn in Sartorio (2011).

Emphasizing that PP1 and PP2 are plausibly thought of as actual-sequence views clarifies what is essential to Coates' diagnosis of their shortcomings, and what is not, and also clarifies what kinds of possible improvements to a probabilistic account may help, and which will not. Understood as the Alternative-Sequence Hypothesis, Coates' diagnosis fails, and this reveals that *merely* offering an actual-sequence account of PP will not improve upon PP1 and PP2, since they are themselves actual-sequence accounts.

Nevertheless, Coates *is* offering an interesting diagnosis of the failure of PP1 and PP2. But this diagnosis does not depend on the distinction between actual-sequence and alternative-sequence accounts. Rather, it depends on how the Baseline Question is answered. The idea is that PP1 and PP2 fail because they appeal to probabilities across *worlds*, rather than to probabilities across *times* in the actual world. Call this the *Across Worlds Hypothesis*. Whereas the Probabilistic Hypothesis recommends a non-probabilistic account of promotion, and whereas the Alternative-Sequence Hypothesis recommends a probabilistic, but actual-sequence account of promotion, the Across Worlds Hypothesis suggests that both recommendations are mistaken. It recommends continuing to develop PP, ignoring the distinction between actual- and alternative-sequence accounts, and finding an answer to the Baseline Question that compares probabilities only across time.

In the next subsection, we introduce Coates' preferred version of PP, and argue that it fails *precisely because* it follows the recommendation of the Across Worlds Hypothesis.

#### 4.3 *New View, New Problems*

Coates endorses the following version of PP, the final version that we consider:

**PP3:** *S's Aing* promotes *P* iff *S's Aing* increases the probability of *P* relative to the antecedent intrinsic likelihood of *P*.

Promotion occurs, according to PP3, just in case the probability of the agent's desire, as a result of his performing the relevant action, is higher after the action occurs than its "antecedent intrinsic likelihood."<sup>27</sup> To illustrate, Coates suggests the following case. Consider Harold's desire to finish his book manuscript. Coates says that if Harold works on his manuscript for at least eight hours a day, then he promotes his desire. Coates argues that PP3 explains this: "the antecedent intrinsic likelihood of [Harold's] manuscript being

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<sup>27</sup> We say more about Coates' appeal to "intrinsic" probabilities below.

finished without at least eight hours per day of work is much lower than is the likelihood of [his] manuscript being finished with at least eight hours per day of work.”<sup>28</sup>

According to Coates, PP3 is immune to the criticisms against PP1 and PP2. Consider *Buttons*. Since it is possible that Debbie will push C, the antecedent intrinsic probability (AIP, hereafter) of her desire’s object is less than 1 before she pushes A. When she pushes A, the probability of Debbie’s desire is raised from its AIP – some probability less than 1 – to 1. So, pushing A promotes her desire, according to PP3. Moreover, since PP3 gets the right result about promotion, it allows the right result concerning instrumental reasons.

Now consider *Buttons 2*. PP2 delivers the wrong result, Coates contends, because it allows “*counterfactual* promoters” to make a difference.<sup>29</sup> But PP3 focuses on *intrinsic* probabilities that don’t depend on extrinsic features of the actual sequence, like Black’s presence. So, as long as the AIP of Julie’s desire is less than 1 before she pushes the button, pushing it will increase her desire’s probability and, hence, according to PP3, promote her desire. And even though she knows that *if* she presses the button, her desire will be satisfied, it does not follow that her desire will be satisfied because that fact does not entail that she will press the button. So, the AIP of her desire is less than 1.<sup>30</sup>

PP3, then, appears to have some advantages over its probabilistic competitors. But fully evaluating it requires a firm understanding of the kind of probabilities to which it appeals – AIPs. And such an understanding, we think, is harder to come by than it might initially seem. So, in what follows, we will explain why we think this, and propose a new model for evaluating answers to the Baseline Question. Then we will apply that model to PP3, and argue that PP3 is extensionally inadequate.

Coates begins with his book manuscript case as an illustrative example of how PP3 is meant to work, but we don’t find it helpful in that regard. He assumes that Harold’s working on his manuscript more than eight hours a day increases the probability that he finishes compared to working on it less. But suppose that after six hours of work, Harold begins making so many mistakes that he has to spend the next six hours fixing those mistakes. On Monday, he works from 8AM to 4PM, and at 2PM fatigue sets in and he begins making a

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<sup>28</sup> Coates (2014: 5). Coates presents the case in the first person, but, to avoid confusion about whether we are referring to the author or to the subject in the example, we have chosen to refer to the subject as ‘Harold.’

<sup>29</sup> Coates (2014: 6).

<sup>30</sup> Coates doesn’t explicitly address *Do Nothing*, but it should be clear how PP3 applies to that case.

ton of mistakes. On Tuesday, he spends the first six hours correcting those mistakes, and at 2PM fatigue sets in and he begins making a ton of mistakes. At this rate, he'll never complete his manuscript. In this case, working fewer hours (under six) would increase the probability that he finishes his manuscript.

Of course, Coates is free to stipulate whatever details he'd like. But one purpose of the example was to illustrate the concept of AIP, and it's not clear from this example why the probabilities are as he assumes them to be rather than how they are in our alternative version. Evaluating the extensional adequacy of answers to the Baseline Question requires having, in a given case, an independent grasp on both whether it's a case of promotion and what the probability distribution is like. Whether or not we have an independent grasp on promotion in the manuscript case, we don't have an independent grasp on the probabilities.

We suggest using a lottery framework to assess answers to the Baseline Question. In this framework, we assign the proposition that the agent wins the lottery as the object of the agent's desire. Then we model the agent's options in terms of buying tickets, selling tickets, or refraining from either transaction. Buying more tickets increases the probability of winning, i.e., increases the probability of the object of the agent's desire; selling tickets reduces that probability, etc. For simplicity, we will focus on ten-ticket lotteries.<sup>31</sup>

To illustrate how this framework operates, consider *College*. Beth's options include applying or not applying at  $t_1$ . Suppose that everyone who applies has some chance of getting in, but acceptance requires applying. In the framework, at  $t_1$ , Beth has no tickets, so her options consist of buying a ticket or not buying a ticket. If she doesn't buy a ticket, the chance of winning is 0; if she buys a ticket, her chances increase. To get more fine-grained, suppose that if she applies, she can write an excellent entrance essay or a poor one. These options can be understood in terms of buying more or fewer tickets. Once we set the details, then we can ask about promotion. Suppose that at  $t_2$  she buys 1 ticket. Did this promote her

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<sup>31</sup> In discussing lottery cases to assess answers to the Baseline Question, we will bracket concerns about answering the Interpretation Question (which we discuss in §5). When using the lottery framework to test answers to the Baseline Question, what we are really asking is this: *assuming that there is a good answer to the Interpretation Question, such that the relevant probabilities are as stipulated in the lottery cases, does the candidate answer to the Baseline Question get the right result?* Of course, if there is no good answer to the Interpretation Question, then probabilistic accounts face a serious problem. But here the point is that there are *independent* problems with answering the Baseline Question.

desire to win? Intuitively, yes. Buying a ticket to a fair lottery when you have no tickets both increases your chances of winning and, perhaps plausibly, promotes your desire to win.<sup>32</sup>

Now consider *Itch*. Itches can go away on their own, so Cate's options differ from Beth's. The chance that her itch goes away, suppose, is greater than 0. But by scratching it, she brings that probability up to 1. In the framework, Cate begins with at least 1 ticket, and the remaining tickets are all still available. So, she buys the rest of them. By purchasing all of the tickets, she satisfies her desire to win. And, again, purchasing the remaining tickets intuitively promotes her desire.

What about *Buttons*? Debbie has *two* options available to her that would guarantee that her desire is satisfied. We can model different options that have the same outcome by distinguishing between transaction sequences that have identical results. One way to guarantee a win is to buy all of the tickets. Another is to buy them all, sell one, but then buy it back immediately.

This framework may have limitations, but it is appealing because it allows us to evaluate the extensional adequacy of answers to the Baseline Question while leaving unnecessary details of cases behind. Furthermore, it nicely models the sort of probability relevant to PP3.

Return now to PP3. Coates provides a second, more illuminating example to help us understand AIPs:

Moreover, *intrinsic* probabilities of the sort that are relevant to [PP3] do not depend on extrinsic features of the actual sequence (like the presence of Black). To see this, consider a fair six-sided die that is rolled. Making some standard assumptions, the antecedent intrinsic probability that a 3 will come up is roughly .166. But this is true even if God always miraculously kept the die rolling until it came up 3 (such that 1, 2, 4, 5, or 6 was never rolled). No doubt, God's presence guarantees that the die will come up 3, such that if we rolled it *n* times, it would come up 3 *n* times. But again, this does not entail that the antecedent intrinsic probability of the die coming up 3 is 1, since the intrinsic probability of some outcome is presumably determined by the

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<sup>32</sup> Why the caution about whether promotion occurs in this case? We sometimes wonder whether promotion can occur only if the relevant desire is eventually satisfied. We will not explore this thought further here. Note, though, that it does not conflict, as one might worry it does, with PROMOTION DOES NOT ENTAIL SATISFACTION.



intrinsic properties of the event itself, and God's miraculous involvement in the outcome is not an antecedent intrinsic property of rolling a die.<sup>33</sup>

In terms familiar from discussions of probability, AIP resembles propensity rather than frequency.<sup>34</sup> Many questions about AIPs remain, but this passage gives us enough to show that PP3 is incorrect.

Consider the following case:

*Lottery 2:* Olivia desires to win the lottery she has entered, in which one of ten tickets will win. Without external interference, the lottery is fair, with the winning ticket being determined by random selection. However, Black arranges things so that if Olivia does not purchase any additional tickets, her ticket is guaranteed to win (because he'll make the otherwise random selection process non-random in some way). If Olivia does purchase additional tickets, though, Black will not intervene, and the lottery will proceed without interference. Regardless of whether she purchases additional tickets, Olivia will retain at least her first.

Given Coates' discussion of the die case, it should be clear that, on his account, the AIP of Olivia's winning the lottery after she purchases one ticket is .1. This is so despite Black's presence, for the same reason that the AIP of the die landing 3 is approximately .166 despite God's presence: Black's involvement with the lottery is not an antecedent intrinsic property of selecting a winning lottery ticket.

But once we are forced to accept that the AIP of Olivia's winning after purchasing one ticket is .1, PP3 yields at least one objectionable result: that purchasing a second lottery ticket promotes Olivia's desire to win the lottery. This is because purchasing the second ticket increases the probability that she wins from the AIP of .1 to .2; remember, if she purchases an additional ticket, the lottery will proceed without Black's involvement. So, according to PP3, Olivia promotes her desire by moving from a position in which her desire is guaranteed to be fulfilled – which is true, due to Black's potential involvement, even though the *antecedent intrinsic probability* is only .1 – to one in which the probability that her desire is fulfilled is .2. Surely no plausible account of promotion implies that one promotes one's desire by deviating from a course of action that would otherwise fulfill that desire in

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<sup>33</sup> Coates (2014: 6-7).

<sup>34</sup> Hajek (2011).

favor of one that is very unlikely to fulfill it. Indeed, if Olivia purchases the second ticket and then *loses* the lottery, as is very likely in that scenario, PP3 still entails that the second purchase promoted her desire to win, even though purchasing the second ticket *led to her desire being frustrated*.<sup>35, 36</sup>

The foregoing is meant to show that making *P* more likely relative to the AIP of *P* is not sufficient for promoting *P*. Although counterfactual interveners are, we're supposing, irrelevant to AIPs, they are not irrelevant to promotion and to reasons related to promotion, as *Lottery 2* demonstrates. To make the point about reasons explicit, consider whether Olivia has a *reason* to purchase the second ticket that is grounded in her desire to win the lottery. We maintain that she does not. Her desire-based reasons count in favor of standing pat, and count against a second purchase, as making the second purchase would very likely frustrate her desire. So, again, *Lottery 2* shows both that PP3 has counterintuitive results when considered solely as an account of promotion, and that it has a further counterintuitive result when combined with theses like REASONS or INSTRUMENTAL REASONS.

This example shows that probability raising of a certain sort is not *sufficient* for promotion. This is noteworthy because, compared to PP1 and PP2, PP3 is meant to provide a more restrictive answer to the Baseline Question. Probability raising of the sorts appealed to in PP1 and PP2 are not *necessary* for promotion. According to Coates, PP1 and PP2 allow for factors too extrinsic to play a role in determining the baseline. Following the recommendation of the Across Worlds Hypothesis, PP3 eliminates the influence of counterfactual scenarios on promotion. But, as we've shown, eliminating any role for such extrinsic factors leads to the wrong results.

Going forward, when answering the Baseline Question, defenders of PP need to thread the needle delicately, by developing a view that is sensitive to counterfactual scenarios (to avoid the problems with PP3), but that is not *too* sensitive to counterfactual scenarios (to avoid the problems with PP1 and PP2). Nothing we have said shows that this task is impossible. We hope to have shown, however, that it will be a challenge.

## **5. Probabilistic Promotion and the Interpretation Question**

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<sup>35</sup> Sharadin (2015) argues that probability-raising suffices for promotion. Depending on how he understands the probabilities, this may also constitute an argument against his view.

<sup>36</sup> As with *Do Nothing*, if you find the case more compelling by imagining that Olivia is aware of Black's involvement, we invite you to do so.

Let's summarize. Probabilistic accounts capture many of the data a theory of promotion should capture. All probabilistic accounts must answer the Baseline Question: actions promote desires just in case they increase the probability of those desires *relative to what?* PP1 and PP2 answer by setting the baseline in terms of what happens in counterfactual scenarios. But promotion does not require increasing probability relative to these baselines. PP3 sets the baseline only in terms of what happens in the actual world. But increasing probability relative to this baseline does not suffice for promotion. So far there is no defensible (non-contrastive) version of PP, because no defensible answer to the Baseline Question has been offered.

Probabilistic theories must *also* answer the Interpretation Question: what kind of probability is at issue in PP? To begin to see the import of the Interpretation Question, consider the following examples, which represent different attempts at answering it. We will stipulate that each of the examples' characters believe (i) that some actions that occur in the actual world promote some desires, and (ii) that PP is true.

Otto is a physicist who endorses PP. Aware of the Interpretation Question, Otto believes that the relevant probability is *objective chance*. His work in physics has convinced him that the world is fundamentally deterministic; evidence to the contrary is simply misleading, he contends. Moreover, he rejects *compatibilism* about chance and determinism, the position that chance is compatible with determinism.<sup>37</sup> It follows from these commitments (i) that some actions increase the objective chances of some desires and (ii) that no actions increase the objective chances of some desires.<sup>38</sup> Otto's commitments are inconsistent.

Sarah endorses a different answer to the Interpretation Question. She believes that PP should be understood in terms of subjective credence. Accordingly, she thinks that whether an act promotes a desire is agent-relative. For on one agent's subjective credence function an act may increase the probability of the desire (i.e., the agent assigns higher

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<sup>37</sup> Incompatibilists, like Popper (1982), Lewis (1986), and Schaffer (2007), argue that no deterministic worlds are chancy. Compatibilists, like Loewer (2001, 2004) and Hoefer (2007), argue for the negation of that claim.

<sup>38</sup> PP, and the positions that promotion actually occurs and that the relevant probability is objective chance, together entail that some actions increase the objective chances of some desires. The position that determinism is actually true, together with incompatibilism about chance, entail that objective chances of propositions in the actual world always have a chance of either 0 or 1, which further entails that there can be no actions that increase the objective chances of desires.

credence to the desire conditional on the act compared to the unconditional credence she assigns to the desire), while on another agent's credence function, the opposite is true.

Finally, Ida agrees with Otto that the probabilities relevant to PP are objective, but she sees that his commitments are inconsistent. Instead, she relies on a more intuitive way of assigning probabilities, namely the principle of indifference. When confronted with a set of mutually exclusive and jointly exhaustive propositions, she assigns them equal probabilities that sum to 1. For instance, she knows that there are ten tickets in the lottery she's considering entering, exactly one of which is a winner. Considering the propositions *Ticket 1 will win*, *Ticket 2 will win*, ... *Ticket 10 will win*, she assigns each a .1 chance. She reasons that, since she wants to win, and she has no tickets, buying one ticket would promote her desire because it would increase her chance of winning.

In light of these examples, we can elaborate on the Interpretation Question. There are many different probability functions, with many different features. One function may assign a proposition a very high value, while another assigns the same proposition a low value. Which function is the one that should be associated with PP? There are three kinds of probability available to defenders of PP: objective chance, subjective credence, and what might be called *evidential probability*. Proponents of PP who think agents actually have reasons, and who think promotion is linked to reasons as suggested in §2, take on commitments about the actual distribution of probabilities. Even if a proponent of PP doesn't believe promotion is linked to reasons, so long as she thinks promotion actually occurs, she still takes on commitments about the actual distribution of probabilities. This commitment needs to be explained and defended because not just any view on the matter is acceptable.

Sarah's view – the subjective credence view – seems implausible given the data in §2. The relevant probabilities seem to be objective, in the sense that their existence and values are independent of our beliefs, rather than, for example, subjective probabilities that express the probability of an outcome relative to some body of evidence. That is because the promotion relation is supposed to capture an objective feature of the world. There are two related reasons for this. First, recall that promotion is a determination relation akin to causation. Actions promote desires, according to PP, by causing the probability of those desires to increase. It follows that if PP is true and promotion occurs, actions causally influence the probabilities. The probabilities relevant to PP are, to use Barry Loewer's

phrase, “involved in the causal nexus.”<sup>39</sup> Just as causal relations needn’t depend on beliefs, the probabilities determining promotion needn’t either. Second, consider promotion’s relationship to principles like REASONS and INSTRUMENTAL REASONS. The reasons being analyzed in terms of promotion in these principles are themselves objective reasons – they are reasons that *in fact* count in favor of some action, or that indicate some action is *in fact* instrumental to some end, independent of whether any agent believes, or has any way of knowing, that they are.<sup>40</sup> In this sense, agents can have instrumental reasons to perform actions when they are very confident that these actions will *not* further their aims, and can also fail to have instrumental reasons to perform actions when they are very confident that these actions *will* further their aims.

Even if we agree that the relevant probabilities are objective, an acceptable answer to the Interpretation Question must say more.<sup>41</sup> Given PP, different objective probability functions have different implications concerning promotion. Consider the determinism issue. Even if Otto is wrong, and compatibilism is true, it doesn’t follow that all deterministic worlds are chancy. Indeed, it may turn out that the actual world is a non-chancy deterministic world (i.e., every proposition is assigned a value of 0 or 1, and it has that value throughout history). Suppose Otto is correct that the relevant probabilities are objective chances, and that the actual world is non-chancy. If promotion requires an increase in probability across times, then there is no promotion in the actual world. Moreover, if promotion is linked to reasons in the ways suggested in §2, then agents have no desire-based reasons in the actual world. But this is implausible. When Cate scratches her head, she satisfies, hence promotes, her desire. These facts provide a reason for her to scratch her head, even if the chance of her desire’s being satisfied was always 1.<sup>42</sup> And, of course, the point here doesn’t depend on the *actual* world being the non-chancy deterministic world.

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<sup>39</sup> Loewer (2004: 1116).

<sup>40</sup> Schroeder (2007: 15), for example, is explicit that this is the kind of reason with which he is concerned.

<sup>41</sup> Finlay (2014: 42) also suggests that objective probabilities, rather than subjective, are relevant to promotion. As we noted in fn. 14, Finlay is the only author of whom we are aware who directly addresses the Interpretation Question.

<sup>42</sup> If you agree that there is promotion in this case and you agree that there is no (relevant) probability raising, then this is another reason to think that probability raising is unnecessary for promotion.

Thus, whether “objective chance” is an acceptable answer to the Interpretation Question depends on the relationship between chance and determinism.

Ida’s view – the evidential probability view – is likely the most attractive to proponents of PP. The probabilities are objective, but they allow for non-extreme values (i.e., between 0 and 1). This is important because in a case of promotion without satisfaction, PP implies that the relevant action increases the probability of the relevant desire’s object above the baseline, but leaves it below 1. However, to settle on one probability assignment over its alternatives, Ida appeals to the principle of indifference (POI). This is problematic because the POI leads to either arbitrary or contradictory results. If presented with two mutually exclusive and jointly exhaustive hypotheses about which you are completely ignorant, H1 and H2, the POI tells you to assign them equal probability  $P(H1)=P(H2)=1/2$ . Likewise, if presented with three such hypotheses, H1’, H2’, and H3, it tells you to assign them equal probability  $P(H1’)=P(H2’)=P(H3)=1/3$ . The problem is that H1 may be logically equivalent to H1’, and H2 may be logically equivalent to H2’&H3. For instance, the hypotheses might be that the General Theory of Relativity (GTR) is true, and that GTR is false. If you are completely ignorant about which of these hypotheses is true, the POI requires that you assign a probability of 1/2 to each. But the hypotheses might be that GTR is true, that Newtonian Theory is true, or that some other theory is true. Given these options, the POI requires that you assign a probability of 1/3 to each. Likewise, Ida may be presented with the ten-ticket scenario. In this case the principle tells her to assign each hypothesis 1/10. Alternatively, she may be presented with the two hypotheses that Ticket 1 wins and Ticket 1 does not win. If this is all she knows, then the POI tells her to assign each hypothesis 1/2. But, given the logical relationships among the hypotheses in these cases, the POI faces a dilemma. If it requires that she make both assignments, then it’s contradictory; if it privileges one assignment over the other, it’s arbitrary. Many see this approach as hopeless.<sup>43</sup>

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<sup>43</sup> See Sober (2008: 27-28) for a brief, non-technical discussion of problems associated with the POI. For a recent defense of the POI, see White (2012). For critical discussion of White’s arguments, see Meacham (2014). In fn. 41, we observe that Finlay suggests that promotion should be understood in terms of objective chances. In analyzing the *good for* relation, Finlay (2104: 44) relies on the POI. It seems to us that such an analysis will suffer from the problems we discuss above.

These three approaches are not the only possible approaches to answering the Interpretation Question.<sup>44</sup> So, even if each of those approaches is unsatisfactory, it doesn't follow that no possible answer to the Interpretation Question is satisfactory. Perhaps some more sophisticated subjective account could do the trick, or perhaps principled reasons for preferring a particular objective probability function are in the offing. Without at least gesturing toward some such account and thereby confronting the Interpretation Question, proponents of PP will have left their view uninterpreted.

## 6. Conclusion

In order to provide an adequate account of promotion, proponents of PP must provide an answer to the Baseline Question that renders their position extensionally adequate.

Defenders of PP also owe us an answer to the Interpretation Question. The stakes are high in answering the latter question. If it turned out that the only suitable understanding of objective probabilities, when conjoined with PP, entails that there are no instrumental reasons in deterministic worlds, then that would be a good reason to reject PP. And our appeal to the relationship between probability and determinism is meant to stand only as an illustrative example; further complications may arise, depending on how defenders of PP attempt to answer the Interpretation Question. Of course, we're not requesting that defenders of PP provide *particular* probability assignments of actual events. Instead, we're asking for a theory that explains the source of the probability assignments such that promotion is compatible with determinism, or such that all of the relevant events have the probability assignments that correspond to our intuitions about promotion. We have canvassed some of the potential first steps proponents of PP might be inclined to make and suggested that they will need quite a bit of defense.

On the basis of the foregoing arguments, we are pessimistic about the prospects for probabilistic accounts of promotion. No defensible non-contrastive answer to the Baseline

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<sup>44</sup> Arguably, there are only three kinds of probability to choose from in answering the Interpretation Question (objective chance, subjective credence, and evidential probability), and Otto, Sarah, and Ida each adopts one of these. But they also adopt auxiliary assumptions – for instance, that chance is incompatible with determinism – which are plausible, given their choice of probability, but not mandatory. Different packages of (i) a kind of probability and (ii) auxiliary assumptions will constitute different approaches to answering the Interpretation Question. So, proponents of PP need to either defend the results we consider problematic or defend different packages.

Question has been proposed. Further, providing a satisfactory answer to the Interpretation Question appears to be a daunting task, the difficulty of which seems not to be fully appreciated by most proponents of PP.

Of course, there may not be viable alternatives to probabilistic accounts. If these accounts are the only game in town, then we must either accept them, or conclude that our concept of promotion does not attach to any relation that actually obtains. We are optimistic that a non-probabilistic account of promotion can be developed, but we reserve that work for another time.

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