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Probabilistic Antecedents and Conditional Attitudes

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Abstract

I generalize the notion of a conditional attitude by bringing together two topics of inquiry. One is the ordinary inquiry into conditional attitudes. The other topic is the inquiry into the attitude of thinking that a proposition is likely, or having a high credence in a proposition. For instance, what is it to intend to go to the game if it is likely that Kershaw pitches? Being likely that Kershaw pitches is the condition of the attitude. Given a natural position about statements like “It is likely that Kershaw pitches,” the target attitude looks different from ordinary conditional attitudes.

Keywords: Conditional attitudes; credences; nonfactualism; attitude ascriptions; information-sensitivity

1. Introduction

In this paper, I generalize the notion of a conditional attitude by bringing together two topics of inquiry. One is the ordinary inquiry into conditional attitudes—like an intention to go to the game if my favorite team is in town. The other topic is the inquiry into the attitude of thinking that a proposition is likely—or having a high credence in a proposition. There has been discussion of what it is, for instance, to think it is likely that the Nationals will win if Scherzer pitches, where theorists investigate the conditional version of a credence. However, there is another way that these topics can intersect. We might, instead, be interested in what it is to, say, intend to go to the game if it is likely that Kershaw pitches. Here, it being likely that Kershaw pitches is the condition of the attitude. Given a natural position about statements like “It is likely that Kershaw pitches,” the attitude ascribed looks different from ordinary conditional attitudes. Reflecting on this will provide us with a more general picture of conditional attitudes.

In section 2, I present two central principles of the standard picture of conditional attitudes. In sections 3 and 4, I develop theses about how we ascribe conditional attitudes and credences. In section 5, I show how the common way these theses combine yields a natural view of how we ascribe conditional credences—a popular object of philosophical theorizing. In section 6, I show how another way the theses combine motivates a kind of conditional attitude that is inconsistent with our starting principles. In section 7, I sketch a more complete picture of conditional attitudes.

2. Two theses about conditional attitudes

Josephine is considering whether to go to the game tonight. She knows that her favorite team is playing in her city sometime this week, but she can't remember if it is tonight. Before she can check the schedule, a friend asks if she is going to the game. Josephine explains that she intends to go to the game if her favorite team is in town.

Josephine's attitude is a *conditional intention*. It is clearly not an unconditional or simple intention to go to the game. It is less obvious, but still plausible that Josephine's attitude is not a

simple intention *of any kind*—in particular, not a simple intention towards a conditional content. We can see this by focusing on the situations in which Josephine satisfies her conditional intention. It appears that it is satisfied in cases where her favorite team is in town and she goes to the game, it is frustrated in cases where her favorite team is in town and she doesn't go, and no question of whether it is satisfied arises in cases where her favorite team is not in town. What is true for intention is true for other sorts of attitudes. The patterns of satisfaction for conditional versions of other attitudes—desires, fears, and beliefs—are similar.¹ Even if one disputes these claims for some attitudes, they appear true for many. Regardless, I'm going to state the lesson boldly:

Satisfaction of Conditional Attitudes: One satisfies a conditional attitude if the condition and the content are true, one fails to satisfy it if the condition is true and the content false, and the issue of satisfying it doesn't arise if the condition is false.

This constrains an account of conditional attitudes.

Attempts to construe Josephine's conditional intention as a simple intention with a conditional content don't replicate this pattern of satisfaction, frustration, and the absence of both. Consider the hypothesis that her conditional intention is an intention with a material conditional content—that either she goes to the game or her favorite team is not in town. This can't be right. She has not carried out her conditional intention in circumstances where her favorite team is not in town, though she would carry out a simple intention in the material conditional in such circumstances (Edgington 2001, 409–10; 2014; McDaniel and Bradley 2008, 270–71; Ferrero 2009, 703–5; Ludwig 2015, 46; and Kleinschmidt (n.d.)). Her conditional intention also is not an intention to make the closest possible world in which her favorite team is in town one in which she goes to the game (a simple intention in a Stalnaker [1981] conditional). Again, she hasn't carried out her intention in circumstances where her favorite team is not in town—even if she does go to the game in nearby counterfactual possibilities in which her team is in town (McDaniel and Bradley 2008, 270). Similar arguments seem available for other similar accounts of conditional propositions, suggesting that her conditional intention is not a simple intention to make any sort of conditional proposition true.²

Perhaps we would make more progress by accepting a theory of conditionals which says that they don't have propositional contents and their truth does not depend on the possible world of evaluation. An alternative theory of this sort introduces a new parameter, an information state, modelled as a set of possible worlds. According to this theory, a conditional is true if and only if the consequent is true in all worlds of the information state in which the antecedent is true (Yalcin 2007, 998; Jerzak 2019, 77).³

Can we make sense of conditional attitudes as attitudes toward information-sensitive conditional contents? Let's think first about belief. Let a person's *belief state* be the set of worlds consistent with their beliefs. Yalcin's (2007, 996) account of "believes" does two things: (i) it shifts the

¹See McDaniel and Bradley (2008, 277) on conditional desires and Edgington (1995, 290) on conditional beliefs. We can extend the notion of satisfaction to desires, fears (where satisfying a fear is not a good thing), and even beliefs (a belief being *true*), but not credences. So, Satisfaction of Conditional Attitudes should, strictly speaking, only apply to those attitudes whose simple version have satisfaction conditions.

²Lennertz (n.d.) argues that considerations similar to those presented in these paragraphs justify genuinely *quantificational* attitudes in addition to genuinely conditional ones.

³This static view—where conditionals have truth-values relative to information states—is closely related to a dynamic information-sensitive view. According to it, sentences' meanings are directions for moving from one information state to another. Conditionals test whether an information state, when updated by the antecedent, accepts the consequent (whether the consequent is true in all worlds of that updated state). If the test is passed, the information state remains the same; if it is failed, the state becomes defective—is reduced to having no open possible worlds—and epistemic repair is in order (see Gillies 2004 and related discussions in Gillies 2009; 2010). Ciardelli (Forthcoming) develops an interestingly different static, information-sensitive approach to conditionals, which avoids some problems of the standard version. Nonetheless, it doesn't address the problems discussed below involving attitude verbs like "intends" or "wants."

information state for evaluation to the subject's belief state and (ii) it asks whether the complement is true evaluated relative to each world-information state pair for the worlds in that information state. This yields the traditional account for all non-information-sensitive complements. For information-sensitive conditional complements, it implies that for *S* to believe a conditional is for the consequent to be true in all worlds of *S*'s belief state in which the antecedent is true. In other words, it is for *S* to have a belief state which, when updated by the antecedent, accepts the consequent.⁴

Unfortunately, this account doesn't extend in a plausible way to nonbelieflike attitudes. Let's try something similar for intention, letting "intends" shift the information state parameter to the subject's *intention state*—the set of worlds in which their intentions are carried out—and then evaluate the complement relative to each world-information state pair for the worlds in this state. Here's an example that shows that this doesn't work. Suppose a candidate intends to win the nomination, but also conditionally intends to vote for their primary opponent if they lose the nomination. The candidate's intention state will include only worlds where they win the nomination. Since that becomes the information state relative to which the conditional is evaluated, any conditional with the antecedent "the candidate loses the nomination" is trivially true. So, though it is then true that the candidate conditionally intends to vote for their primary opponent if they lose the nomination, it is also true that they conditionally intend to vote for the other party's nominee (and to stay home, etc.) if they lose the nomination.⁵ This problem arises because shifting the information state of evaluation to the subject's intention state mixes information about the world with how they intend it to be. Insofar as we represent intention states with the same structure as we've been representing information states, we seem to encounter this problem.⁶

We might, therefore, suggest that "intends" doesn't shift the information state relative to which we evaluate its complement. Given that the information-sensitive account of conditionals says their truth depends only on the information state, this yields the problematic result that a conditional intention ascription is true in exactly those world-information state pairs in which the unembedded conditional is true. This means that every true conditional is something a subject intends and every conditional intention a subject has is satisfied. Surely, this can't be right.

There is also a more general worry, which applies regardless of our position about shifting the information state. A straightforward version of the information-sensitive theory of conditionals assigns a sentence a truth-value relative to *every* possible world-information state pair. So, an attitude with a conditional content is always satisfied or unsatisfied. There are no cases where the question of satisfaction doesn't arise—contrary to Satisfaction of Conditional Attitudes.

⁴For a formal version of this informal presentation, the reader can adapt to belief Yalcin's (2007, 995) account of "*x* supposes ϕ ."

⁵A related issue arises for desires. It can be rational to have contradictory desires, though the set of worlds in which they are satisfied is empty. And, so, we will get cases like those arising for intention for any such rational desirer regardless of what the antecedent of the desired conditional is.

⁶Ciardelli (2020) develops a more nuanced information-sensitive picture of conditionals that may be able to avoid this prediction because he gives more structure to information states. His graded information states encode spheres of plausibility among the worlds in the state. We typically assess conditionals relative to the closest sphere, but if the antecedent of a conditional eliminates all worlds in that sphere, we move to the next closest sphere. Suppose we allow intention states to have a similar structure. Then, though supposing the antecedent of the conditional (the candidate loses the nomination) eliminates all worlds in the closest sphere of his intention space, the next closest sphere includes only worlds in which he votes for his primary opponent, and none where he votes for a member of another party. So, the ascription is predicted to be true, as desired. I find Ciardelli's picture attractive. However, it is important to see that a Ciardelli-like picture of the structure of intention states couldn't be generated by a set of simple intentions. One way to determine such a structure is with simple *and* genuinely conditional intentions. For this reason, I'm not sure Ciardelli's view is an alternative to the picture I'll develop in this paper, but it is rather an interesting path for formally implementing it. Regardless, Ciardelli doesn't include a discussion of probabilistic antecedents (2020, 514), and it is beyond the scope of this paper to try to extend his picture in that direction.

We can avoid this problem by saying that conditionals are neither true nor false but *undefined* when the antecedent is impossible given the information state (Gillies 2009, 347; see also Yalcin 2007, 998). According to this view, Josephine's conditional intention is neither satisfied nor unsatisfied when the information state accepts that her favorite team is not in town. That is the kind of result we want. However, the stipulation of undefinedness, not information-sensitivity, is responsible. De Finetti and Angell (1995), Jeffrey (1963), and Belnap (1970) secure similar results by giving propositional or truth-functional trivalent semantics with an undefined truth-value.⁷ I consider this approach the most promising avenue to vindicate Satisfaction of Conditional Attitudes while maintaining that conditional attitudes are attitudes toward conditional contents. Nonetheless, there are choice-points and problems—which I don't have room to discuss here—that lead away from such a view (Egré and Cozic 2016, sec. 7; Bradley 2002, 369).

Our discussion thus far suggests that conditional attitudes are not ordinary attitudes toward conditional contents—whether those contents are world- or information-sensitive. What we've seen for intention seems true for other attitudes as well. This suggests that, for instance, Angie's desire to present an objection if she thinks of a good one is not a simple, unconditional desire toward a conditional content. Likewise, for Jimmy's thought that it is likely that a Democrat will win if the economy improves and Christopher's belief that school will be canceled if the buses can't get over the hill. A natural reaction is that a conditional attitude is a different sort of attitude than a simple one:

Two Arguments in Conditional Attitudes: Conditional attitudes have two arguments, a proposition which plays the role of the condition and a proposition which plays the role of the content.⁸

In what follows, I'll show that natural theses about ascribing conditional attitudes and uncertainty are incompatible with Two Arguments in Conditional Attitudes and Satisfaction of Conditional Attitudes. In building a satisfactory view of the structure of conditional attitudes, I will show how to amend our principles.

3. Conditional attitude ascriptions

In the previous section, I made some preliminary conclusions about the nature of attitudes based on considering Josephine's case. I did so by reflecting on her state of mind and what it would take to satisfy her attitude in the case described. However, in discussing this case, it's important to ensure that I haven't been tacitly ignoring an alternative interpretation, which might undermine the considerations in favor of Two Arguments in Conditional Attitudes and Satisfaction of Conditional Attitudes. To see the alternative that I might have missed, it helps to semantically ascend and focus on the language used to describe Josephine's case. In particular, we should consider:

- (1) Josephine intends to go to the game if her favorite team is in town.

⁷The results are not precisely the same. Ignoring the possibility that the antecedent itself might be undefined, Gillies's (2009) information-sensitive view says that the question of satisfaction doesn't arise when the information state rules out the antecedent, whereas the world-sensitive view says it doesn't arise when the antecedent is false (Jeffrey 1963; Belnap 1970).

⁸See Edgington (2001; 2014, sec.3), McDaniel and Bradley (2008), and Ferrero (2009). Two Arguments in Conditional Attitudes might seem to rule out an information-sensitive view of conditionals, which says that contents are not propositions. But according to this view, though conditionals are information-sensitive, other expressions are not. So, these expressions have contents that are equivalent to propositions. Therefore, only in cases where the antecedent or consequent is itself a conditional does Two Arguments in Conditional Attitudes cross the information-sensitive view in a substantive way. I'll avoid such complicated cases for now. Nonetheless, my problem for Two Arguments in Conditional Attitudes (section 6) arises because *likely* generates nonpropositionality in a way similar to information-sensitive conditionals. Insights of the information-sensitive picture guide a response. See Moss (2015; 2018, sec. 4.2) for a focus on conditionals with information-sensitive (conditional or probabilistic) antecedents and consequents.

What does a speaker who utters a sentence like (1) typically do?

We can see the discussion in the previous section as putting forward two possible answers to this question. First, you might think that the logical form of what a person conveys in uttering (1) is roughly the following (where *Intend* is a two-place function taking an agent and a content and yielding a content and *If* is a two-place function taking two contents and yielding a content):

(1_{sa}) Intend [Josephine, If [Josephine's favorite team is in town, Josephine goes to the game]]

Or you might think that the form is rather (where *Conditionally Intend* is a three-place function that takes an agent and two contents and yields a content):

(1_{ca}) Conditionally Intend [Josephine, Josephine's favorite team is in town, Josephine goes to the game]

In section 2, I suggested that a view like (1_{sa}) is incorrect and that we should instead accept a view like (1_{ca}). But both take (1) to be used to ascribe an attitude; they simply differ on the attitude ascribed. This ignores a third possibility—that sentences like (1) aren't used to ascribe attitudes at all. They are merely conditionals whose consequents are sentences that are typically used to ascribe attitudes. As a matter of the scope of the conditional and the attitude verb, it is possible that the form of what is typically expressed by a use of (1) is as follows:

(1_c) If [Josephine's favorite team is in town, Intend [Josephine, Josephine goes to the game]]

So, in order to be confident that something like Two Arguments in Conditional Attitudes and Satisfaction of Conditional Attitudes are correct, I must explicitly discuss the plausibility of a (1_c)-style reading of (1).

I'll discuss few authors as foils, though they merely suggest that some uses of sentences like (1) convey contents the form (1_c) (indeed, the surface forms of almost all of the examples they discuss *begin* with the "if"-clause, which might privilege such a reading). Because of this, it isn't clear that their actual positions are in tension with mine, which is a more detailed view in the spirit of (1_{ca}):

Conditional Attitude Ascriptions: Suppose that a sentence of the form 'A Xs that S' is used to ascribe an attitude, *x*, with content, *c*, to the referent of *A*. Then a sentence of the form 'A Xs that S if T' is used to ascribe a conditional version of *x*, with content, *c*, and a condition given by *T* to the referent of *a*.

In this section, I'll show that a reading of (1) like (1_c) is not witnessed in general and that Conditional Attitude Ascriptions is a more plausible generalization.

Jerzak's (2019) account of "wants," which presupposes an information-sensitive view of conditionals, might suggest rejecting Conditional Attitude Ascriptions. Suppose John prefers to buy the type of wine that will most please his dinner comrades, but he doesn't know which wine that is. It is appropriate to say:

(2) If his comrades prefer the Zinfandel, he wants the Zinfandel.

(3) If his comrades prefer the Sauvignon Blanc, he wants the Sauvignon Blanc. (Jerzak 2019, 74)

Jerzak secures the truth of these conditionals by (i) making "wants" information-sensitive—what a person wants is what has the highest expected utility given their preferences and the information state and (ii) letting the conditional take wider scope, so that we evaluate the "wants" consequent relative to an information state updated by the antecedent. Move (ii) makes Jerzak's account yield readings like the (1_c) reading of (1):

- (2_c) If [John's comrades prefer the Zinfandel, Want [John, John buys the Zinfandel]]
 (3_c) If [John's comrades prefer the Sauvignon Blanc, Want [John, John buys the Sauvignon Blanc]]

So, if John has a strong preference for honoring his comrades wine tastes, then updating the information state by the antecedents of (2) and (3) about John's comrades preferences makes the corresponding "wants" claims in the consequents—and, so, the conditionals—true.

Jerzak acknowledges that (2) and (3) are similar to advisory "ought" statements. I claim that they are different from ascriptions of mental states that the subject actually has.⁹ Suppose I say before a lecture begins:

- (4) I want to present an objection if I think of a good one.

I am self-ascribing a current conditional desire even though it may not be clear now whether I will think of a good one. I am not merely asserting a conditional with a "wants" ascription in the consequent. That is, (4_{ca}) looks like a more accurate paraphrase of what I convey with (4) than (4_c) does:

- (4_{ca}) Conditionally Want [I, I think of a good objection, I present that objection]
 (4_c) If [I think of a good objection, Want [I, I present that objection]]

Furthermore, we cannot plausibly extend Jerzak's picture to other attitudes. When a speaker utters (1), they aren't communicating a sort of advisory reading. Such a (1_c)-style reading would allow the speaker to utter (1), find out that Josephine's favorite team is in town, and, so, conclude that Josephine intends to go to the game. But Josephine does not intend to go to the game in such a scenario. The speaker's reasoning would be inaccessible to Josephine, herself. And Josephine would not evince the key dispositions of the functional role of that intention, like a disposition to intend the means to her intended end (for example, to intend to take the bus to the stadium). Instead, it seems more plausible that in uttering (1), the speaker ascribes to Josephine a state that is useful in her own contingency planning. The speaker ascribes the sort of state that, if Josephine is in that state, lets her plan about what to do on the contingency that her favorite team is in town (Ferrero 2009; Ludwig 2015). For instance, that state might lead Josephine to form an ordinary plan to find out if her team is in town and a contingency plan to take the bus to the stadium if she finds out that they are.

Jerzak notes that belief ascriptions don't work like (2) and (3) either for similar reasons. If there is a true interpretation of (5), it is not (5_c):

- (5) If his comrades prefer the Zinfandel, he believes that the Zinfandel is the wine to get.
 (5_c) If [John's comrades prefer the Zinfandel, Believe [John, the Zinfandel is the wine to get]]

Cases where we're interested in ascribing attitudes that someone holds are different from the advisory uses of "wants," and it is on these cases that I focus. In these cases, uses of sentences

⁹We can see this by focusing on the information-relativity of these states (though see Jerzak [2019, sec. 7]) for a picture of the structure of our desires that tries to explain this feature of some of our ascriptions). Whether an ascription of an advisory "want" is true varies with the assessor's information state. So, the truth of these ascriptions can change without anything about the world—including about the subject's mind—changing. Furthermore, Jerzak notes that those he's surveyed say it is difficult, if not impossible, to get the desired readings in translations of (2) and (3) in German, Spanish, and French. From my own informal surveys, things aren't so clear cut. My Mandarin informant suggests that a sentence like (2) can be read as ok if it is understood as:

- (2') If his comrades prefer the Zinfandel, what he wants is the Zinfandel.

Unfortunately I don't have space to pursue the implications for Jerzak's account. Thanks to Mengqun Sun and Indrek Reiland for discussion.

involving conditionals and verbs like “intends,” “believes,” and even “wants” are not merely assertions of conditionals whose consequents include attitude verbs. They are ascriptions of conditional attitudes.

Other authors claim that a wider class of attitude verbs often get wide-scope conditional readings. Drucker’s (2019) Policy Externalism suggests this for cases involving attitudes like “hate,” “regret,” and “admire” (see also Drucker [Forthcoming]). He explicitly rules out “believe” from having these features. This is because believing a proposition implies being able to use it in practical and theoretical reasoning but beliefs held simply because conditions are unknowingly met can’t be used in this way (Drucker 2019, 268–71). I suggest that similar concerns apply to credence and, when considering practical reasoning, intention. Drucker is ambivalent about desire (alternately, 271 and 280), but I think there is a case to be made that it too plays a role in reasoning and decision making.

Blumberg and Holguín (2019, 379) suggest wide-scope conditional readings for “virtually *all* attitude reports,” though they note significant differences across attitudes. I can’t fully address the nuances of their and Drucker’s views and will merely note a few things. First, Conditional Attitude Ascriptions is a pragmatic thesis. It is compatible with a semantics that allows or privileges wide-scope conditional readings. I’ll show one suggestion for how that might go below. Second, insofar as these readings are not forced, they are not in deep conflict with Conditional Attitude Ascriptions. Two authors concerned with ascriptions of conditional intentions (Ferrero 2009, 701–2; Ludwig 2015, 32), distinguish between ascribing conditional intentions and asserting or predicting what one will intend if the condition holds. The former involves a current commitment while the latter doesn’t. Conditional Attitude Ascriptions concern the former readings. Finally, if some attitude verbs—and this may be true of Drucker’s examples of “regret” or “admire”—only yield wide-scope conditional readings and don’t pragmatically convey conditional attitudes of the sort I’m interested in, we could restrict Conditional Attitude Ascriptions to sentences involving other attitude verbs, like “intends,” “believes,” and “wants.”

We’d like to explain Conditional Attitude Ascriptions from a combination of the semantics of the terms involved and general pragmatic principles. One option is to give a semantics for these sentences out of which it straightforwardly falls. One way to do so is to give a compositional picture, enriching attitude verbs with argument places for the condition and the content. The antecedent of the conditional supplies the condition. The idea is that a form like (1_{ca}) is compositionally derivable. And in what appear to be unconditional attitude ascriptions, the condition is a covertly or contextually supplied tautology (this is inspired by Hájek [2003] on conditional credences and McDaniel and Bradley [2008] on conditional desires). Developing the details of such a picture in a plausible way is challenging, so this sketch will have to do for now. Alternatively, we could give a noncompositional semantic picture. For instance, Ludwig argues that the way of expressing conditional attitudes described in Conditional Attitude Ascriptions is idiomatic—it doesn’t derive from the compositional account of attitude verbs and conditionals—and “has arisen to fill a semantic gap in the language” (2015, 51).

Since Conditional Attitude Ascriptions is a pragmatic thesis, it may be compatible with the semantic pictures of Jerzak, Drucker, or Blumberg and Holguín. According to Blumberg and Holguín (2019), attitude verbs commonly have restricted readings. For instance, consider (6) uttered by someone who does not know whether it is Chris who is injured:

(6) If Chris injured himself horribly on the tennis court, then I regret that I ever taught him how to play.

Blumberg and Holguín explain why (6) seems true but (7) doesn’t, even in cases where Chris did injure himself:

(7) I regret that I ever taught him how to play.

It is because “regret” takes a restricted reading. The speaker regrets that they taught Chris how to play on the assumption that he injured himself horribly on the tennis court, even though the speaker doesn’t regret it independently of this assumption. A natural hypothesis is that in many cases, the antecedent of a conditional provides a restriction for an attitude verb that appears in the consequent (Blumberg and Holguín 2019, 387–88).¹⁰ What is important for us is that it is plausible that uses of these sentences with restricted readings also ascribe conditional attitudes, as in Conditional Attitude Ascriptions. Why would we utter conditionals with restricted attitude ascriptions in the consequent? A natural answer is that these restricted attitude readings express something very much like claims about the attitudes that the bearer is disposed to or is committed to having upon learning that the condition is true. So, from this reading, a hearer can infer that the subject has the corresponding conditional attitude.

4. Attitudes about what is likely and probabilistic propositions

Suppose that I say:

(8) Fertz believes that it is likely that it will be sunny tomorrow in Phoenix.

A natural first pass at the attitude I ascribe to Fertz says that the *type* of attitude is belief and the *content* of the attitude is the proposition that it is likely that it will be sunny tomorrow in Phoenix. However, I will discuss some reasons why this natural first pass has been rejected by many in the literature.¹¹

First, it doesn’t seem like there is a notion of probability that can feature in these sorts of thoughts. In the literature on what are called *interpretations of probability*, none describe the thought I ascribe to Fertz (Christensen 2004, 18–20). His belief is not about some relative frequency of sunny tomorrows to possible tomorrows. Nor is his belief about the objective physical probability or quantum chance of sun. Most plausible is the hypothesis that his belief is about evidential probability. But even this looks problematic. Suppose Fertz knows that his evidence either definitely supports it being sunny tomorrow in Phoenix or supports, to degree 49 percent, it being sunny tomorrow in Phoenix, but suppose that he can’t figure out which. In such a case, he may reasonably think that it is likely that it will be sunny tomorrow in Phoenix. But it looks like Fertz doesn’t believe that the evidential probability of sun tomorrow in Phoenix is merely high; he thinks it is either 100 percent or 49 percent. So, evidential probability seems not to be a constituent of the content of his thought (Konek 2016, 514).¹²

Second, even if there is a concept of probability that avoids the previous argument, we still can’t make sense of the range of true ascriptions we make with sentences like (8). Price (1986, 19) and Frankish (2009) claim that we can truly ascribe a thought that it is likely that it will be sunny tomorrow in Phoenix to a young child that has no concept of probability *at all* (see also Yalcin’s (2007, 997; 2011, 308) example of the dog thinking he might get my table scraps). So, some ascriptions of likely-thoughts are not ascriptions of beliefs in probabilistic contents. And, since the

¹⁰Things are actually somewhat more complicated. As Blumberg and Holguín (2019) point out, the data they are after are complex and resist easy analysis. Additionally, my cases have features that conflict with their provisional analysis—the antecedent often follows the consequent in surface structure and they often involve third personal reports. Whether their framework can do all they want *and* all I want is unclear.

¹¹Lance (1995), Weisberg (2013), and Moon and Jackson (2020) defend the position (though Lance talks about acceptance rather than belief) and Lennertz (n.d.) highlights some of its virtues. See also Hawthorne and Stanley 2008. Moss (2018) defends a close variant, though on her picture, the contents of beliefs are not propositions. Because of this, her view avoids some objections to the natural first pass.

¹²Thanks to Ed Elliot for drawing my attention to this case. See Ross (2006, 189) for a general presentation and Moon and Jackson (2020, 665–66) for a reply.

thought we ascribe to Fertz is the same sort that we would ascribe to a child, it seems that in uttering (8), we are not ascribing a belief in some probabilistic content.

Finally, there are formal triviality results that can be interpreted to suggest that Fertz's thought is not a belief with a probabilistic content (Russell and Hawthorne 2016; Schroeder 2018; Goldstein 2019). While the results merely show that several plausible principles are incompatible, one conclusion we might draw goes as follows: take for granted a notion of being 60 percent confident in a proposition, p . Then there is no other proposition, q , that a person must be completely or very confident in just in case one is 60 percent confident in p . This might be interpreted to show that, for instance, there is no proposition that it is likely that it will be sunny tomorrow in Phoenix, which can be the object of Fertz's belief.¹³

It may seem that the arguments I've given cannot be decisive because there is no way to make sense of (8) other than as an ascription of a belief in a probabilistic proposition. This isn't so. Here are two rough ways of dividing attitude and content:

- (8_{bel}) Believe [Fertz, it is likely that it will be sunny tomorrow in Phoenix]
 (8_{cre}) Believe-it-is-likely [Fertz, it will be sunny tomorrow in Phoenix]

In (8_{cre}) the attitude ascribed is not an ordinary belief. It is a belief-that-it-is-likely, high confidence, or credence. The content is an ordinary one—the proposition that it will be sunny tomorrow in Phoenix.¹⁴ The reasons discussed above suggest we should make sense of ascription as (8_{cre})—high credence in an ordinary proposition—rather than (8_{bel})—belief in a probabilistic proposition.¹⁵ More generally:

Credence Ascriptions: Where A refers to a person, a , N refers to a number, n , and P refers to a proposition, p , a sentence of the form 'A believes that it is N -likely that P ' is typically used to ascribe to a an n -strength credence in p , not a qualitative belief that p has a probability of n .

We have talked about ascriptions like (8). What about when we simply say:

- (9) It is likely that it will be sunny tomorrow in Phoenix.

It is natural to think that, usually, when we sincerely utter a declarative sentence, we assert a proposition that is the information that sentence conveys. But the reasons given above suggest that there is no proposition *that it is likely that it will be sunny tomorrow in Phoenix*:

No Likely Propositions: In typical contexts, there are no propositions expressed by sentences of the form 'It is N -likely that P '.¹⁶

¹³None of the authors mentioned interprets the results in quite this way, but we could follow Edgington's (1995, sec. 6) similar way of interpreting Lewis's (1976) famous triviality result about conditionals (rather than "likely"); One might also take some inspiration for rejecting the first pass understanding of (8) from data about how some attitude verbs but not others readily accept "might" in the complement. See Hacquard and Wellwood (2012) for a corpus study and Anand and Hacquard (2013) for a nuanced discussion. An additional reason to doubt that a sentence like (8) is used to ascribe a belief in a proposition comes from the existence of asymmetric disagreement between a person who thinks something might be or probably is the case and a person who think it isn't the case (Lennertz 2019).

¹⁴According to this picture, a credence of .75 is a different attitude from a credence of .76. We might, instead, think that the attitudes are the same but that there is another feature to account for the degree. Yalcin (2012a) advocates a picture where in addition to an attitude type and a content, there is a *structural character*. Whether or not we accept this more complex story does not affect our discussion. What is important is that the probability is not part of the propositional content.

¹⁵This popular idea appears many places, including Yalcin (2012a, 133–34) (modulo the issues from note 14). Rothschild (2012, 107) puts forward a nearby thesis that he calls *Belief Transparency*. Schroeder (2013) presents a general view allowing that there is a sense in which both (8_{bel}) and (8_{cre}) are correct.

¹⁶I restrict this principle to typical contexts to allow that in some less ordinary contexts we use "likely" to describe one of the above concepts of probability like frequency or objective chance.

What, then, are we doing when we utter sentence like (9)? A reasonable answer is that we are not asserting a proposition or describing the world. Rather, as many suggest, inspired by work as far back as Ramsey (1926), we are expressing our high credence that it will be sunny tomorrow in Phoenix.¹⁷

5. Conditional attitudes about what is likely

Consider:

- (11) Jimmy believes that it is likely that a Democrat will win.
- (12) Jimmy believes that it is likely that a Democrat will win if the economy improves.

Given Conditional Attitude Ascriptions, (12) is used to ascribe a conditional version of the attitude ascribed using (11), with the condition being the proposition that the economy improves. Given Credence Ascriptions, the attitude ascribed to Jimmy by a use of (11) is a high credence in the proposition that a Democrat will win. Putting these conclusions together, we see that in using (12), one ascribes to Jimmy a high conditional credence that a Democrat will win on the condition that the economy improves. More generally, Conditional Attitude Ascriptions and Credence Ascriptions yield:

Conditional Credence Ascriptions: Where A refers to a person, a , N refers to a number, n , and P and Q refer to propositions, p and q , a sentence of the form ‘ A believes that it is N -likely that P if Q ’ is typically used to ascribe to a an n -strength conditional credence in p given q .¹⁸ (Swanson 2016, 134)

¹⁷Yalcin (2012a, 125) suggests, “. . . in asserting something like

- (10) Allan is probably in his office

one may express an aspect of one’s credal state, without describing that state. One expresses one’s confidence, that is, without literally saying that one is confident.” See Rothschild (2012, 103) for a similar proposal that in uttering these sorts of sentences, we are suggesting that conversational participants adopt a given credal state. (Also see Price 1983; Swanson 2006; 2016; Yalcin 2007; 2011; 2012b; and Moss 2015; 2018.)

¹⁸A reviewer asks about apparent ascriptions of conditional *intentions* with probability terms in the consequent:

- (13) I’ll likely go to the store today if it’s open.

The trouble comes from the interaction between the intention and “likely,” not the conditionality, so I’ll simplify:

- (14) I’ll likely go to the store today.

A speaker can use this sentence to communicate an intentionlike attitude. Two obvious options for the form of the ascription can be paraphrased:

- (14_I) I intend that I likely go to the store today.
- (14_L) It is likely that I intend that I go to the store today.

(14_I) seems in tension with the conclusion in section 4 that there are no propositions about what is likely. Furthermore, my intention is to go to the store, not make something likely. (14_L) expresses high credence that one has that intention. But uncertainty about one’s own intentions isn’t what a speaker who utters (14) expresses. It looks like we’re in a bind, but there are two other plausible ways to understand (14). Inspired by the expression of credence picture from section 4, the first says that I express a partial intention in uttering (14) (perhaps of the sort suggested in Holton [2008], Shpall [2016], Goldstein [2016], or Beddor [2020]). The second says that I express both an ordinary intention and high but not total confidence that I will go to the store. I must save a comparison of these suggestions for another place.

6. Newfangled Conditional Attitudes

We just saw one way that our theses about ascribing conditional attitudes and ascribing credences interact—in ascribing conditional credences. Another way that they can interact has not been much discussed in the literature. These are cases where “likely” occurs in the *antecedent* of the conditional.¹⁹

Pepe is deliberating about whether to go to the game. She knows that the manager has decided who will pitch but won’t announce his decision publicly. Pepe doesn’t now know how likely it is that Kershaw will pitch, but she is going to watch the manager’s press conference before the game. After that, she expects to have thoughts about how likely it is that Kershaw will pitch, though she doesn’t expect to know whether he will or not. She likes going to games where Kershaw pitches, though she doesn’t care for games where someone else pitches. Before the press conference, a friend asks Pepe if she’s going to the game. She responds:

(17) I intend to go to the game if it is likely that Kershaw will pitch.

What attitude does Pepe self-ascribe? Given Conditional Attitude Ascriptions, we should think it is a conditional intention. However, there is something strange about it, since the condition is picked out by:

(18) It is likely that Kershaw will pitch.

Given No Likely Propositions, (18) doesn’t express a proposition. So, we have a conditional intention with a condition that isn’t a proposition. That is, we have a counterexample to Two Arguments in Conditional Attitudes. If this is right and propositions are the bearers of truth and falsity, then the satisfaction conditions of the attitude ascribed can’t be those given by Satisfaction of Conditional Attitudes.

Similar examples arise with other types of attitudes. For example, it may be that Lynn does not now want to present her obvious objection, since she doesn’t want to waste the speaker’s time, but she wants to present her obvious objection if it is somewhat likely that the speaker hasn’t heard it. Likewise, Robert does not think that it is likely that a Democrat will win the election, but he thinks it is likely that a Democrat will win the election if it is likely that Elizabeth is nominated. Finally, Len does not believe that school will be canceled but he believes that it will be if it is likely there will be a blizzard. Given Conditional Attitude Ascriptions, these are conditional attitudes, but given No Likely Propositions, the condition of each is not a proposition. So, they also are counterexamples to Two Arguments in Conditional Attitudes and Satisfaction of Conditional Attitudes.

One might worry that in each of these cases, the subject really has a related conditional attitude—one where the condition is the proposition expressed by what comes *after* “likely.” For instance, Len believes that school will be cancelled if there is a blizzard (with no mention of the *likelihood* of a blizzard). While there may be cases like this, there are also cases where Len believes that school will be canceled if it is likely that there will be a blizzard, even if in the end there isn’t one. I, at least, have

¹⁹Understanding conditionals with probabilistic antecedents and consequents is a central goal of Moss’s theory (2015; 2018, sec. 4.2). Yalcin briefly discusses conditionals with “probably” in the antecedent and deontic modals in the consequent:

(15) If the restaurant is probably open, we ought to go. (2012a, 155)

These are related to Jerzak’s advisory uses of “wants” in conditionals with probabilistic antecedents:

(16) If it’s probably going to rain, Ahmed wants you to take the small umbrella. (2019, 81)

All of these authors enrich information states with probabilistic structure to make sense of these conditionals. I’ll use a similar enriched state in my account below.

been in this very scenario. What was most important to me as a child was that a blizzard was likely, since this, and not the actual appearance of a blizzard, would ground the decision to cancel school. And this conditional belief would be useful to Len when he does not expect to know soon whether there will be a blizzard, but he does expect to soon have an informed credence about whether there will be (for instance, if tomorrow's forecast will be broadcast soon).²⁰

When we ordinarily think of conditional attitudes, we think of a condition that describes the state of the world, a proposition. Call these *old-fashioned conditional attitudes*. But, if No Likely Propositions is true, when we talk about it being likely that Kershaw will pitch, we aren't asserting a proposition. So, some conditions aren't propositions, and the conditional attitudes discussed in this section are not old-fashioned. Call them *newfangled conditional attitudes*. As we have seen, Two Arguments in Conditional Attitudes and Satisfaction of Conditional Attitudes don't apply to newfangled conditional attitudes. In the next section, I will sketch a general picture of conditional attitudes along with alternative principles that account for the newfangled variety.

7. A general picture of conditional attitudes

We will take two steps toward our new picture of conditional attitudes. The first is a subject of debate independent of any probabilistic component. The original statement of Two Arguments in Conditional Attitudes says that the condition of the attitude is a proposition, and the original statement of Satisfaction of Conditional Attitudes says that the question of the satisfaction of the attitude arises only when that proposition is true. But we might think that what matters is not simply whether the antecedent proposition is true but also whether the attitude bearer *takes* it to be true. As Ferrero says, "if the agent intends to ' ϕ if C ,' she is under a rational demand to ϕ only when she *takes* C to obtain that is, only when she either believes or accepts that C is the case" (2009, 702). And, since we might think that the rational demand is to do what satisfies the attitude, it would follow that the agent's grasp of the condition is relevant to the satisfaction of a conditional attitude.

We can see why this is attractive by reflecting on the functional role of conditional attitudes. In the case of conditional intentions, this means reflecting on their role in contingency planning (Ludwig 2015). Suppose that Josephine intends to go to the game if her favorite team is in town. That intention doesn't aid in planning and practical reasoning even if her favorite team is in town until she comes to have a view on the matter. If she comes to believe that her favorite team is in town, this conditional intention serves the same functional role as an ordinary intention to go to the game. For instance, it is governed by characteristic rational norms on intentions—for example, to intend the means to satisfying the intention and to not intend what she believes to be impossible (Bratman 2009; Ferrero 2009). Similar things seem true of the relationship between other conditional attitudes and their simple versions. Conditional belief plays the role of representing how the world is in a person's theoretical and practical reasoning, once the believer comes to believe the antecedent; conditional desire plays the role of inclining one toward some state of affairs, once the desirer comes to believe the antecedent. In general, the idea is that if one has an old-fashioned conditional attitude and one comes to believe the antecedent, then one's attitude serves much the same role as an ordinary attitude with the same content.

Furthermore, it doesn't seem that the truth of the condition of a conditional attitude is enough to, by itself, raise the question of satisfaction of that attitude. There must be some condition about the agent's grasp. For example, consider a case where Josephine's favorite team is in town but she can't figure out whether or not they are and, so, does not go to the game. Do we say that she failed to carry out her conditional intention? Did she fail to do what she intended? The natural answer, I think, is

²⁰Ludwig (2015) claims that we have conditional thoughts when we can reasonably expect to learn whether the condition obtains.

no. She wasn't in a position to either do or fail to do what she intended because she didn't grasp that the condition held.²¹

On the other hand, the agent's belief about the condition isn't all that matters for raising the question of satisfaction. It seems that the condition must also be true. For instance, suppose that Josephine has a conditional intention to buy tickets to the game if her favorite team is playing. Further, suppose that she thinks her favorite team is playing and she buys tickets to the game but, in fact, they are not playing. We don't want to say that she has succeeded in carrying out her conditional intention in such a case. After all, her team isn't even playing. But a purely doxastic condition risks saying just this.²² So it looks like both whether the condition holds and the agent's grasp of it matter for whether the question of the satisfaction of a conditional attitude arises. A natural hypothesis, then, is that the question of satisfaction arises when the agent is in the right state of knowledge.

In light of this, we might want to make a change from *Two Arguments in Conditional Attitudes* and *Satisfaction of Conditional Attitudes*. This change says, roughly, that the condition of a conditional attitude is a state of belief and the question of satisfaction arising depends on whether the subject is in that state and that state constitutes knowledge. More precisely:

Two Arguments in Conditional Attitudes' Conditional attitudes have two arguments, a set of belief states which plays the role of the condition and a proposition which plays the role of the content.

Satisfaction of Conditional Attitudes' One satisfies a conditional attitude if one's knowledge state is a member of the condition and the content is true, one fails to satisfy it if one's knowledge state is a member of the condition and the content is false, and the issue of satisfying it doesn't arise if one's knowledge state is not a member of the condition.

Remember that a belief state is a set of possible worlds left open by a set of beliefs. Now let a knowledge state be a set of possible worlds left open by a set of pieces of knowledge. In *Satisfaction of Conditional Attitudes'*, I talk about a person's knowledge state being a member of the condition, which a set of belief states. Given what knowledge states are, this is a more formal way of expressing that the person has the knowledge expressed in the condition. Consider, for example, Josephine's intention to go to the game if her favorite team is in town. The condition that Josephine's favorite team is in town corresponds to the set of belief states that include the belief that Josephine's favorite team is in town (i.e., the set of belief states each of which only includes worlds in which Josephine's favorite team is in town). The question of whether the conditional attitude is satisfied arises when her knowledge state is a member of that set—i.e., when she knows that her favorite team is in town. One advantage of talking in terms of belief and knowledge states rather than individual beliefs and knowledge is that it allows us to make sense of conditions that a person might meet in more specific ways. For instance, suppose Josephine has an intention to go to dinner if it is at her favorite restaurant or she is the guest of honor. And suppose she comes to know that she is the guest of honor. Then the question of whether her intention is satisfied arises regardless of whether or not she

²¹One might take the opposite position, claiming that she did fail to carry out her conditional intention, but give an alternative explanation our judgment in this case. Perhaps we are reticent to say that she failed to carry out her conditional intention because we don't want to suggest she is blameworthy for not satisfying her conditional attitude. I have no decisive argument against this alternative view of the case. But I think there are two theoretical reasons to prefer my picture. First, other things being equal, we should prefer a direct explanation of our judgments about this case to one that explains away these judgments. Second, and more importantly, my picture, as I will show, generalizes to capture the satisfaction conditions of newfangled conditional attitudes, while the objector's does not. This is because, as argued in section 4, there is no worldly, attitude-independent characterization of the condition being true for such attitudes. Thanks to a reviewer and an editor of this journal for discussion.

²²Thanks to an editor of this journal for urging me to confront this case.

comes to have any thoughts about the disjunction that dinner is at her favorite restaurant or she is the guest of honor. This is captured by our representation.

In addition to the reasons presented in the previous pages for moving to Satisfaction of Conditional Attitudes', the ease with which it allows us to generalize to the probabilistic case is a mark in its favor. There needn't be anything special about a belief that constitutes knowledge in the picture sketched in the first step. Another similar attitude could serve the role. Suppose that in addition to beliefs constituting knowledge, it is possible for credences to constitute knowledge (Moss 2013; Konek 2016). Then, a person could have a conditional attitude which, instead of having belief as its condition has a credence serving that role. And the question of satisfaction of this conditional attitude would arise in cases where the bearer of the attitude had that credence and it constituted knowledge. This would make sense of our target thought—an intention to go to the game if it is likely that Kershaw will pitch. It is a state of mind that, when the person comes to have a high credence that Kershaw will pitch, has the functional role of an intention to go to the game. And when that high credence that Kershaw will pitch constitutes knowledge, the question of satisfaction of the conditional intention arises. It is satisfied in cases where the bearer goes to the game and fails to be satisfied in cases where they don't. In general, the functional role of conditional attitudes is largely the same for old-fashioned or newfangled ones, and the satisfaction conditions are similar as well. The major difference is that beliefs play a role in old-fashioned ones while credences play that role in newfangled ones.

I've been talking about satisfaction in the newfangled case by talking about credences which constitute knowledge. But traditional pictures think of knowledge as true *belief* together with some other justificationlike conditions (Plato 1992; Gettier 1963; Nozick 1981). And popular views that reject this structure usually still claim that knowing entails believing (Williamson 2000). Realizing that these claims about belief are intended to be about ordinary or qualitative belief, in what sense can I maintain that credences can be the doxastic attitude in an instance of knowledge? Sarah Moss makes a compelling case that credences can constitute knowledge (2013; see also Konek 2016). She argues that many of the central hallmarks of beliefs that constitute knowledge can hold of credences as well. She shows that a notion of factivity applies to credences that constitute knowledge. For instance, she argues that knowing that a proposition is likely—having a high credence in that proposition, which constitutes knowledge—entails that that proposition is likely. She also shows how the notions of safety (Williamson 2000; Pritchard 2005) and sensitivity (Nozick 1981) can apply to credences that constitute knowledge, just as they do in the case of beliefs. I won't defend the claim that safety and/or sensitivity are necessary for knowledge, but they do apply in many cases. And this is true with both beliefs and credences. For instance, just as, in most cases, knowing some proposition, p , implies that the nearby scenarios where I continue to believe p are p -scenarios, knowing that p is likely implies that the nearby scenarios where I continue to have high credence in p are scenarios where it is still likely (safety). And just as, in most cases, knowing p implies that in nearby scenarios where not- p , I don't believe p , knowing that p is likely implies that in nearby scenarios where p is not likely, I don't have high credence in p (sensitivity). Additionally, Moss shows that there are Gettierlike cases (Gettier 1963) involving credences that don't quite constitute knowledge, just as there are for beliefs. I don't have space to fully corroborate Moss's position here, but I think this makes it plausible enough to rely on it in my account of conditional attitudes.

With this in hand we can see a sense in which the conditions of old-fashioned conditional attitudes are similar to those of newfangled ones; both conditions are doxastic attitudes. But there is also a sense in which the conditions of old-fashioned conditional attitudes are different from those of newfangled ones; the former are ordinary beliefs while the latter are credences. Nonetheless, we can represent them jointly using what I'll stipulatively call a *doxastic* state. We already know that a person's belief state can be modeled as the set of possible worlds left open by what they believe. A person's credences are often modelled by a probability function. But I'm going to take a more general approach, since a person might reasonably be undecided about all sorts of matters that would be required for a probability function to represent them. I'll call this a partial probability

function, which I will suppose is still a function from propositions to real numbers.²³ Their doxastic state is then an ordered pair of their belief state and partial probability function.²⁴ From this, we can give a stipulative definition of an *epistemic* state. An epistemic state is a doxastic state for which all of the beliefs and credences that determine the state constitute knowledge.

As we did with a set of belief states, we can use a set of doxastic states to catalogue all of the ways of having a thought. I want to introduce notation for a set of doxastic states, $|S|$, corresponding to a sentence, S . This is the set doxastic states that a person could have while accepting S .²⁵ For instance, consider:

- (19) The store is open.
- (20) The manager is likely to be there.
- (21) The store is open or the manager is likely to be there.

$|{(19)}|$ only places substantive constraints on the set of worlds of the doxastic state; it is partial probability function invariant.²⁶ $|{(19)}|$ contains all pairs in which the first member is a set that contains only worlds in which the store is open, regardless of the partial probability function of that pair. A person thinks that the store is open when their doxastic state is a member of $|{(19)}|$. $|{(20)}|$ only places substantive constraints on the partial probability function of the doxastic state; it is world invariant. $|{(20)}|$ contains all pairs in which the second member is a partial probability function that assigns a high value to the proposition that the manager is there, regardless of the set of worlds of that pair. A person thinks that the manager is likely to be there when their doxastic state is a member of $|{(20)}|$. $|{(21)}|$ is a mixed constraint. It contains all pairs in which either the first member is a set that contains only worlds in which the store is open or the second member is a partial probability function that assigns a high value to the proposition that the manager is there. That is, the disjunctive sentence corresponds to the expected constraints on sets of doxastic states—one of the disjuncts must hold. Expected strategies work for negation and conjunction, as well.²⁷ So, a person thinks that the store is open or the manager is likely to be there when their doxastic state is a member of $|{(21)}|$.

²³What should we say are the normative constraints on such a partial probability function? It should still be true that the function yields values in $[0, 1]$. Perhaps restricted versions of the normalization and additivity axioms of probability theory should apply to it as well—versions which hold *if* the function is defined for the relevant propositions.

²⁴A doxastic state is related to what some authors call a probabilistically enriched information state (Yalcin 2007; 2012a, 155; 2012b; Jerzak 2019; see Swanson 2016 on the related enriched probability measure). The difference is that I've moved from using genuine probability functions to other functions. This is related to the fact that doxastic states are determined by a person's actual beliefs and credences, while information states are merely formal objects. It is also worth noting that a person's beliefs and credences are often modelled by a set of probabilistically enriched information states, where the probability function might be different in different pairs. This has the advantage of allowing for the representation of imprecise credences (Moss 2018). My picture could be generalized in this direction, but our central topic is independent of this idealization.

²⁵A set of doxastic states is related to what Swanson (2016, 123) calls a *constraint*, which plays a central role in his constraint semantic picture.

²⁶We might think that though accepting (19) does not directly constrain the partial probability function, it does so indirectly. For if one believes that the store is open, one should at least not have low confidence that it is. So, it looks like $|{(19)}|$ should not be partial probability function invariant. However, this reasoning isn't sound. It is a plausible rational constraint that if one believes that the store is open, one should at least not have low confidence that it is. But we should not restrict our representations of people's thoughts to only those that are rational. What we're trying to get at in the representation $|{(19)}|$ is what a person's mind is like in virtue of accepting (19). This is not meant to apply only to rational people. Now, perhaps there is a metaphysical connection between belief and high confidence. If that's right, we could introduce extra constraints on the partial probability function of $|{(19)}|$. But such a metaphysical connection is more contentious than the normative connection, and I'll avoid assuming it here. Thanks to an anonymous reviewer for raising this issue.

²⁷This is not a complete explanation of compositionality, but is meant to sketch how one might go. For pictures in this ballpark, see Yalcin (2012b), Willer (2013), Moss (2015), Swanson (2016), and Charlow (2020). Moss (2015) and Charlow (2020) are explicitly concerned with iterated modalities and credences over epistemic possibilities.

This representation helps us understand conditional attitudes with mixed conditions. Consider the ascription:

(22) John intends to go to the store if the store is open or the manager is likely to be there.

As we just saw, (22)'s antecedent, (21), corresponds to a mixed set of doxastic states, |(21)|. A conditional intention to go to the store if it is either open or the manager is likely to be there is an attitude that has the functional role of an intention to go to the store in cases where the bearer's doxastic state is a member of |(21)|—that is, where the bearer either believes that the store is open or has high credence that the manager is there.²⁸ And the question of whether the conditional intention ascribed in (22) is satisfied only arises when the condition is known—the bearer either believes that the store is open and that belief constitutes knowledge or has high credence that the manager is there and that credence constitutes knowledge.

I've been talking about conditional attitudes in a somewhat roundabout way—a state that has the functional role of the ordinary attitude given that the bearer is in particular sort of doxastic state and for which satisfaction arises when the bearer is in that doxastic state in a way that constitutes knowledge. I've done this because I want to be ecumenical about what the attitude involved fundamentally is. For example, a conditional attitude, x , in p if q (where q may or may not be probabilistic) may be a *disposition* to form an unconditional x toward p if one's doxastic state is a member of $|q|$.²⁹ Or it may be a *commitment* to form an unconditional x toward p if one's doxastic state is a member of $|q|$.³⁰ Or it may not possess these dispositional or normative connections with simple attitudes, but might simply be an x -like attitude that acts like a simple x toward p if one's doxastic state is a member of $|q|$.³¹ This last option does not attempt to reduce conditional attitudes to other mental states like dispositions or commitments.

Whichever view we take, we are in a position to record the second, generalizing step in the form of the following principles:

*Two Arguments in Conditional Attitudes**: Conditional attitudes have two arguments, a set of doxastic states which plays the role of the condition and a proposition which plays the role of the content.

*Satisfaction of Conditional Attitudes**: One satisfies a conditional attitude if one's epistemic state is a member of the condition and the content is true, one fails to satisfy it if one's epistemic state is a member of the condition and the content is false, and the issue of satisfying it doesn't arise if one's epistemic state is not a member of the condition.

These principles allow for a unified account of old-fashioned and newfangled conditional attitudes.

8. Conclusion

In this paper, I discussed and resolved an underexplored tension between popular theses about credences and conditional attitudes. I showed that plausible theses about how we ascribe these

²⁸Though I haven't presented it this way, the mixed antecedent example is a version of the Frege-Geach problem for a noncognitivist view of "likely." I have co-opted a standard response to this problem, inspired by Gibbard's (1990) ethical expressivism. See Lennertz (Forthcoming) for a wider vantage. Schroeder (2015) objects to this picture of mixed disjunctions; we might follow Moss (2015, 50–52), (2018, 77–78), or Swanson (2016, 131–34) in responding.

²⁹Price (1986) says that conditional credences are inferential dispositions. Stalnaker (1984, chap. 6) characterizes conditional belief similarly. Ludwig (2015) sometimes talks in this way about conditional intention, though Ferrero (2009) and McDaniel and Bradley (2008) oppose it; Cartwright (1990) is ambivalent.

³⁰Though Ludwig sometimes talks about dispositions, he also says, "a *conditional* intention is a commitment to a contingency plan, a commitment about what to do upon (learning of) a certain contingency relevant to one's interests obtaining" (2015, 32).

³¹Ferrero (2009) suggests that a conditional attitude plays this role when the condition becomes part of what he calls the agent's cognitive background.

attitudes are in tension with a reasonable picture of the nature of conditional attitudes. I resolved this tension by giving a more general picture of the structure of conditional attitudes and their satisfaction conditions, which retains what was plausible about our starting position.

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