

FROM TRACKING RELATIONS TO PROPOSITIONAL ATTITUDES

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ABSTRACT

I explore the possibility that propositional attitudes are not basic in folk psychology, and that what we really ascribe to people are relations to individuals, those that the apparently propositional contents of beliefs, desires, and other states concern. In particular, the relation between a state and the individuals that it tracks shows how ascription of propositional attitudes could grow out of ascription of relations between people and objects.

Key words: propositional attitudes, psychological relations, content

We often take propositional attitudes, such as “believes”, “wants”, “remembers”, as characteristic of folk psychology, the way humans understand other humans. This can seem mysterious, since we express propositional attitudes as if they were relations between individuals and propositions, and such relations are not common in our descriptions of non-mental reality. (Churchland 1981, in giving reasons to be suspicious of folk psychology, lists this peculiar propositional ontology as a prime reason. See also Morton 2009.) In this paper I argue that this is wrong. Concepts of propositional attitudes are not the *sui generis* and essential element in folk psychology. Propositional attitude language is not the core of our everyday description of mind. Rather, this language can be seen as a way of describing something less exotic. So, on the picture I shall sketch, there are facts that are easily seen to be real relations between living organisms and their environments, which can be described in the same language as everything else. Then the language can be given just a little tweak, and we get a new

way of speaking, with the appearance of describing something very different. Propositional attitude talk is thus *almost* a linguistic convenience, building on our unremarkable descriptions of the world and its inhabitants in terms of relations between them.

2. Psychological relations, propositional attitudes

Begin by noting how we rely on relations between individuals and objects in their environment when we describe actions and motives: **a** is looking at **o**, **a** is running away from **o**, **a** finds **o**. Many such relations are easily learned by young humans, and by many other animals too. Our sensitivity to the objects of attention of others helps us here (see Tomasello 2008, Morton 2002.) I take it that these relations while not exactly definable in physics, are as clear as most of the concepts we use. They are also in a basic way intentional: they concern ways in which a mind is directed at an object. We often assimilate these to a sophisticated level of thinking in terms of beliefs and desires, but it is worth bearing in mind that very small children and intelligent animals who do not have the concepts of belief and desire, can represent individuals watching or following. (An animal on the edge of a herd notices nearby predators but does not react to them. Then one of the predators begins to stalk the animal, which immediately rejoins the herd. Or a predator is stalking a prey animal. The prey animal notices the predator, and the predator immediately switches from stalking to attacking. The important relation for the prey animal is “it is watching me”, and the important relation for the predator is “it has noticed me watching it.”)

At the level of human language-based descriptions such relations are hard to separate from ascriptions of belief and desire. As many have pointed out, often what seems a simple relation between a person and an object in fact involves a proposition. Szofia wants an apple; we assume that she wants to eat it, but she may want to paint it or feed it to her cat, so to be really explicit we should say “Zsofia wants to eat an apple” or “Zsofia wants to feed an apple to her cat”. Even then there is an ambiguity; Szofia may want to eat a particular apple - some apple is such that Zsofia wants to eat it - or perhaps any apple will do - Szofia wants that there be an apple that she eats. Attitudes to non-existents are now possible. Zsofia may want the apple of eternal youth; in full content she wants that there be an apple of eternal youth that she has. These points are implicit in Brentano and familiar to readers of Quine. For my purposes I need only that everyday psychology becomes much richer, but also more puzzling, when we move from simple relations towards objects of thought to propositional attitudes. (Bertrand Russell had an account of propositional attitudes that is in some ways similar. See chapter 12 of Russell 1912. Thanks to Ori Simchen for pointing this out.)

My question is how we get from one to the other. I shall describe a possible route. It is not meant as evolutionary psychology. I am not claiming that this is how we came to understand propositional attitudes, though it might throw some light on how we actu-

ally did it. The main object is the semantic rather than the historical connection: how thoughts with one structure characterise facts with another. This may also give useful information about how to think in cases where propositional attitudes do not fit well.

2. Tracking

The starting point is a large range of relations between individual thinkers and objects of thought. It includes concepts of emotion inasmuch as they can be taken in a relational way: Toby is afraid of that spider. It also includes perception verbs: Toby sees that spider. It does not include propositional attitudes. It is remarkable, though, how in everyday language we obscure the issue of whether we are describing a relation or an attitude. We say “Zsofia sees the apple at the end of the branch” . Does she see *that* it is at the end of the branch? That is not literally asserted, but most hearers would take that as part of what is said, unless the presupposition is explicitly denied. (I think “presupposition” is the right word here, so as a general point many perceptual and cognitive relational verbs presuppose but do not entail their propositional variants.)

This can happen with thought as well as perception. We say “Zsofia wants the apple at the end of the branch” and the hearer assumes, unless warned otherwise, that Zsofia knows that is where the apple is. “Zsofia wants the apple, which will go well with the cheese in her bag” is naturally, though not inevitably, taken to communicate that she wants to eat it with the cheese. (Novelists use the device of describing from a point of view as a way of not encumbering the reader with too many explicit attitude embeddings.) It is striking how many propositional attitudes are linked to simple relations between people and things. While Toby may be afraid that the spider will jump on his head, he may also simply fear the spider. Zsofia may know or believe that the apple is on the bough, but she can also see the apple. Zsofia may want to eat the apple, but she can also hunger for it.

I am particularly interested in what one might call information-management relations, of which the central cases arise when someone tracks some property of an object, or keeps track of some information about it. These need not appeal to any complicated theory. Though we say “Toby is tracking the spider” with reference to epistemology or cognitive science, we can more informally say “Toby is watching the spider”, “Toby is keeping tabs on the spider”, “Toby is keeping track of where the spider is”. Indeed when in a non-specialist context we talk of tracking we mean actions one animal performs towards another, particularly hunting actions of following a visual or scent trail. So it is curious that in philosophy we use the term primarily for the epistemic relation of maintaining information in a way that is sensitive to changes in an object. The term comes from Robert Nozick, and is a metaphor derived from the operations of, for example, a radar system in keeping track of the location of an airplane. (See Nozick 1981 but also Dretske 1970, and obliquely but in generality Morton 1975. For a recent treat-

ment see Roush 2005.) Of course in doing this a radar system may have to perform physical actions that are like those of a hunting animal, notably in turning its antenna in the direction of the plane. Our sophisticated concepts of these things tend to include a propositional attitude component, but I am assuming that we can have simpler concepts which simply describe a relation between the person and the object. The antelope and the lion each keep track of where the other is.

Suppose that one animal is visually tracking another. We can express this just as “**a** is tracking **o**”. This is a two-place relation. But it suggests a three place relation. This is crucial to what I am saying, so I shall proceed carefully. The important fact about tracking is that it alludes to a counterfactual connection between the location of the tracked object and the subject’s actual or possible reactions to its location. If the object had been elsewhere (within a near range) then the subject would have taken it to be elsewhere. The concept of representing an object as being at a location is too sophisticated to attribute to basic psychologizers, but concepts that are linked to it, such as that of finding, are more accessible. Suppose that the object can be or move to three locations. We can assert

*if **o** is at I_1 then **a** will find it at I_1 & if **o** is at I_2 then **a** will find it at I_2 & if **o** is at I_3 then **a** will find it at I_3*

Of course there may be infinitely many possible locations and we may say things like

*wherever **o** is in R, **a** will find it*

These conditionals have counterfactual force. **o** may not stray into R so that **a** does not in fact find it, but we can still say that if it had so strayed it would have been found. And if **o** is in R and is found then we have a low-level causal explanation of why **a** found it. **a** found it because **a** has the capacity to find things like **o** in R. Instead of “find” we could use a number of other actions: “catch”, “see”, “point to”, “touch” and others. This is a basic contingent fact about the psychology of many mammals: the ability to locate an object in a way that guides one kind of action can often guide other kinds of action. (And so too with other kinds of tracking and classification, as will become important.) As a result, there is a general category of actions, which we can call locating, or indicating where. We can say of an agent that it locates an object, meaning that it is placed to catch it or find it or point at it.

When an agent can locate an object it can locate the place where the object is. You can be looking for something and an informant can show you the place, which you can identify before you can find the object. (Or they can show you, perhaps pointing to a track, the place where it was yesterday.) You can then locate doubly, the object and its location. You can imagine this as pointing at the object and at a map, but that is just a metaphor for the reality of representing the object as being at a location and representing the location as being where it is in relation to other locations. So we have a three termed relation “**a** locates **o** at **I**”. But to understand that this relation holds is to under-

stand that **a** knows that **o** is at **l**. We have made a basic connection between tracking relations and propositional attitudes.

This may seem to trade on special features of the attribute of location. But the same idea works for many other attributes too. We can point to features besides locations, for example to colours and species. One can imagine this with a colour chart or a bird-identification table. As an object changes colour in the setting sun, or as different birds appear at the feeder a person points to the appropriate colour or species. (Of course the pointing might also be by calling out the name of the colour or species, but I am temporarily keeping language out of the picture.) And one might point to both the object and the feature, indicating the bird with one hand and its colour or species with the other. Most often these pointings are done in thought, and one might describe the “two-handed” pointing as “**a** identified **o** as a towhee”. It is important here that the species or colour identification share the capacity of location identification to support a variety of actions. It does: if Toby is keeping track of what species the creatures around him are then he will become fearful if he takes one to be a spider, adopting anti-spider measures rather than anti-lion measures; he will become aggressive if he takes one to be a hunt-able source of food; he will become curious if he takes one to be an interesting bird. And, a closely related point, he can both point to that particular spider and point to all the spiders nearby, thus both identifying the spider as a spider and identifying the species as a species. So the two place relation “**a** is aware of the species of **o**” can be expanded to a three place relation “**a** identifies **o** as being of species **s**”.

It is characteristic of tracking relations that they relate the individual subject both to the object of their attention and to the attribute that they are attending to. This is a consequence of their counterfactual force. If **a** is tracking **o**'s location then **a** would be disposed to react differently if **o** were at a different location. So the connection is sensitive to the location: it is a relation to that as well as to the object, and more of its causal explanatory force is brought out when this third term is made explicit. And generally, when there is a counterfactual connection, when, that is, the implications for what can be expected of **a** depend on which value **v** in a range of values applies to **a**, we have a relation of explanatorily useful three termed relation between **a**, **o**, and **v**.

Once we have such three termed relations we are clearly on the edge of propositional attitudes. To identify the bird as a towhee is to know that it is a towhee. “**a** knows that **o** is of species **s**” is a convenient way of saying “**a** identifies **o** as being of species **s**”. To put it generally “**a** attitudes that **o** is **P**” is a convenient way of saying that **a**'s identification of **o** as having property **P** plays a particular role in **a**'s psychology”.

3. Substantiality

The approach can be applied to a range of attitudes and a range of properties. It is important to see that the analysis is not trivial and, related though it seems an opposite worry, is not asking the impossible. It might seem trivial because “**a** attitudes that **o** is **P**” is obviously equivalent to a three-place relation $A(\mathbf{a}, \mathbf{o}, P)$ between a person, an individual, and a property. For every attitude there is such a relation. But the tracking-based analysis I have given does not proceed directly through these relations, and as a result will not work automatically for any A , \mathbf{a} , \mathbf{o} , and P . They are not plausible candidates for our purposes because it is hard to see how people who did not yet attribute propositional attitudes could have any sense of them. That is the danger of triviality. (Another way of putting non-triviality: if for every property P we consider a 2-place relation “**a** attitudes **o** with respect to P ” then we are replacing a single attitude with infinitely many relations. What is needed is the 3-place relation between \mathbf{a} , \mathbf{o} , and P ; but that is not something a person can grasp without some way of separately identifying \mathbf{o} , P , and the way they are linked.) Instead of doing it this way, I am postulating a family of tracking relations, each tied to a specific family of attributes of objects (being in location l_1 , location l_2 , ..., being a robin, or an eagle, or a penguin,) Each relation has explanatory value in a straightforward way, so that it would be natural and valuable for individuals to conceive of others in terms of them. One need not even take the third argument place to range over abstract things. There is a relation “**a** points to \mathbf{o}_1 as having the colour of \mathbf{o}_2 ” where we are using objects in the \mathbf{o}_2 place as examples indexing the colours. The result is that we can suppose that there are conceptually accessible and explanatorily useful three place relations for a fair number of classes of attributes: species, locations, colours and other limited families. Such relations are available, and in fact familiar, whenever we can easily understand as keeping track of where in the range of the family an object is.

I am relating subtle and conceptually sophisticated things, propositional attitudes, to simpler things, tracking relations, whose attributions have similar consequences in terms of explaining behaviour. So tracking relations can do much of the same work, and can be thought of as possible precursors of the attitudes. But there is no claim that any of these things can be defined in terms of the behaviour that they can be used to explain. The project is not behaviouristic. The various tracking relations can be subtle and hard to learn. Our grasp of them may depend on our innate human capacities to anticipate one another. It may depend on our taking part in various practices and on our having being taught various doctrines. It may depend on our having undergone long processes of training and correction by others who have grasped them. Or, in some cases, it may depend on none of these. The point is not the kind of conceptual simplicity that goes with reduction to an easily observed or theory-independent basis, but a different kind of conceptual simplicity that consists in reduction to facts whose logical form is the more accessible basis of attributes and relations. (There is a recent

psychological literature on spatial tracking and on our limits to keep track of a number of independently moving stimuli. See Bullot and Rysiew 2007, Pylyshyn 2007.)

4. Towards false contents

The simplest examples of the process I have been describing presuppose that the individual does have the required property. So the attitude is factive: sees, finds, knows. But the analysis can be extended. For at the heart of our reductions of “**a** attitudes that **o** is P” are tracking relations between **a** and **o** and between **a** and P. It will often happen that **a** tracks **o** and **a** tracks P, although **o** is not P.

Consider first the case of false belief. In basing propositional attitudes on relations between people and objects around them we make the primary sense of propositional attitudes also concern the ways people are in fact placed in their environments. There is some psychological evidence for this in the difficulty children have in acquiring the concept of a false belief (see Perner 1991.) It is also in the spirit of recent work on the concept of belief. I am thinking first of “Millian” views that deny the Fregean intensionality of belief (as in Salmon 1986, Braun 1998.) But I am also thinking of Williamson’s suggestion that the concept of knowledge is more basic and serves a greater explanatory function than that of belief, so that, as he puts it “belief is bungled knowledge” (Williamson 2000.).

Consider for example a situation like that of a classic false belief task in which a person has to point at an object which is, unbeknownst to her, seen through a refracting panel which shifts apparent locations several degrees to the right. The object is right in front of her, at the 90 degree point, but she points to the 85 degree point. The common-sense explanation is that that is where she thinks it is. And so for any spatial activity directed at the object - touching it, catching it, shining a light at it. They are all as if they were guided by a non-factive pointing at it, a pointing that need not be accurate. Suppose we take a non-factive relation of locating as “where the person would point or reach”. (Note the idioms “grasp at”, “look for”, non-factive variants on “grasp” and “see”.) Then when someone for example believes, perhaps falsely, that their phone is in their backpack, one relational core of the belief might be that they locate the backpack at some location, and locate the phone within that location. So the formula for “**a** believes that **o** bears spatial relation R to **l**” is

a** locates **l** and **a** locates **o** at **l**₁ and **l**₁ has R to **l

Again what we have is more factive than many belief-ascriptions. But again it reveals an indirect facticity that is in fact common in ascriptions of belief, and without which we would often not be able to make sense of them. The relation I have described can serve many of the explanatory functions of a belief that **o** is at a location bearing R to **l**. It can for example be central to an explanation of why **a** looked for **o** in **l**₁, or why **a** went to **l**₁ when she wanted **o**, or why **a** was surprised when **o** was not at **l**₁.

We can do the same with other foci besides location. We can think of mentally pointing at a colour or at a species non-factively, an identification subject to an error, as in the spatial pointing discussed above.

It is decidedly unclear for what range of beliefs this style of treatment gives a relational grounding. It is significant that the style is rather loose and varied. Different propositional attitudes and indeed different beliefs will be linked to a relational basis in different ways. But it is important that it applies to a varied set of states, including a varied set of beliefs, and that some of them concern practically important topics. A natural suggestion would be that the precise import of a propositional content varies, depending on the sentence used to make the ascription and the explanatory purpose.

Consider three further examples. First Toby's fear of spiders. He is sitting down and a small spider is on the floor nearby. Toby is afraid of it, as shown by his nervous glances towards it. (Because of his fear he is tracking its location.) Things are ok as long as the spider stays where it is but if it runs up the wall Toby will be terrified. In fact, even now he is hastily putting his hat on and holding it down with his hands. His fear that the spider will land on his head is shown by his defending his head, and defending it against the spider. These are signs of a kind of tracking: Toby is keeping track of appropriate responses to various spider threats and paying attention to those that are right for jumping-on-your-head threats. In fact the spider is completely harmless and to that extent this is not an appropriate response. What Toby is tracking is responses to threats of fearsome beasts, and for him the response to being jumped on from above is extremely vivid. A response is appropriate to a threat if taking it would prevent any harm if the threat happened. Actions motivated by fear that a beast will land on your head are actions which would prevent any harm if it did land on your head. Toby is ready to do such an action, which would prevent harm from the little spider landing on his head even though there is no chance of such harm. So our formula for "*a* (Toby) fears that *o* (the spider) may *P* (jump on his head)" is:

a identifies acts e such that if o were P & a performed e then a would not be hurt

Note two features of this formula. First, it is a kind of tracking. Toby tracks ways of preventing harm from spider assaults. If an act had had a different potentiality as spider protection his attention to it would have been different. This is basic to fear: checking out weak spots in the defences. This tracking is in its own way factive, the ways of evading the spider really are ways of evading the spider, even though they are unnecessary. Second, it does not focus on the feeling of fear. It does focus on the cognitive and behavioural content of fear, namely, evading a threat, but it neglects the sense of terror or apprehension. And in fact the feeling and the escape-tracking are separable. You may know that you are afraid and be unaware that it is the spider that is making you nervous, let alone that your fear focuses on its landing on your head.

One might worry that we have described a *consequence* of fear, one that does center on a factive tracking, without having showed that this tracking is essential to fear itself. After all, many psychological states will cause some tracking activity, but to say that is not to make this activity central to them. That is a fair worry, but there is an element of misunderstanding here. The claim is not that we can analyse “*a* fears that *o* is *P*” in tracking terms, but that when *a* fears there is usually some tracking activity that is tied to it. So then an observer might record the presence of this activity and use it as a predictor. and even in many cases as an explanation, of behaviour that we would explain in terms of fear. And surely when someone is afraid that something may do some harmful action they do typically keep track of ways of mitigating those possible effects. So we might then say “*a* is afraid of *o*. *a* is noticing ways of escaping.” Saying “*a* is afraid that *o* may do *A*” is a later development, though one that I mention again in the next section.

Next consider desire. Zsofia’s wants to eat the apple; she sees the apple and hungers for it. There are various ways available to her to get it. She can grasp it with her hands; she can stand on tiptoe and bite it; she can wait for it to fall; she can let her mother pluck it and her father bake it in a pie. She will do whatever is easy to get it into her mouth. So the formula for “*a* wants *o* to be *P*” is

a identifies actions *e* such that if *a* performs *e* then *o* will be *P*

Again there is a kind of tracking facticity. If circumstances had been different and actions had different powers to affect *o*’s being *P*, *a* would have paid different attention to them. And again it leaves out some of the intuitive force of the state. It leaves out a sense of wanting. And it simplifies, ignoring factors that come with competing desires. An important simplification involves a facticity: to want something to be the case, on this construal, is to identify actions that would actually achieve that result. But in fact people often succeed in performing actions to achieve their desires but do not succeed in getting what they want. (There is a similar complication in the treatment of fear above.) That is not a serious problem for our purposes, as the aim is to trace a route from relational psychological concepts to propositional attitudes. The attitudes we end up with are unlikely to be those found in folk psychology as it is actually now found.

One way that the analysis of desire I have just given differs from the analysis of “knowing that *o* is *P*”, in the previous section, is that the tracking is not of *o* and *P*, but of means to *o*’s being *P*. *o* and *P* would themselves be tracked in some particular cases, though. Suppose that Zsofia wants to move the apple to a particular location, for example her mouth. She will track the location of the apple and the location of the destination, and will direct her push from the one towards the other until they coincide. The formula for “*a* wants (is trying to get) that *o* be at *I*” is

a locates *o* at I_1 and identifies actions that move *a* towards I , and will cease to identify such actions when $I_1 = I$.

5. Preparing for the evolution

The target has been the facts rather than the language. My aim has been to describe a way in which relations between individuals and objects can acquire contents and explanatory roles which make it convenient to repackage them as propositional attitudes. But there is obviously a linguistic/conceptual side too. We begin with a vocabulary used for describing and explaining humans and their actions, which has relational terms but not propositional attitudes. Then we can progressively enrich the vocabulary of relations. We can include tracking concepts, and they can be rich and subtle, as in non-factive pointings to locations, colours, and other attributes. These are in effect names of cognitively basic classificatory processes. There are a potentially a large number of them. To name most of them one needs to mention an object and a property, or two properties, which can be hard to keep track of mentally, and hard to express linguistically. But we are supposing that all this is being done by human beings, whose languages are based on recursive embeddings of one sentence in another. So it is natural that they will adapt this device to describe such relational attitudes in terms of embedded sentences. Instead of saying that **a** is tracking **o** at **I**, one says that **a** thinks that **o** is at **I**. Instead of saying that **a** non-factively location-tracks a direction as ahead and as being red, one says that **a** thinks that there is something red ahead. Instead of saying that someone feels compelled to check all the ways of protecting his head against spider attack one says that he fears that the spider may leap on his head. To do this one has to introduce verbs such as “believes”, “knows”, “wants”, “fears that”.

In terms of language, we are moving from a *n*-place relation to a 2-place relation between a person and a proposition which embeds a *n*-1 -place relation. There is nothing unusual about this. Consider the following.

“Zsofia kissed Toby in the park” can be expressed as “Zsofia kissed Toby *when they were in the park*”

“The bus hit the astronaut at the corner of Burrard and Cardero” can be expressed as “The bus hit the astronaut *where Burrard meets Cardero*”.

“They ambushed the convoy at the pass” can be expressed as “They ambushed the convoy *when it got to the pass*.”

“Toby painted the wall red” can be expressed as “Toby painted the wall so that it was red.”

(There are also connections with Donald Davidson’s treatment of action sentences in terms of events.)

There are many constructions like this in English, using *when*, *where*, *while*, *so that* to reduce the number of argument places of a relation, in ways that are like the use of *that* to introduce the complement of a propositional attitude. Embedded sentence versions are not trivial variants on the relational versions, though. If we can say “Toby

painted the wall so that it was red” we can say “Toby painted the wall so that all people were free” or “Toby painted the wall so that there is life on Mars”. These may attribute implausible power to Toby, but they are grammatical and intelligible. Similarly, once we move from “Zsofia locates the apple at the end of the branch” to “Zsofia thinks the apple is at the end of the branch” we are in a position to say “Zsofia thinks that all people are free” and “Zsofia thinks that there is life on Mars”. And these say things that one cannot using the relational idiom. Once we have them we can add more assumptions and get the full sophisticated, and treacherous, concepts of non-factive emotion, belief, and desire.

But this is my story. We start with factive relations between people and objects of thought, with respect to limited ranges of properties. These generate non-factive attitudinal relations between people, objects, and relations. The linguistic complexity of this pressures us to say, not “**a** relation **o**, P” but “**a** attitudes that **o** is P”. Then – no doubt aided by the usefulness of reporting what people have said or observed or are tending to produce in a general way – the attitudes have a life of their own. We attribute attributes and can develop propositional attitude psychology. Voilà.

6. Post script: the superficiality of propositional attitudes

That is the end of my story, at any rate of the argued part. There is a post-script, though. Suppose not only that there is, as I have argued, a path from relations between people and the objects of their interest, particularly tracking relations, to propositional attitudes, but that this is the path we humans actually took. That is speculation, of course, but it would have consequences. One is the likelihood that a lot of our thinking about other people, when we try to understand how they manage information about their environments and find means to their ends, occurs in relational rather than attitudinal terms. We use representations of tracking relations at an unconscious pre-linguistic level and in terms of them frame our expectations about what people will do. But these representations do not translate smoothly into propositional attitudes, so that thinking uniformly in terms of them is likely to be misleading. When we say that Toby fears that the spider may jump on his head the important fact may be his searching of ways of protecting his head, or his noticing where the spider is, or his searching for ways to escape. Which tracking relations to which objects are used in any particular case will be a delicate matter, not predictable in terms of the representation of our thoughts in terms of beliefs, desires, fears, and propositional knowledge. (Several philosophers, for example Stich 1983, have argued that cognition should be understood in terms of propositional attitudes more primitive than beliefs and desires. The suggestion here goes a step beyond this, with the idea that there is a definitely cognitive level of functioning more basic than that of any relations to propositions at all.)

The other radical consequence is that the interpretation of non-factive propositional attitudes is even more uncertain, related in a more indirect way to an even less definite basis of tracking relations. When we say that someone believes that their phone where their backpack used to be, we may be talking about their actual phone, an imaginary phone, the actual or a non-actual backpack, and we may be saying that the one is where the other actually was or some other location linked to it by some devious reasoning. There are many possibilities, and if we want to know what the person is actually thinking we may have to interpret it in terms of the way they track actual information from their actual surroundings.

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