The Assumptions Account of Knowledge Attributions

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Infallibilist skepticism (the view that we know very little of what we normally take ourselves to know because knowledge is infallible) remains a highly influential philosophical position that is perhaps as irksome as it is compelling; for, though it has endured, it is not easy to fully endorse. However, those who have attempted to refute it have continually met with difficulty. In this paper, I elucidate how and why knowledge attributions can be considered true while at the same time acknowledging the lure of infallibilist skepticism. Here, I advance what I will call the *assumptions account* of knowledge attributions.[1] This account is intended to rival a number of other accounts that have surfaced in recent years; most notably, a similar account posited by Gilbert Harman and Brett Sherman.[2]

The Assumptions Account

On this account, whenever a person claims knowledge for himself or attributes knowledge to another in the form, "I know that p," or "She (or he) knows that p," this person is usually, *simpliciter,* stating something false.[3] This is because most propositions admit of some

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[1] It will be important to keep in mind that it is a defining feature of this account that it is *infallibilist*; which is to say that it endorses the view that there cannot be knowledge without certainty. Why? First, though proponents of fallibilism try to soften the dissonant ring of statements like, "I know that p, but I am not certain," and "I know that p, but there is some chance that I could be wrong," such statements sound, at least to my ear, intuitively contradictory. Further, if fallibilism is true, it is not at all obvious why skeptical arguments are compelling. After all, if certainty is not required for knowledge, and we can be wrong about our knowledge claims, but still be said to know them, then why are skeptical arguments thought to pose a problem in the first place? That is, why aren't such arguments quickly dismissed? I suggest that the easiest, and indeed, the correct explanation is that skeptical arguments are compelling because knowledge requires certainty. Others, including David Lewis share this sentiment (see Lewis's "Elusive Knowledge" in the *Australasian Journal of Philosophy, 74:4* (1996)). Skeptical arguments work against fallibilism in other ways as well; though I will not launch into a detailed discussion of this here. My basic presupposition is that I think that we should save infallibilism if we can, and that it would be a point in a theory's favor if it managed to do this. However, it should be pointed out that my account is consistent with fallibilism as well.

[2] Indeed, this account is intended to rival a number of accounts as well (contextualism, subject-sensitive invariantism, and contrastivism); discussing these accounts, however, is beyond the scope of this paper.

[3] Except, perhaps, in cases in which an agent professes to know a certain "necessary truth," (for instance) such as "all bachelors are unmarried," or "2+2=4".

chance of falsehood. As a result, very few, if any, things are known *simpliciter*, for this account is intended to be infallibilist: there is no knowledge without certainty.

The problem with this is it seems that many things *are* indeed known! How is this explained? On this account, though it is held that one may be, *simpliciter,* stating something false when one makes statements of the form, "I know that p," or "He knows that p," one is, at the same time, assuming a number of other propositions. And, a knowledge attribution that contains these assumptions can be implied by our simpler knowledge attributions. Further, a knowledge attribution that contains these assumptions can be true. So, when we attribute knowledge to ourselves or to others, though we, *simpliciter*, speak falsely, it is nonetheless possible for us to imply truths (or at least, what might appear to be truths).[4]

At his point, a few things should be said about the nature of assumptions. First, an agent attributing knowledge does not have to be conscious of a given assumption at the time of the attribution for the assumption to count as been having made or a knowledge attribution containing the assumption to be implied. This is because assumptions need only be held as *dispositional beliefs*. So, an agent can be counted as assuming a proposition p at a time t if the agent *dispositionally believes* p at t. This means that an agent can be plausibly credited with assuming many propositions at once, even if it is implausible that the agent consciously considered each or even any of these propositions as assumptions.

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[4] An example should help to clarify. If I say that, "I know I will not be able to afford a trip to Paris this year," it is plausible that, *simpliciter*, I utter a falsehood. Many things could happen in the upcoming year such that I really *would* be able to afford such a trip: I could have a large inheritance suddenly bequeathed to me; I could win the lottery; trips could suddenly become very cheap; and so forth. So, if knowledge is infallible, it seems that I really do not know that I will not be able to afford the trip! However, when I claim that, "I know I will not be able to afford a trip to Paris this year," I do not claim to know this proposition *simpliciter*. Rather, I claim to know such a thing *given a number of assumptions*. So, when I claim that, "I know I will not be able to afford a trip to Paris this year," what I am plausibly implying is the claim that, "I know I will not be able to afford a trip to Paris this year, *assuming* that I do not have an inheritance suddenly bequeathed to me, I do not win the lottery, trips do not become very cheap, (and so forth)". And this implied knowledge claim is plausibly true.

Additionally, something should be said regarding what exactly the scope of the knowledge operator is on this account. On this account, it is held that when one attributes knowledge, one does not usually attribute knowledge of a proposition *simpliciter*. Rather, one attributes knowledge of a proposition given certain assumptions. These assumptions can be thought of as being conditions. So, when one attributes knowledge of a proposition p in the form, "an agent A knows that p", one can be implying a knowledge attribution of the following proposition: "A knows that (p, given $q_1…q_n$)". Put more formally, when one attributes knowledge in the form Kap, what one is often implying is a knowledge attribution of the form Ka($q_1…q_n$ then p).

It should be stressed at this juncture that the assumptions account of knowledge attributions is primarily an error theory. For, on this account, whenever an agent utters a phrase of the form, "I know that p," that agent is usually saying something that is false, *simpliciter*. The reason that the agent believes that he or she is saying something true is due to the fact that the agent was assuming a number of propositions in addition, which, if stated, might allow one to utter a true knowledge attribution. However, it is granted that it often will likely not be possible to credit agents with assuming a sufficient number of propositions.

Restricting Assumptions

At this point, it might be objected that the assumptions account makes knowledge too easy. After all, there are many conditionals of the form "A knows that if q, then p" that we would not normally count as being knowledge of p *simpliciter*.

On the assumptions account, an agent can be clearly wrong about a knowledge attribution just in case that agent's assumptions are insufficient to guarantee the truth of the attribution. This can happen in one of two ways. The first way is that the agent simply cannot be credited with

having made the assumptions required to render his or her knowledge attribution (infallibly) true. The second way is that at least one of the assumptions required to make the agent's knowledge attribution true is rendered impermissible by one of the following restrictions. That is, some assumptions are impermissible because there are rules that we implicitly follow that govern the assumptions that one is entitled to make. So, though it may be the case that any knowledge claim can be made true if certain assumptions are made, it is not the case that one is allowed to just assume *any* proposition one wishes. In this section, I set out some of the ways in which one can go about attacking the permissibility of a given assumption. I describe four rules that govern whether or not a given assumption is allowed: the rule of epistemic priority, the rule of reasonability, the rule of raised standards, and the rule of truth. These rules are not simply *ad hoc*; rather, they capture certain intuitions regarding which propositions are impermissible to assume and why. It should be stressed that these rules govern when it is in fact *correct or permissible* and when it is *incorrect or impermissible* to attribute knowledge of a proposition p to an agent A (conditional on certain assumptions).

I: Epistemic Priority

The first restriction on assumptions is the rule of *epistemic priority*: in order for a proposition q to be a permissible condition for a proposition p, q must be epistemically prior to p. A proposition q is epistemically prior to a proposition p just in case, if one were to know that p, one could deduce that q and thereby get knowledge that q.

Consider the following statements, "I know that the Earth is spherical, assuming that I am not wrong," and, "I know that the Earth is spherical, assuming that it is not the case that I do not know that fact". It seems that I do not know that the Earth is spherical given either of these assumptions, for the assumptions simply restate what I purport to know.

With this in mind, let us consider the statement, "I know that the Earth is spherical, assuming that the books that I have read which contain this assertion are not all purveyors of erroneous information about the Earth's shape, the Earth has not recently morphed into some other geometrical form unbeknownst to me, memory serves me correctly, (and so on)." Unlike the statements above, I venture that this statement does not have a dissonant ring. Why is this? I suggest that it is at least in part because the assumptions in this case are not mere restatements of the knowledge attribution; rather, they seem to have other content; content that is *epistemically prior* to the proposition that one purports to know.[5]

So, the rule of epistemic priority will restrict all assumptions that simply assert the truth of or deny the falsity of knowledge claims in propositions like, "I know that p assuming that I am not wrong" and, "I know that p assuming that it is not the case that I do not know that p"; for in each of these claims, q is not epistemically prior to p. In these cases, the assumptions are not prior to the propositions conditional on them; rather, they are epistemically on par. As it turns out, however, other kinds of assumptions will also be restricted by this rule. To see this, let us examine another example.

Suppose that a friend and I are attending a luncheon for local singles. We spot a copy of the guest list and decide to take a look. The list is not organized in any way that demarcates the males and the females; it is simply an alphabetically-ordered list of names. My friend and I take a glance at the list, and she says, "I guess I know that Terry is a bachelor." I ask her how she knows such a thing and she says, "Well, assuming that Terry is male, of course". Such an exchange does not seem too odd. However, consider the following exchange: my friend takes a look at the list and says, "I guess I know that Terry is male." I ask her how she knows that, and

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[5] It should perhaps be emphasized that, though adherence to the rule of epistemic priority is part of the reason that the preceding statement seems acceptable, it is, by no means, the entire story. For instance, the next rule, the rule of reasonable belief, plays a role in this as well.

she says, "Well, assuming that Terry is a bachelor". Now this exchange *does* seem odd. And it seems to me that the discrepancy is because of the rule of epistemic priority.

II: Reasonability

The second restriction on assumptions is the rule of *reasonability*. This restriction is in place to disallow assumptions on the grounds that agent has more reason to believe that they are false than the agent has to believe that they are true.

An example should help to clarify why this rule is in place. Say that a very wealthy, miserly, and intensely frugal friend says to me, "I know that I will not be able to afford a trip to Paris this year." When I ask him how he knows that, he says, "Well, I am assuming that I will lose all my money". It seems that a natural reaction would be that of incredulity. My friend does not know that he in fact will not be able to afford the trip because it seems unacceptable for him to assume such a thing. So, in this case, the assumption is unacceptable because there are so many reasons to believe, in the case of this individual, that such an assumption is false, and very few, if any, to believe that they are true![6]

It may be interesting to note that the rule of reasonability permits "neutral" assumptions. That is, the rule permits an agent to assume propositions that the agent has no reason to believe are false, but no reason to believe are true either. One might wonder at this point if these sorts if assumptions should be prohibited. After all, don't we usually require that an agent have at least some reason to believe that her assumptions are true?

The answer to this is that we sometimes do, and we sometimes do not. For instance, it seems intuitively correct that we can assume that we are not brains-in-vats, even though

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[6] Conversely, if the same friend were to say, "I know that I will be able to afford a trip to Paris this year," and, when I ask him how he knows this, he says, "Well, I am assuming that I do not lose all my money, the price of trips does not skyrocket, (and so forth)," this seems permissible. There is no more reason to assume these assumptions are false than there is to assume that they are true. So it seems that my friend does indeed know that he will be able to afford the trip.

arguably, there is no evidence for or against this proposition.[7] However, in other cases, neutral

assumptions plausibly are not permissible. For instance, say that a friend, having recently

become pregnant, tells me, "I know that I will be getting a lot of little girls' clothes soon!" I ask

her how she knows this, and she says, "Well, I am assuming that I have a girl!" It is much too

early for anyone to know the gender of the fetus, and there is no other evidence to suggest that

she will have a girl rather than a boy. Upon hearing this, I would be inclined to say to her, "Now,

now, you don't know that you'll be getting a lot of little girls' clothes soon. After all, you cannot

just assume that you'll have a girl, as you just as easily could have a boy instead."[8]

Why the discrepancy here? I venture that it is at least in part because we have no reason

to think that we are ever going to come upon any evidence that would suggest anything about our

BIV-status (and in fact, we probably have reason to think that we will never come upon any such

evidence). However, we do have reason to think that there is forthcoming evidence that will help

us to determine the gender of my friend's "future child". Thus, it seems fair to say that neutral

assumptions are permissible if we generally think that the prospects for ever finding evidence for

or against them are dim, and not if we think that there are excellent prospects for eventually

finding evidence for or against them.

III: Raised Standards

The third restriction on assumptions results from elevating the standards for knowledge.

Standards plausibly determine which assumptions are permissible in and which are not. It seems

that, if the standards for knowledge are raised high enough, most or all but the strongest

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[7] Likewise, it seems permissible to assume that you are not dreaming, and that there is no demon deceiving you. However, it does not seem permissible to assume that you are a BIV, that you are dreaming, or that there is a demon, which are arguably "neutral" in the sense discussed above as well. However, assuming those things would violate the rule of raised standards discussed in the next section. There are stakes concerns here, for assuming that you are a BIV (for instance) could have potentially ruinous consequences. Further, the possibility that you are not a BIV is arguably a constantly salient one.
[8] I am indebted to Jeremy Fantl for this example.

assumptions are restricted. Thus I will this restriction the rule of *raised standards*. This rule will

have the consequence that, when standards are raised, it is almost impossible to know certain

propositions even given assumptions, because many assumptions will be rendered impermissible

by this rule.[9]

Standards can be commonly raised in one of two ways. The first is by

changing/increasing the stakes; the second, by increasing the salience of certain considerations.

i)   Stakes

Keith DeRose's famous "bank case"[10] provides an excellent example of a scenario in

which stakes seem to affect what can plausibly said be known.[11] Consider a case in which two

friends are waiting in a rather long line at the bank on Friday afternoon. One of them has a

cheque to deposit. It is not at all important that the person deposit the cheque that day, though

she would like to deposit it soon so as to not have a cheque just lying around un-deposited. Her

friend is aware of this, and tells her, "I was just here last week, and out of curiosity, I checked

their hours. I read that they are open on Saturday. So, I know that the bank is open tomorrow.

That means that you can deposit the cheque then, and we can get out of this line."

In this case, what the friend is plausibly implying here is that he knows that the bank is

open tomorrow, assuming that memory serves him correctly, the bank has not changed its hours

in the past week, the bank is not destroyed by tomorrow, the bank is not playing some cruel joke

on its customers, the bank is not closed due to some accident or freak occurrence, and so on.

Since these assumptions seem to be the kinds of things that are plausibly held as dispositional

beliefs, are epistemically prior to the knowledge claim, and are reasonable, the assumptions seem

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[9] This rule bears similarity to David Lewis's "Rule of Attention".

[10] DeRose, Keith. "Contextualism and Knowledge Attributions," *Philosophy and Phenomenological Research*, Vol. 52, No. 4. (Dec., 1992), 913-914

[11] Though I agree with DeRose on this point, I obviously think stakes affect knowledge in a different way than DeRose does.

permissible so far. Thus, the friend's statement that, "I know that the bank is open tomorrow," plausibly implies a true knowledge attribution.

If we change the case, however, such that the individual in possession of the cheque *absolutely requires* that it be deposited no later than Saturday, the assumptions that one is entitled to make change. If enough depends on the cheque being deposited, one would want there to be as little chance of error as possible. Thus it seems plausible that, because of the elevation of potential costs, one is no longer allowed to assume that the bank has not changed its hours. Though there may not be more reason to believe that one's assumptions are false rather than true, there is no reason to believe that they are *sufficiently likely* to be true. In the "low-stakes" scenario it does not seem that there is reason to demand that assumptions be extremely likely to be true, or certainly true, in order to assume them, because nothing important really depends on them being true. However, in the "high-stakes," scenario there does seem to be such reason. High-Stakes cases, in general, seem to require a higher degree of confidence in one's assumptions. They seem to demand that you either have excellent reasons to believe that your assumptions are true or that you are certain that your assumptions are true; to put it another way, you know your assumptions *simpliciter*.[12] But this is very unlikely to be the case for most assumptions. As a result, many assumptions will be restricted in high-stakes scenarios.

ii)   Salience

Standards can also be elevated by raising the salience of certain considerations. If a certain consideration becomes salient, it is no longer permissible to simply assume that it does or does not obtain. An excellent example of a case in which the salience of certain considerations is raised is an epistemology seminar on skepticism. Normally, when one makes everyday

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[12] Which is the case will likely depend on how high the stakes are.

knowledge claims, one is (and is entitled to be) assuming that one is not a BIV. However, when this consideration is made salient in the context of the epistemology classroom, it seems that one is no longer entitled to simply assume that one is not a BIV. Thus it becomes very difficult to know anything even given assumptions in such a situation (since, of course, one can no longer assume the requisite propositions). Indeed, knowledge is difficult in any situation in which certain considerations are made salient and thus it no longer becomes permissible to simply assume them.

IV: Truth

The fourth and final restriction on assumptions is the rule of truth. This rule is in place because false assumptions are impermissible. It is important to note that this rule does not require that one be able to *know* or even be able to identify whether or not one's assumptions are true. The rule simply requires that assumptions must *be* true.[13]

An example should help to clarify why this rule is in place. Consider a variant of the bank case above. As noted, when one friend says that, "I know that the bank is open," what he plausibly implies is "I know that the bank will be open, assuming that memory serves me correctly, the bank has not changed its hours in the past week, the bank is not destroyed by tomorrow, the bank is not playing some cruel joke on its customers, the bank is not closed due to some accident or freak occurrence, (and so on)." Now, say that the two friends decide to return to the bank the next day, and they discover that, as it turns out, the bank is not open, for they *have* changed their hours in the past week. I think that, in the face of this, one might be inclined to say to the other, "Ha! So it looks like you did not really know that the bank would be open! You were wrong." Now, it seems ridiculous to respond to this with, "No, I was not wrong; I said that

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[13] This rule bears similarity to David Lewis's "Rule of Actuality" as described in "Elusive Knowledge" *Australasian Journal of Philosophy, 74:4* (1996), 554

I knew that the bank would be open, but what I was implying was that I was assuming that it had not changed its hours. And the claim that, 'I know that the bank will be open, assuming that it has not changed its hours (amongst other things)' is true whether or not it indeed has changed its hours. So I did know that the bank would be open".

I suspect that this dialogue will strike any reader as being at least somewhat bizarre. Instead, the natural response to the challenge above is, "Yes, I suppose you are right; I guess I did not know that the bank would be open". I suggest that this is because at least one of the requisite assumptions (i.e. that the bank has not changed its hours in the past week) is false, and thus, is not permissible.

Now, what if the bank was indeed open, but as it turns out, it had in fact changed its hours just the other day (thus rendering one of the requisite assumptions false)? We can still imagine one friend checking the bank's hours, advertised as being new, effective as of the day prior, and saying to the other, "Say, how did you know that the bank would be open today if they just changed their hours as of yesterday, and you did not actually go check to see if their hours had changed? I guess you didn't know that the bank would be open today." Again, I venture that it would be ridiculous for the other friend to respond as above: "No, I was not wrong; I said that I knew that the bank would be open, but what I was implying was that I was assuming that it had not changed its hours. And the claim that, 'I know that the bank will be open, assuming that it has not changed its hours (amongst other things)' is true whether or not it indeed has changed its hours. So I did know that the bank would be open". Rather, the natural response is, again, "Yes, I suppose that I did not know after all".

Rival Accounts

There is one account of knowledge attributions in particular that I will discuss in this section that the assumptions account is intended to rival. This account bears some resemblance to the assumptions account, but is importantly different, and is posited by Gilbert Harman and Brett Sherman in their article, "Knowledge, Assumptions, Lotteries".[14] In this section, I briefly explain how this account differs from the assumptions account and argue that the assumptions account has an advantage in that one need not deny strong closure principles if one is to accept it.

II. Harman and Sherman's Account

In, "Knowledge, Assumptions, Lotteries," Harman and Sherman note that they endorse two theses about knowledge, one of which is the following thesis, which they term, "T1":

T1: What one knows can and usually does rest on assumptions one justifiably takes for granted without knowing them to be true.[15]

Harman and Sherman note that T1 seems highly intuitive to them, and provide an example similar to the examples outlined in the first part of this paper. They ask the reader to consider the case of an ordinary individual that they call Sam, an individual who knows that he owns a car that is presently parked outside in front of his house. As Harman and Sherman put it, Sam's knowledge rests on various assumptions that he does not know but justifiably takes for granted: that there is an external world including cars and houses, that he is not a brain in a vat

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[14] Harman, G. and Sherman, B. "Knowledge, Assumptions, Lotteries" *Philosophical Issues 14:1*, 492-500 (2004). There is one other account that bears some similarity that I will not discuss here: an account called *contrastivism*, which is outlined in by Jonathan Schaffer his paper, "From Contextualism to Contrastivism", *Philosophical Studies*, *119:1-2* (2004), 73-103. My account is importantly different contrastivism because, according to Schaffer, knowledge attributions express ternary relations between a subject, a proposition, and a comparison class (which is admittedly, sometimes "hidden"). On my account, knowledge-attributions express binary relations. I think that we should save the binary interpretation of knowledge-attributions if at all possible, given that it is far from clear that "know" really denotes a ternary relation.

[15] Harman, G. and Sherman, B. "Knowledge, Assumptions, Lotteries" *Philosophical Issues 14:1* (2004), 492

who simply imagines that he has a car and a house, and that no one has taken his car away since he parked it in front of his house an hour ago.[16]

Thus far, Harman and Sherman's account seems to be very similar to the assumptions account. However, this is where the similarities end. For, as Harman and Sherman note, though part of the explanation of Sam's knowing that his car is presently parked outside in front of his house is that he justifiably (and truly) takes it for granted that the car hasn't been stolen, the truth value of the knowledge attribution is not relative to the things that Sam "takes for granted". That is, the claim that, "Sam knows his car is parked outside," is not elliptical for something more complex.

Further, Harman and Sherman note that, on their view, knowledge that p which rests on justifiably taking it for granted that q is not just knowledge that, if q then p. This is presumably because they think that this would make knowledge too easy. They write, "Sam knows that if he is not a brain in a vat, he is not a brain in a vat. But he is not justified in coming to believe that he is not a brain in a vat and he cannot come to know that he is not a brain in a vat just because he is taking that for granted"[17].

As hinted at above, the principal difficulty with Harman and Sherman's account is that, in order for it to be tenable, they must deny strong closure principles.[18] Harman and Sherman need to deny strong closure because one would be able to derive knowledge of the propositions that he or she is only entitled to assume if strong closure principles were true. For instance, Sam knows that his car is parked outside (assuming that it hasn't been stolen). However, Sam should also

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[16] Ibid., 493
[17] Ibid., 493
[18] One such principle states that, if an agent A knows that p, and if A knows that if p then q, then A knows that q. This is a very basic characterization of a strong closure principle, and it only works provided that A actually makes the correct inference from p to q and comes to believe q as a result. Thus, to really get the principle exactly right, this principle likely needs a bit of reformulation.

know that if his car is parked outside, then it has not been stolen. Thus, if strong closure principles are true, Sam also must be able to know that his car has not been stolen. However, it does not seem right that one should be able to come to know a proposition merely by assuming it; thus, Harman and Sherman must deny strong closure.

In contrast to a defender of Harman and Sherman's account, a proponent of the assumptions account need not deny strong closure principles. Why not? A proponent of the assumptions account can explain why one cannot derive knowledge of one's assumptions (simply by assuming them) another way: by referencing the rule of epistemic priority. Again, this rule states that in order for an agent to be allowed to assume a proposition q as a condition for a proposition p, q must be epistemically prior to p. A proposition q is epistemically prior to a proposition p just in case, if one were to know that p, one could deduce that q and thereby get knowledge that q. So, though Sam can know that his car is parked outside given that it has not been stolen, he cannot know that his car has not been stolen simply by assuming that it has not, as these two propositions are clearly epistemically on par.

One might still worry that a proponent of the assumptions account must deny strong closure. After all, on this account, Sam does in fact know that his car is parked outside given that it has not been stolen, and Sam arguably also knows that if his car is parked outside, then it has not been stolen. So, if strong closure principles are true, Sam should be able to derive knowledge that his car has not been stolen.

To see why this is not a problem for the assumptions account, recall that, on the assumptions account, a proposition p is rarely known *simpliciter*. Thus, even if one knows that if p then q (*simpliciter*), since one will likely not know p *simpliciter*, one will not be able to derive knowledge of q *simpliciter*. Let us return to the example of Sam and his car. On the assumptions

account, Sam knows that "his car is parked outside, given that it has not been stolen". He also knows that if his car is parked outside, then it has not been stolen. However, he does not know that his car is parked outside *simpliciter*. He only knows that, "if his car has not been stolen (among other things), then it is parked outside". And, it is not generally the case that ((if q then p) then q). That is, it does not follow from the fact that Sam knows that "if his car has not been stolen (among other things) then it is parked outside" that "his car has not been stolen". Thus, he cannot make the inference from knowing that, "his car is parked outside given that his car has not been stolen" to knowing that, "his car has not been stolen".

It is worth noting that Harman and Sherman present several arguments designed to show that the rejection of strong closure principles is not a loss. However, given that such principles are highly intuitive, any theory that would be able to accommodate them would arguably be preferable to one that does not. And, the assumptions account that I have sketched above manages to accommodate the insight that knowledge attributions often depend on assumptions without having to reject strong closure principles as a result.

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