

THE COGNITIVE IMPORTANCE OF TESTIMONY

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Abstract. As a belief source, testimony has long been held by theorists of the mind to play a deeply important role in human cognition. It is unclear, however, just why testimony has been afforded such cognitive importance. We distinguish three suggestions on the matter: the *number claim*, which takes testimony's cognitive importance to be a function of the number of beliefs it typically yields, relative to other belief sources; the *reliability claim*, which ties the importance of testimony to its relative truth-conduciveness; and the *scope claim*, according to which testimony's importance is a function of its relative representational power, non-numerically conceived. After laying out these three suggestions, we go on to argue that there is little hope of grounding testimony's cognitive importance in either the number claim or the reliability claim. We conclude with a tentative exploration of the basis and plausibility of the scope claim.

Keywords: Belief; epistemology; inference; testimony.

1. The perceived importance of testimony throughout history

One way of typing beliefs is according to the source from which they derive. A belief source is a cognitive process that takes certain characteristic states as inputs and yields corresponding beliefs as outputs. Thus we may speak of vision as a belief source that takes visual experiences as inputs and yields visual beliefs as outputs, inference as taking existing beliefs as inputs and yielding new, inferred beliefs as outputs, and so on. Our concern in this paper is with testimony, a belief source that takes receptions of other people's reports (i.e., of other people's expressions of belief)¹ by way of inputs and yields testimonial beliefs about the representational contents of those reports as outputs.

Testimony, in this broad sense, has long been held by theorists of the mind to play a deeply important role in human cognition. Despite their differences on the epistemological question of how testimonial beliefs convert into knowledge, for example, the Scottish Enlightenment philosophers Thomas Reid and David Hume were agreed about the cognitive prominence of the source from which such beliefs derive. Reid stressed that we "receive the greatest and most important part of our knowledge by the information of others," ([1764], p. 193) and was puzzled as to why other theorists had "laboured so anxiously to analyse our solitary operations [of the mind],

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and given so little attention to the social.” (Reid [1785], p. 36) In a similar vein, Hume admitted that “there is no species of reasoning more common, more useful, and even necessary to human life, than that which is derived from the testimony of men, and the reports of eyewitnesses and spectators.” ([1777], p. 111)

This view about the cognitive importance of testimony is widely echoed on the contemporary epistemological scene. Consider the following sampling:

I find myself believing all sorts of things for which I do not possess [first-hand] evidence: that smoking cigarettes causes lung cancer, that my car keeps stalling because the carburetor needs to be rebuilt, that mass media threaten democracy, that slums cause emotional disorders, that my irregular heartbeat is premature ventricular contraction, that students’ grades are not correlated with success in the non-academic world, that nuclear power plants are not safe (enough) . . . The list of things I believe, though I have no evidence for the truth of them, is, if not infinite, virtually endless.

[. . .] If I am correct, appeals to epistemic authority are essentially ingredient in much of our knowledge. (Hardwig 1985, p. 335–6)

We acquire many of our beliefs from others, often on the basis of their say-so alone. When a stranger introduces himself, we seldom demand to see his *bona fides*. We take it that he knows his own name and is honest in reporting it. When a lecturer declares that Beethoven never heard his ninth symphony, or that the Greeks discovered irrational numbers, or that gold dissolves in aqua regia, his students dutifully record these nuggets in their notebooks and parrot them back on exams. Rarely are they pesky enough to ask for evidence. Our cognitive range would be sorely restricted if we couldn’t glean information from one another. (Elgin 2002, p. 291)

[T]estimony is both globally and focally essential in our lives: we depend on it in an overall way for an adequate view of the world, and we rely on specific attestations for knowledge or justification regarding specific propositions. Testimony is indeed of virtually unlimited breadth in its epistemic power: nearly everything that can be known firsthand can also be known on the basis of testimony. (Audi 2004, p. 31)

Our dependence on testimony is as deep as it is ubiquitous. We rely on the reports of others for our beliefs about the food we eat, the medicine we ingest, the products we buy, the geography of the world, discoveries in science, historical information, and many other areas that play crucial roles in both our practical and our intellectual lives. Even many of our most important beliefs were learned at an earlier time from our parents and caretakers, such as the date of our birth, the identity of our parents, our ethnic backgrounds, and so on. Were we to refrain from accepting the testimony of others, our lives would be impoverished in startling and debilitating ways. (Lackey 2006, p. 1)

As such quotations illustrate, there is an ambiguity about why it is that testimony is thought to be so important for human cognition. Here we want to distinguish three possible suggestions on that matter, one pertaining to the quantity, the other two to the quality, of testimony's overall output relative to that of other belief sources. According to the *number claim*, as we'll call the first suggestion, testimony is important for human cognition because human cognitive agents typically acquire at least as many (if not more) beliefs from testimony as from any other distinct source. According to what we'll call the *reliability claim*, the importance of testimony lies not in the relative number of its outputs but in the relative strength of its contribution to a central goal of human cognition. Undoubtedly, human cognitive goals come in a wide variety, such as solving puzzles, answering questions, increasing the coherence of our views, generating explanations, and so on. But many of these goals seem centrally tied to the overarching cognitive goal of truth, i.e. representational accuracy, or achieving a high truth-to-falsity ratio among our beliefs (Goldman 1986, Ch. 5; 1999, Ch. 1–3). Where truth in this sense is understood as one overarching cognitive goal in human cognition, it might be thought that testimony's cognitive importance derives from its playing at least as big a role as other any other belief source in the attainment of truth. This is equivalent to the idea that testimony is important for human cognition because it is at least as reliable as any other belief source, such as vision or inference.

A third suggestion, which we'll call the *scope claim*, has it that testimony is important because it typically plays at least as prominent a role as other sources in attaining a distinct, but arguably equally important goal of human cognition, viz. having an overall representation of the world that is broad in scope. The idea is that testimony, as least as much as (if not more than) any other belief source, affords us the ability to represent significantly more of the world than we would be able to in its absence.

Though we agree that testimony plays a deeply important role in human cognition, we think there is little hope of grounding its importance in either the number claim or the reliability claim. Cognitive scientists, epistemologists, and other theorists of the mind would be best advised in our view to look rather to the scope claim to understand testimony's cognitive importance. The primary burden of this paper is to explain why we think this. In the next section, we'll present our reasons for rejecting the number claim, before going on in Section III to articulate our skepticism about the reliability claim. We'll then turn in Section IV to a tentative exploration of the scope claim and its plausibility.

2. The number claim

To begin the case against the number claim, consider the distinction that is sometimes drawn between dispositional and occurrent beliefs. Dispositional beliefs involve dispositions to assent to the truth of propositions, whereas occurrent beliefs are taken to be acts of assent themselves. When asked, or prompted to consider whether the population of the United States exceeds 300 million, Jones may be said to form the occurrent belief that the population does exceed this amount, by assenting (perhaps non-verbally) to the truth of that proposition. Later, soundly asleep in her bed, it may still be appropriate to attribute to Jones the belief that the US population exceeds 300 million—even though she is not then assenting to the truth of anything—because she retains the disposition to assent to the truth of the proposition that the US population exceeds 300 million; she retains the dispositional belief, that is, despite no longer having the occurrent belief. Audi (1994) captures the distinction this way:

What is dispositionally as opposed to occurrently believed is analogous to what is in a computer's memory but not on its screen: the former need only to be brought to the screen by scrolling—a simple retrieval process—in order to be used, whereas the latter is before one's eyes. Compare a dispositionally believed proposition's needing to be "called in," as in answering a request to be reminded of what one said last week, with an occurrently believed proposition's being focally in mind, roughly in the sense that one attends to it, as where one has just formulated it to offer as one's thesis (p. 420).²

Our discussion of the number claim will focus on beliefs in the dispositional sense, leaving aside any reading of that claim that pertains to so-called occurrent beliefs. It seems obvious, even if one grants the distinction between occurrent and dispositional beliefs, that the vast majority of beliefs held by human cognitive agents are dispositional. And it's far from clear that the distinction really is a distinction between two different types of belief. As propositional attitudes, beliefs are, we take it, stored representational states of agents, and what are called occurrent beliefs are not really stored states at all, but rather actions or processes. It's probably more useful and coherent, then, to treat so-called occurrent beliefs as *activations* or *retrievals* of belief—judgments—as contrasted with beliefs themselves. At any rate, it would seem that the number claim carries the most interest as a claim about the relative number of beliefs that human cognitive agents acquire over time, which would make it about dispositional beliefs, since occurrent beliefs or judgments are had or made only for brief moments.

Beliefs in the relevant sense will thus amount to the basic elements of declarative (as contrasted with procedural) memory in the preservative sense.³ Accordingly, the question of whether human cognitive agents typically have at least as many beliefs

derived from testimony as from any other belief source may be understood as a question about the relative number of testimonial as contrasted with other (e.g., visual) memories typically stored in declarative memory by human cognitive agents.

Declarative memory is widely recognized as consisting of episodic and semantic subsystems (Tulving 1983; 1993; 2002). Although these distinct subsystems have been distinguished in various ways, one central aspect of difference concerns the sorts of declarative memories they respectively store. Episodic memories characteristically involve beliefs whose contents are experientially-laden in a special way (e.g., beliefs whose contents contain as constituents the very sorts of experiences that have in the past served as inputs to perceptual belief sources). As Tulving (1983) puts it, episodic memory “is capable of recording and retaining information about perceptible properties of stimuli that can be apprehended immediately by the senses.” (p. 41) Semantic memories, by contrast, are beliefs whose contents are merely “factual” in nature; their contents contain no past perceptual experiences as constituents.⁴ Thus, for example, beliefs with such contents as the following (where underscoring represents experiential constituents in the italicized contents) would count as episodic memories: *it looked like this when I saw the car run the red light at the intersection of Main and First streets yesterday morning, it felt thus when my husband kissed me on our anniversary last year at our favorite bistro, the instructor sounded this way in Monday’s lecture*. And beliefs with contents like the following would amount to semantic memories, in that they can be represented without any experiential content: *the car ran the red light at the intersection of Main and First streets yesterday morning, my husband kissed me on our anniversary last year at our favorite bistro, the instructor gave a lecture on Monday*.

With this background in mind, it seems clear that testimony, unlike perceptual belief sources, does not yield the right sort of experientially-laden beliefs by way of its outputs to count as contributing to episodic memory. The reports of others, receptions of which serve as the inputs to testimony, never contain the recipient’s *own experiences* as constituents of their contents; hence the outputs of testimony—beliefs in the contents of those reports—are simply not the sorts of beliefs that appear in episodic memory. Testimony doesn’t yield at least as many beliefs *qua* stored elements of episodic memory as any other belief source because it doesn’t yield beliefs *qua* stored elements of episodic memory at all. So whatever testimony’s contribution to the number of beliefs in human cognitive agents, it will fall on the semantic side of declarative memory.

One might suggest that, despite yielding only semantic memories as its outputs, testimony typically yields at least as many of those in human cognitive agents as any other belief source yields declarative memories (of either the episodic or semantic sort). But this suggestion, we think, has very little plausibility in the light of the following considerations. Consider first that testimonial beliefs are always acquired

perceptually, but the reverse is not true. That is, testimony cannot be engaged without engaging perceptual sources, whereas they obviously can be engaged without engaging testimony. When a teacher tells you that mercury is bad for you, and you accept her testimony by forming the belief that mercury is bad for you, you not only store that testimonial belief in semantic memory, you also store perceptual beliefs corresponding to experiential aspects of that testimonial event, such as beliefs about the sound of the teacher's verbal utterance itself, its duration, her appearance in uttering it, the noise-level and salient colors of the classroom in which she spoke, etc. It follows that for every testimonial belief stored in semantic memory, i.e. for every testimonially-derived semantic memory, there will be at least some perceptual beliefs stored in episodic memory.

There is, to be sure, a division of cognitive labor among the perceptual sources involved in testimony's operation. From the fact that for every testimonial belief stored in semantic memory there are at least some perceptual beliefs stored, it doesn't strictly follow that for every testimonial belief stored there are at least some visual (say) beliefs stored; it only follows strictly that for every testimonial belief stored there are at least some perceptual beliefs stored, *either* visual *or* auditory *or* tactile, etc. But it's eminently plausible that for most human cognitive agents, certain perceptual sources are almost always involved in the operation of testimony. For sighted, hearing humans, for example, it seems that the vast majority of occasions on which testimony is operative are ones on which vision and audition are operative; hence for sighted, hearing humans, it will typically be the case that for every testimonial belief stored there are at least some visual beliefs stored or some auditory beliefs stored. For non-sighted, non-hearing humans, it will presumably be the case that for every testimonial belief stored there are at least some tactile beliefs stored.

It is also important to bear in mind that the more continuous operation of perceptual sources means that there will be many occasions throughout the lives of human cognitive agents during which perceptual sources yield beliefs but testimony does not. For sighted humans, for example, vision is always operative, except for those relatively rare occasions on which the visual apparatus is effectively put in neutral—usually by sleeping. (Even when shutting one's eyes or looking in darkness, we are storing perceptual beliefs that we are seeing nothing.) The engagement of testimony is comparatively infrequent—for the most part, only when someone is speaking to you or when you are observing media such as books or television.

Moreover the inputs to perceptual sources are in general considerably more numerous than the inputs to testimony, which strongly suggests that the perceptual sources generate more episodic memories on any given occasion of their engagement than testimony generates semantic memories on any given occasion of its engagement. Consider the inputs to vision—visual experiences (or information-bearing stimulations of the visual organs). It's difficult to estimate an upper bound for the

number of such experiences required for each visual episode, but a robotics team has recently found that their robots needed to store between 100 and 1,000 encoded descriptions per episode engaged (Laird & Derbinsky, 2009). If the existence of such a description in a scene correlates with a visual experience, the typical inputs to vision per episode engaged would number into the tens and possibly hundreds.

Granted, there won't be an episodic memory stored as output for each such experiential input: our minds do a great deal of compression in episodic memory. If we see a bowl of cherries, for example, we won't store an episodic memory corresponding to each of our visual experiences of each of the cherries; we'll rather store an episodic memory corresponding to our experience of the texture of cherries, the roughly-estimated quantity of cherries, etc. And it's possible that the mind relieves its episodic memory burden over time by storing only new episodic memories that correspond to non-redundant information about perceptual changes. The next time we turn our eyes toward the cherries, we probably won't store numerically distinct, but content-equivalent episodic memories about the texture of the cherries and so forth.

Still, it's a lot of inputs per episode engaged by a perceptual source like vision that we're talking about—and thus a fair amount of visual episodic memories stored as outputs per episode engaged (even if few in number relative to the number of inputs)—when you contrast it with the number of inputs to testimony per occasion of its engagement, which will typically be one or slightly more. Most receptions of other people's reports, we take it, consist of receptions of one or two expressions of beliefs; long conversations, books, etc., would seem best thought of as containing series of distinct testimonial engagements.

Judged by the amount of inputs per occasion of engagement, then, it would seem that a perceptual source like vision typically generates considerably more declarative memories than testimony. Put this observation together with those canvassed above—that perceptual sources operate in a more continuous fashion, that testimonial beliefs are always acquired perceptually but not vice-versa, and that testimony is itself incapable of contributing to episodic memory—and the plausibility of the number claim becomes vanishingly small.

Notwithstanding, one might think that a narrower version of the number claim has something to be said for it. Our argument to this point has sought to undermine the number claim in the relevant sense articulated at the beginning of this section, viz. that testimony typically yields at least as many declarative memories in human cognitive agents as any other belief source. But, even if it is successful, the argument does not rule out what we might call the *semantic number claim*, viz. that testimony typically yields at least as many *semantic* memories in human cognitive agents as any other belief source.

The significance of the semantic number claim in the present context is unclear. One might reasonably think that, regardless of its truth, it holds little hope of illumi-

nating the basis for the *general* cognitive importance of testimony expressed in the opening section of our paper precisely because of its narrowness. Be that as it may, however, we're dubious of even of the semantic number claim's truth. Leaving aside controversial nativist views,⁵ it would seem that the main competitor for testimony when it comes to the generation of semantic memories is inference.⁶ Our various perceptual belief sources, such as vision and audition, are plausibly understood as yielding in the first instance episodic memories; their contribution to semantic memory is through some kind of process of abstraction or generalization. But such a process is pretty clearly inferential in nature, which means that the primary source for semantic memories in the human cognitive system, outside of testimony, is inference.

The question of the semantic number claim, then, amounts to the question of whether testimony typically yields at least as many semantic memories for human cognitive agents as inference. And the prospects of a positive answer to the question, so understood, seem rather dim, for at least two reasons. First, inference would seem to be constantly operative in extracting semantic memories from the episodic outputs of perceptual sources. The engagement of testimony to generate new semantic memories is by comparison infrequent. Second, inference also gives us many semantic memories based on the semantic deliverances of testimony itself. It is the norm, rather than the exception, to infer various further beliefs upon the acquisition of a testimonial belief: when someone tells you that Xanthippe was a woman, and you accept it, you will typically—if almost instantaneously and subconsciously—infer various further beliefs, such as that Xanthippe was mortal, that she had certain nutritional needs, etc. Both antecedently and consequentially, then, inference would seem typically to yield considerably more semantic memories than testimony.

3. The reliability claim

So much, then, for the number claim. But what about the reliability claim? Might it be understood as illuminating the basis for the importance of testimony in human cognition? On the face of things, the available empirical evidence is not encouraging when it comes to claims about the relative truth-conduciveness of testimony. From the 1970s onward a great deal of psychological research has been directed at the supposed reliability of testimony—particularly of the sort one finds in legal proceedings, such as adult eyewitness testimony offered as evidence in criminal trials. (See Wells & Loftus (1984) and Ross et al. (1994) for two prominent collections.) Early contributions to this research, largely inspired by a reaction to misleading “tape recorder” analogies for testimony, drew attention to various ways in which the accuracy of testimonial deliverances is demonstrably undermined. In a *locus classicus*, for example, Buckhout (1974) noted a clinical propensity of individuals to testify inac-

curately about matters on which their initial beliefs could only have been acquired in poor observational circumstances or under the distorting effects of excessively high and low arousal levels (stress and insignificance), about matters in the too-distant past, in situations involving the leading expectations and promptings of audiences or testers (bias) and the awareness of a conflict between the individuals' own initial opinion and that of a majority of others about the matter at hand (conformity).

These early contributions to the psychology of testimony were often summarized by such sweeping claims as “[e]yewitness testimony is unreliable” and “[n]umerous experiments show [...] that it is remarkably subject to error” (Buckhout 1974, p. 23), and they have been strongly criticized for precisely that reason. In addition to stressing how the active nature of testimonial belief acquisition can in some circumstances lead to accurate views that could not have been arrived at by any merely passive recording process (Coady 1994, p. 268), Coady points out that the move from testimony's unreliability under certain narrow conditions to its general unreliability amounts to an unwarranted generalization:

The testimony we confront in everyday life covers a vast range of subject-matter, situation, and context, and it invokes a variety of different skills and tasks. The same is true of the lawcourts. For understandable reasons, there is a strong tendency in the psychological work to use the term ‘eyewitness testimony’ principally for evidence of suspect identification and also, though with less emphasis, certain associated matters such as the identification of what we might call ‘suspect events’ or ‘suspect intervals’. So there has been quite a lot of work on witnesses’ estimates of how long a time a dramatic crime-like event took. But witnesses give vast amounts of information to courts other than this sort of thing—important as it can be. People tell us, surely with a high degree of reliability though not with infallibility, who they are, what work they do, where they live, how old they are, details of their familiar environment, their spouses’ and children’s names, ages, occupations, and similarly for their close friends and colleagues (much of this, of course, being hearsay but none the less valuable for that). They also *identify* familiar acquaintances, friends, colleagues, lovers, spouses, offspring, and old enemies with remarkable accuracy. This accuracy is still pretty remarkable about their personal belongings. All of these areas can provide vital information in daily life and in the course of a trial, yet my reading uncovered no reference to such competencies. I speculate that we rightly place very substantial reliance upon such testimony. (Coady 1994, p. 269–70)

Even so, it's important to note that criticisms like Coady's are largely defensive in nature: that the psychological research to date has at best only pointed to a fallibility in testimony shared by other belief sources (as limited cognizers, none of our belief sources is infallible), or only to a significant degree of unreliability in testimony under certain special circumstances, provides no support for a general claim on the

other side to the effect that testimony is at least as reliable as other sources. So when it comes to empirical findings, we think, it's fair to conclude at the very least that the reliability claim has nothing substantial in its favor.

But we also think that there's more to be gleaned from reflection on the empirical findings about the reliability of testimony than just such a stand-off. There's a good reason why the psychological research in question has often been described as concerning the reliability of testimony, despite the fact that much of it involves considerations about the (often infelicitous) perceptual and retrieval conditions involved in the testimonial process: testimony—even in its sincere form⁷—requires more than one level of active, interpretive “filtering” than certain other belief sources, and as such carries a greater potential for unreliability than these other sources; and the considerations about the perceptual and retrieval conditions involved in the testimonial process highlight this fact.

To draw out this point more fully, let's first distinguish between basic and non-basic belief sources.⁸ A basic belief source is a belief source that generates beliefs from something other than beliefs; that is, it is a belief source that characteristically takes something other than beliefs by way of inputs, to yield beliefs as outputs. A non-basic belief source, by contrast, is one that generates beliefs from other beliefs, i.e., a source that typically takes beliefs as part of its input, yielding further beliefs by way of its output. Thus, for example, vision counts as a basic belief source, because it characteristically generates beliefs about the environment based on visual experiences of the environment as its inputs. Inference, on the other hand, counts as a non-basic belief source because its characteristic inputs include beliefs.

It is a widely acknowledged point in cognitive psychology that all belief sources, including basic ones so understood, involve some level of active, interpretive filtering. This is just part and parcel of the acknowledged truth that none of our belief sources operates as a simple recorder mechanism, and it fits with our earlier observation about the compression of belief-storage in declarative memory. When it comes to a basic perceptual source like vision, for example, there is a distinction to be drawn between three potential levels of such filtering: one at the initial acquisition or storage stage, one at the retention stage, and one at the retrieval stage. Thus, as Elizabeth Loftus puts it:

When we experience an important event, we do not simply record that event in memory as a videotape recorder would. The situation is much more complex. Nearly all of the theoretical analyses of the process divide it into three stages.[...] First, there is the *acquisition* stage—the perception of the original event—in which information is encoded, laid down, or entered into a person's memory system. Second, there is the *retention* stage, the period of time that passes between the event and the eventual recollection of a particular piece of information. Third, there is the *retrieval* stage during which

a person recalls stored information. This three-stage analysis is so central to the concept of the human memory that it is virtually universally accepted among psychologists. ([1979], p. 21)

Since one can acquire or store perceptual beliefs without then going on either to retain them (in long-term, preservative memory) or to retrieve them (via recollective memory), the only level of interpretive filtering that is strictly required by a basic perceptual source is that of the acquisition stage; but it is important to realize that even there some such filtering is required. Loftus continues:

When a complex event is experienced, some of the features of that experience are extracted first to be stored and later to be utilized in arriving at action decisions. Early on, in the acquisition stage, the observer must decide to which aspects of the visual stimulus he should attend. Our visual environment typically contains a vast amount of information, and the proportion of information that is actually perceived is very small. The process of deciding what to attend to is broken down into an even finer series of decisions, each corresponding to where a person will make his next eye fixation. ([1979], p. 21)

So even with a basic source such as vision, the generation of outputs from inputs involves a kind of active processing of the data given in the inputs, so as to select and attend to some aspects of the data, for certain purposes, in the light of the individual's background commitments and other beliefs, attitudes, desires, and emotions. Effectively, the filtering process is one in which meaning is imposed on the input data to transform them into stored beliefs or memories.

There are significant practical advantages to the imposition of an interpretative filter—without it the data of inputs would fail to be transformed into useful (or at any rate as useful) information (useful, say, for longer-term successful prediction and manipulation of the environment in characteristically human ways)—but it comes at some cost of reliability: the very imposition of the filter renders the associated belief sources less than perfect copying mechanisms, and the resulting output beliefs, partly in virtue of the increased usefulness/meaningfulness they acquire through the interpretative process, fall short of a perfect “mirroring” of the content of the input data and of the elements of the world they in turn represent.

But now consider non-basic belief sources like inference. As non-basic sources, they necessarily involve more levels of active, interpretive filtering than the basic sources on which they depend: for they, unlike those basic sources, require by way of their input previous beliefs that have been acquired, retained, and retrieved. If, as the psychological research suggests, active filtering is required at each of these levels of processing, and if each of these levels of processing is required in turn for non-basic sources even to begin to operate, it follows that non-basic sources necessarily require

more levels of filtering than basic ones. If one infers something based on a previously acquired perceptual belief, filtering occurs not just in the previous processes involved in acquiring the perceptual belief, but also in the processes involved in retaining and then retrieving it for the subsequent inferential process.

There is, moreover, another level of interpretive filtering required by non-basic sources: not only do they require the filtering involved in the initial acquisition of the beliefs that form part of their input, and the filtering involved in these beliefs' retention and retrieval, they also require some level of filtering in the transition from those beliefs as part of their input to the further beliefs generated as their output. When one infers something based on a previously acquired perceptual belief, filtering occurs not just in the previous processes involved in acquiring the belief, not just in the processes involved in retaining and retrieving it, but also in the processes involved in the inference itself.

The general point, then, is that non-basic belief sources involve by their very nature more levels of active, interpretive filtering than basic belief sources. This helps explain why the non-basic sources may be especially useful in and characteristic of distinctly human cognition; but it also has the result that the non-basic sources are by their very nature less reliable than basic ones, because with the advantages of usefulness and meaning carried by the additional levels of filtering come diminishments of reliability.

But note now that testimony is a non-basic belief source in the relevant sense. To see this, compare the following sketches of vision (Table 1) and testimony (Table 2):

Table 1

<i>Input</i>	<i>Vision</i>	<i>Output</i>
Visual experiences, e.g., its seeming visually that there is a red car in yonder parking lot	Processing of visual experiences	Visual beliefs, e.g., believing that (it seemed visually that) there is a red car in yonder parking lot

Table 2

<i>Input</i>	<i>Testimony</i>	<i>Output</i>
Receptions of others' reports, e.g., hearing another assert that traffic is barely moving on Main Street	Processing of receptions of others' reports	Testimonial beliefs, e.g., believing that traffic is barely moving on Main Street

Unlike what's described in the input column of Table 1, what's described in the input column of Table 2 must include beliefs. For receptions of others' reports inevitably include perceptual beliefs about (at least) the physical encodings of the reports—hearing the verbal utterances of the testifier, for example—as well as whatever beliefs are wrapped up in understanding the communicative meaning of those items.⁹

This means that testimony is quite unlikely to count as at least as reliable as certain other human belief sources. For testimony, as a non-basic belief source (like inference¹⁰), is bound to include more levels of active, interpretive filtering than such basic sources as vision, with the result that its reliability relative to them isn't likely to be as great. That's not to say, we want to stress, that testimony is altogether unreliable, or even too unreliable to be worthy of use by cognitive agents especially interested in representational accuracy or truth: a less reliable source can still be reliable enough for all that, and on this point we fully agree with testimony's defenders like Coady. But it is to say that the reliability claim is, in our view, no more plausible than the number claim.

4. The scope claim

Testimony, we agree, is deeply important for human cognition. But, as we have tried to show, it is unlikely that we can ground testimony's cognitive importance in anything like the number claim or the reliability claim. Let's now turn to the third suggestion gestured at in Section I, viz. the scope claim. Recall how we captured it: testimony, as least as much as (if not more than) any other belief source, affords us the ability to represent significantly more of the world than we would be able to in its absence.

How does the scope claim differ from the number claim? Both, in a way, point to the representational power of testimony relative to other human belief sources. But whereas the number claim treats the relative representational power of testimony as a function of the number of beliefs or declarative memories it typically generates in humans, the scope claim treats testimony's relative representational power as a function of something else.

To begin to see what this "something else" might be, consider a non-numeric account of what is for one individual to *know more* than another, explored by Treanor (2012).¹¹ One individual's having more knowledge than another, on this account, is understood not in terms of the relative number of distinct bits of knowledge that each possesses (e.g., distinct beliefs that are both true and justified in an epistemically appropriate way), but rather in terms of the relative size of each individual's epistemic space: one subject knows more than another just in case her epistemic space is smaller than the other's epistemic space.

To say that one individual's epistemic space is smaller than another's is to say that the most remote epistemic world for the first individual is closer than the most remote epistemic world for the second, where an epistemic world for a subject is a possible world that is consistent with what she knows, and where the subject's most remote epistemic world is the one furthest away from (i.e. most dissimilar to) the actual world. To illustrate, Treanor (2012) writes:

[I]magine two world-mates who share a belief system at a time, at least to the degree that this is possible given that they are two believers rather than one (ignore *de se* beliefs, various other indexicals, etc.), and who have identical justification or warrant for what they believe. They plausibly know the same amount, and on the account above the amount they each know is given by the distance between the actual world and their furthest away epistemic world. Suppose further that neither subject has any belief one way or the other concerning whether the number of threads in my shirt is even, and no belief one way or the other concerning whether there are electrons. Now, add to the first believer a true, justified belief that the number of threads in my shirt is even. Prior to adding this belief, the subject's furthest away epistemic world was one in which the number of threads in my shirt is odd. That is because it is further away than a possible world that is identical except for the fact that the number of threads in my shirt is even. With the belief concerning the number of threads in my shirt being even added, therefore, the subject's furthest away epistemic world jumps a little closer. Not much closer, but closer nonetheless. But now imagine adding to the other subject a justified belief that that there are electrons. That subject's furthest away epistemic world jumps significantly closer to the actual world, since a world in which there are no electrons is much further away from the actual world than a world in which there are electrons, holding everything else as much as possible the same. In other words, whether or not there are electrons is a big difference, whereas whether the number of threads in my shirt is even or odd is a little difference. (p. 19)

A similar, more general account could be given about the relative representational power of distinct belief sets, setting aside particular issues about knowledge and subjects, which are less to our present purpose. Thus, we can talk of representational space as consisting of the ways in which the world might be represented (i.e. "representable possible worlds," or just "representable worlds" for short), and we can say that one belief set takes up more representational space—occupies more volume in representational space—than another just in case the representable world that is furthest away from (i.e. most dissimilar to) the actual world given (i.e. consistently with) the first set is nonetheless closer to the actual world than the representable world that is furthest away from the actual world given the second set. We can further say that one belief set takes up at least as much representational space as another just in case the representable world that is furthest away from the actual world

given the first is at least as close to the actual world as the representable world that is furthest away from the actual world given the second. Then we can capture the relative representational power of distinct belief sets succinctly as follows: (a) one belief set represents more about the world than another just in case the first takes up more representational space than the second; and (b) one belief set represents at least as much about the world as another just in case the one takes up at least as much representational space as the other.

Our account can also be used to explain how it is that one individual can represent at least as much (or more) about a particular slice of the world. Consider, for example, an individual whose belief set, though perhaps not representing at least as much about the world in general as that of another individual, does nonetheless represent at least as much about Russian history in particular as that of the other individual. On our account, an explanation of this could be given as follows. First, we can talk of representational Russian history space as consisting of the ways in which Russian history might be represented (“representable Russian history worlds”). Then we can say that one belief set takes up at least as much representational Russian history space—occupies at least as much volume in representational Russian history space—as another just in case the representable Russian history world that is furthest away from (i.e. most dissimilar to) the actual Russian history world given the first set is nonetheless at least as close to the actual Russian history world as the representable Russian history world that is furthest away from the actual Russian history world given the second set. Thus the one individual’s belief set represents at least as much about Russian history as the other’s because the one’s belief set takes up at least as much representational Russian history space as the other’s.

Importantly, the relative representational power of a belief set, on this sort of account, needn’t be a function of the number of beliefs contained in the set. Consider another example to illustrate the point, involving two sets of beliefs about the coffee beans in a storage container. One set, B_1 , contains a greater number than the other, B_2 : whereas B_1 contains exactly twenty beliefs, B_2 contains only six. Does it follow that B_1 represents more of the relevant slice of the world—facts pertaining to the beans in the container—than B_2 , even supposing that all of the beliefs in both sets are true? It would seem not. For suppose further that the respective contents of B_1 and B_2 are exhausted as follows:

$B_1 = \{$ *there are more than 5 beans in the container, there are more than 6 beans in the container, there are more than 7 beans in the container, there are more than 8 beans in the container, there are more than 9 beans in the container, there are more than 10 beans in the container, there are more than 11 beans in the container, there are more than 12 beans in the container, there are more than 13 beans in the container, there are more than 14 beans in the container,*

there are more than 15 beans in the container, there are more than 16 beans in the container, there are more than 17 beans in the container, there are more than 18 beans in the container, there are more than 19 beans in the container, there are more than 20 beans in the container, there are more than 21 beans in the container, there are more than 22 beans in the container, there are more than 23 beans in the container, there are more than 24 beans in the container}
 $B_2 = \{$ *there are more than 5 beans in the container, there are less than 30 beans in the container, the beans are darkly roasted, the beans were produced in Brazil, the beans were once seeds of a *coffea arabica* tree, the beans generate an excellent crema for espresso when ground and brewed}*

There seems to be an obvious sense in which B_1 is more impoverished than B_2 when it comes to representational power with respect to the relevant slice of the world: despite its greater number of elements, B_1 represents less overall about the coffee beans in the container than B_2 . So representational power need not be a function of the number of beliefs in a belief set, but may rather be a function of the kind of beliefs the set contains. And the representational space account of relative representational power allows us to make sense of this: B_2 represents more about the world than B_1 because, despite containing fewer beliefs than B_1 , it takes up more representational space than B_1 . The representable world that is furthest away from the actual world given B_2 is still closer to the actual world than the representable world that is furthest away from the actual world given B_1 (e.g., a world in which the beans are not roasted at all and did not derive a *coffea arabica* tree).

In this sense, the representational power of testimony may typically be at least as great as that of any other belief source: the set of beliefs typically generated in human cognitive agents by testimony might—in accordance with the scope claim—represent at least as much of the world as the set typically generated by any other belief source, because the set of beliefs typically generated by testimony may take up at least as much representational space as the set typically generated by any other belief source; and this even if—contrary to the number claim—the set of beliefs typically generated by testimony does not contain as many members as the set typically generated by other sources.¹²

So understood, we think the scope claim carries a good deal of plausibility; more, at any rate, than either the number claim or the reliability claim. But what makes for the plausibility of the scope claim?

We think it has to do with the relative domain generality/specificity of testimony. A belief source is highly domain specific, we'll say, to the extent that it yields output beliefs whose contents are about a very specific (or limited) subject matter.¹³ The more a source yields beliefs whose contents are not about any specific subject matter but about various different subject matters, the more domain general it is.

Perceptual sources are highly domain specific in this sense: they typically yield beliefs whose contents are just about the (objects of the) experiences they take by way of inputs. Whatever the particular problems involved in understanding the nature of perceptual belief contents (e.g., If we are looking at the light from a star long-since burned out, do our resultant visual beliefs include a past object among their constituents? Do our beliefs about Mars acquired through observation of pictures taken by the Mars robot, *Sojourner*, amount to visual beliefs?), none would seem to call into question the central thought that the contents of perceptual beliefs are in some intuitive sense always about perceptual experiences (or what they, in turn, are about, if we think of the experiences as representational in nature), i.e. that perceptual beliefs are experientially laden.

Inference, by contrast, is not highly domain specific: it typically yields beliefs whose contents are about a wide variety of distinct subject matters—as many, one might plausibly suggest, as human cognitive agents are typically capable of conceptualizing. At any rate, inference is clearly not experience-domain specific in the way that perceptual belief sources are.

And the same holds true of testimony: like inference, it is not highly domain specific. The potential range of subject matters that testimonial belief contents are about is constrained by little more than the contents of the reports/receptions of which serve as its inputs. Testimony, like inference, is highly domain-general relative to perceptual sources, yielding beliefs—to paraphrase Lackey—about everything from nutrition, to effective medicine, to the use of consumer goods, to the shape of the world, to history, to science, to genealogy, to social and cultural identity, and beyond.

We doubt a case could be made that testimony is substantially more domain general than inference; given that inference operates on testimonial deliverances as much as on those of any other source, such a claim seems to be a non-starter. On the other hand, it seems that no good case can be made for the claim that inference is substantially more domain general than testimony. That leaves room for the claim that testimony is at least as domain-general as inference.

In which case testimony may well turn out to be, for typical human cognitive agents, at least as domain general as any other belief source: it is plausibly more domain general than any perceptual belief source; and it is plausibly at least as domain general as inference in its various modes. And if it is at least as domain general as any other belief source, then, it would seem, it stands as good a chance of yielding a sufficiently wide variety of beliefs to render its representational power (in the sense discussed above) at least as great as that of any other belief source.

5. Conclusion

In a tradition stretching back to Hume and Reid, it is common to attribute to testimony a very high level of cognitive importance. In this paper we've considered three options for grounding that putative importance: by appeal to (1) the number claim, according to which testimony typically generates at least as many beliefs for human cognitive agents as any other belief source, (2) the reliability claim, according to which testimony is at least as reliable as any other source, or (3) the scope claim, which has it that with testimony, at least as much as with any other belief source, we are able to represent significantly more of the world than we would be able to in its absence. Neither the number claim nor the reliability claim, we have argued, are plausible in the light of relevant empirical and conceptual considerations. The number claim founders on what we know about the relative input and output volume, and frequency of engagement, of perceptual belief sources like vision. The reliability claim loses its plausibility in the light of the levels of interpretive filtering required by testimony's nature as a non-basic source, if not straightforwardly as the result of psychological studies on its reliability. There seems, however, to be no empirical or conceptual objection to the prima facie plausibility of the scope claim as we have presented it. Given the domain generality of testimony as compared with perceptual belief sources, a good case may be made for its greater scope, or representational power, relative to them. And even if testimony turns out to be of no significantly greater scope than inference, the scope claim still stands.

Our overall argument does not, of course, amount to compelling positive case in favor of the scope claim. But we think it does at least serve a useful role in directing the attention of those interested in understanding the cognitive importance of testimony away from hopeless hypotheses and toward a more promising one.

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Resumo. Os teóricos da mente têm sustentado por longo tempo que o testemunho, como fonte de crença, desempenha um papel fundamentalmente importante na cognição humana. Não está claro, contudo, exatamente por que o testemunho recebeu tal importância cognitiva. Distinguimos três sugestões sobre essa questão: a *asserção do número*, que considera que a importância cognitiva do testemunho é função do número de crenças que ele geralmente produz relativamente a outras fontes de crença; a *afirmação de confiabilidade*, que liga a importância do testemunho à sua condutibilidade à verdade; e a *afirmação de escopo*, segundo a qual a importância do testemunho é função de seu poder representacional relativo, concebido de maneira não numérica. Depois de apresentarmos essas três sugestões,

argumentamos que há pouca esperança de fundamentarmos a importância cognitiva do testemunho ou na asserção do número ou na asserção da confiabilidade. Concluímos com uma exploração provisória da base e da plausibilidade da afirmação de escopo.

Palavras-chave: Crença; epistemologia; inferência; testemunho.

Notes

¹ Our concern is thus, more strictly speaking, with *human* testimony. Arguably, there are non-human—e.g. machine—forms of testimony, such as when one receives the report displayed on the screen of a calculator, by a Website “hit counter,” etc. For more on human vs. machine testimony, see Burge (1998) and Kusch & Lipton (2002).

² Audi distinguishes dispositional belief—a disposition to assent to the truth of a proposition—from a disposition to believe—a disposition to form a (dispositional or occurrent) belief. “By contrast with both of these cases of actual belief [dispositional belief, occurrent belief],” he writes, “propositions we are only disposed to believe are more like those a computer would display only upon doing a calculation, say addition: the raw materials, which often include inferential principles, are present, but the proposition is not yet in the memory bank or on the screen.” (Audi 1994, p. 420)

³ In the recollective sense, declarative memory may be understood as a cognitive process that yields the aforementioned activations or retrievals of beliefs stored in declarative memory in the preservative sense.

⁴ For more on the sort of (as McCormack (2001, p. 269) has called it) “experiential description” of episodic memory adopted here, and experientially-based approaches to distinguishing episodic from semantic memory in general, see Conway (2001), Dokic (1997, 2001), Hoerl (2001), and Martin (2001).

⁵ Which would, arguably, only strengthen the case against the semantic number claim: on the most interesting of nativist proposals, such as that of Chomsky (1966, 1975), large swaths of propositional attitudes towards, or beliefs about non-experiential contents—semantic memories in our terminology—are innately present in the human mind, and the number of semantic memories so given might well outnumber the number yielded by testimony in the typical human cognitive agent.

⁶ According to “reductionist” models of testimony, such as that of Fricker (1987, 1994, 1995) and of Hume himself, testimony reduces to a particular species of inference, where one moves inferentially from beliefs about what a speaker has reported and about her trustworthiness (or about the trustworthiness of others’ reports in general) to belief in the representational content of her report. So as to remain neutral for present purposes about the aptness of such reductionist accounts, our talk of inference may be understood talk of *non-testimonial forms of inference*. (On a reductionist account of testimony, the question about whether testimony typically yields at least as many beliefs as any other distinct source could be construed as a question about whether testimony typically yields at least as many beliefs as any other distinct source, *including non-testimonial forms of inference*.)

⁷ That testimony is often, or at any rate occasionally, insincere (i.e., that others’ reports at least occasionally fail to express their actual beliefs, and amount to instances of attempted

deception) seems only further to undermine the plausibility of the reliability claim; but our case in what follows will make no appeal to the prevalence of insincere testimony.

⁸ For more in the epistemological literature on the distinction between basic (or as they are sometimes called, “generative”) sources and non-basic (or “transmissive”) sources, see Goldman (1986, p. 83ff), Sosa (1991, p. 225ff) and Lackey (2008, Ch. 2).

⁹ Report reception can’t simply involve perception of the physical items that encode the report. As one of the authors has previously put it: “Both the monolingual Japanese hearer and the Anglophone hearer might equally perceive through their senses a speaker’s auditory deliverance ‘I’m tired today,’ even though only the latter may count as receiving the speaker’s report that he or she is tired today, because only the latter may understand the meaning of the perceived deliverance” (Matheson 2006).

¹⁰ Even on “non-reductionist” accounts of testimony, which reject the inferentialist picture, the point remains that the characteristic inputs to testimony include beliefs. So we need take no stand here on whether the reductionist or non-reductionist models are correct; in either case testimony counts as non-basic, and therefore includes more levels of interpretive filtering than basic sources like vision.

¹¹ Treanor himself remains uncommitted to this epistemic space account of knowing more. His central worry is that we have yet to be provided with a well-developed account of the notion of distance between epistemic worlds, and that in the absence of such a (further) account we may be doing little more than relocating, not eliminating, our puzzlement by appeal to the epistemic space account: whereas we were initially puzzled about how to understand knowing more, we are now just as puzzled about how to understand (e.g.) being at a certain distance from an epistemic world. An analogous worry might be raised about the representational space account that we build on the epistemic space account in what follows, but we are convinced that construing the relevant notion of distance between worlds in terms of similarity yields greater illumination and hence some diminishment of puzzlement.

¹² It’s also worth pointing out here that the scope claim, under the interpretation afforded by the representational space account, is quite consistent with a denial of the reliability claim, the appeal to distance from the *actual* world that is part of that account notwithstanding. Even if one belief set has fewer true beliefs than another, it can still represent at least as much about the world as the other on the representational space account, because the true beliefs it does contain may render its most distant representable world at least as close to the actual world as the most distant representable world of the other. Hence the set of beliefs typically generated by testimony, even if it doesn’t contain at least as many true beliefs as the set typically generated by a source like vision, can still represent at least as much about the world as the set typically generated by that other source. Hence testimony can typically represent at least as much about the world as a source like vision even if it is not typically as reliable as that source.

¹³ Cf. Fodor’s characterization of the domain specificity of psychological faculties: “Roughly, domain specificity has to do with the range of questions for which a device provides answers (the range of inputs for which it computes analyses)” (1983, 103). Note, however, that belief sources in the sense at play in this paper needn’t correspond to faculties, much less vertical faculties in the well-known Fodorian sense.