Mental Imagery and the Epistemology of Testimony

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1. Introduction

It's intuitive to think that, during testimonial belief transmission, mental imagery often occurs in the minds of both testifier and listener, with the content of the listener's imagery coming to resemble the content of the testifier's imagery. To bring this out, consider a case:

> **BAD KITTY:** Oliver hears a crash from the kitchen and goes to investigate. He finds a shattered vase on the floor next to the table it had previously been sitting on, as well as the cat jumping down from the table and bolting out of the room. Oliver's wife, Esther, soon comes home to find Oliver cleaning up the vase. Oliver tells her, "The cat jumped on the table and knocked the vase to the floor. I came out to the kitchen and saw her looking startled as she sped out of the room." Esther trusts Oliver's testimony and takes what he says at face value.

Assume Oliver believes everything he says and testimonially transmits these beliefs to Esther.

To see how mental imagery might come into such a case, first consider the testifier, Oliver. Oliver in part describes things he witnessed firsthand: seeing the cat looking startled and speeding out of the kitchen. If we imagine ourselves in Oliver's position as he recounts this experience, it seems he'd be recollecting what he witnessed in the form of an *episodic memory* while describing it. Oliver is also, in part, describing his reconstruction of events that occurred in the kitchen while he was in the bedroom: the cat jumping on the table and knocking the vase over. If we again put ourselves in Oliver's shoes, it would seem natural for him to *sensorily imagine* this as he describes it, as a way of mentally piecing together what he thinks happened. Next, consider Esther, the listener. We often imagine a scenario or event as we listen to testimony about it. We might expect Esther to be imagining the events Oliver describes, following along in her imagination with his descriptions.[1]

So, mental imagery often occurs in the minds of both testifier and listener, as a belief is transmitted from one mind to another. However, it's not obvious exactly what role, if any, such imagery plays in the belief transmission process. On one hand, it seems possible that it's purely

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[1] For simplicity, I'll continue to write about testimony in terms of a listener hearing a testifier's speech. But my arguments should apply to other ways of receiving testimony (e.g., via text, sign languages).

epiphenomenal—that, for example, acquiring a testimonial belief merely causes Esther to form mental imagery, rather than this imagery playing a psychological role in her belief formation. On the other hand, it's striking that, as transmission occurs, Esther constructs a representation of the events Oliver describes that resembles the representations of those events before Oliver's mind. Since testimonial transmission is a process in which information from one subject's mind is conveyed to another's, the fact that each comes to represent the world so similarly seems relevant to understanding the transmission process.[2]

In this paper, I argue that getting clearer on imagery's psychological roles in testimonial transmission has implications for some fundamental issues in the epistemology of testimony. I appeal to imagery cases of testimonial transmission to argue for a novel view about the justifying basis of testimonial beliefs—i.e., a novel view about the reason on the basis of which a listener forms a justified testimonial belief. On this view, the basis of a listener's testimonial belief that P can, in at least some cases, be the testifier's belief that P. In other words, a mental state in the mind of the testifier can serve as the basis of a belief in the mind of the listener. This is an "externalist" account of the epistemology of testimony, since it says factors external to a listener's mind can count as the justifying basis of her belief. I appeal to imagery cases to argue for this view against a widespread "internalist" approach to testimonial justification, on which only S's own mental states can serve as the basis of her beliefs.

In §2, I set up some general issues about the epistemology of testimony. I first describe what I take to be the standard internalist approach to theorizing about testimonial beliefs. On this approach, the basis of a testimonial belief always includes a mental state which represents the content of the testifier's utterance. I then contrast the standard internalist approach with my alternative, externalist view, which I'll call the "other minds approach."

§3 appeals to empirical evidence about imagery's psychological roles in testimonial belief acquisition to argue that the standard internalist approach fails to account for certain imagery cases. §4 then appeals to the same kind of imagery cases to argue against several alternatives to the standard internalist approach. §5 argues that the other minds approach gives a compelling account of these imagery cases. §6 extends the other minds approach from cases of successful belief transmission to cases in which a testifier intentionally misleads a listener, thereby revealing some interesting

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[2] A further complication: while it seems intuitive to say Esther's imagery would "resemble" Oliver's, it's not clear exactly what this means. I return to this below.

epistemological differences between the standard internalist approach and other minds approach. Finally, §7 considers whether the other minds approach could be extended to non-imagery cases.

2. The basis of testimonial beliefs: Two approaches

2.1. The standard internalist approach

This subsection first lays out the general internalist approach to epistemology, then explains the standard internalist approach to testimonial epistemology.

Internalists claim that a belief's justification depends only on factors which are "internal" to a subject's mind. This is most often cashed out as some version of the idea that a belief is justified by a subset of a subject's non-factive mental states (see, e.g., Feldman and Conee 2001; Wedgwood 2002; Huemer 2006; White 2014). An internalist might hold, for example, that a perceptual belief that P is justified by one's experience as of P, where experiences are characterized purely in terms of how things perceptually seem for the subject. Similarly, a belief that Q might be justified by the prior beliefs that P and that if P, then Q, where beliefs are characterized purely in terms of what a subject takes to be true.

Internalists (including those cited in the previous paragraph) often speak interchangeably about the mental *factors which justify* a belief and the *basis* of a belief. The basis of a belief is the *reason* (or set of reasons) on the basis of which one believes that P. So, to claim that a belief is justified by some non-factive mental state(s) is equivalent to claiming that the state(s) in question is/are the reason(s) on the basis of which one formed the belief. One's perceptual experience as of P, for example, can be the reason on the basis of which one believes that P.

I'll assume the orthodox, widespread view of epistemic basing which says the basis of a belief is the reason which *caused* that belief. Combined with the internalist commitments just sketched, this yields the view that the basis of S's belief is S's mental state(s) which caused S's belief. While there are many available accounts of basing that incorporate additional conditions besides causation, it's very common to include a causal condition at least as a necessary condition, even if not a sufficient one (for overviews of the literature, see Korez 1997; Sylvan 2016). And, as we'll see below, proponents of the standard internalist view of testimony discuss basing in terms of causation, in line with this view. Since both my negative and positive arguments in this paper will primarily concern this causal

component of basing, they'll apply to any account that includes causation as a necessary condition, even if they also include other necessary conditions.[3]

I turn now to the family of views I'll call the "standard internalist approach" to the epistemology of testimony, which I take to be the paradigmatic internalist way of understanding the justifying basis of testimonial beliefs. These views hold, in line with the broader internalist tradition, that the basis of a testimonial belief includes only mental states of the listener. In particular, they hold that it includes a mental state which somehow represents the content of the testifier's utterance. From that starting point, there are various ways of developing this standard internalist approach. Since it's the main approach I aim to replace with my alternative, externalist account, it's worth spelling out some versions of this approach in detail.

Perhaps the most common are what we might call "doxastic" versions of the approach. These views say that, in the process of acquiring a testimonial belief that P, one first forms a belief that a testifier said that P; one then comes to believe P (at least in part) on the basis of one's belief that the testifier said that P. In other words, one's belief that the testifier said that P is among the mental states which causes one to believe P.

Malmgren (2006) gives one statement of such a view. She says:

[S]uppose John tells me that it is raining, and that I… gain knowledge by (John's) testimony that it is raining. If you asked me *how* I know that it is raining, then presumably part of my (pretheoretical) answer would be: 'John told me,' 'John said so,' or 'John said that it is raining'… What my answer brings out is that part of my reason for believing that it is raining is that John said so. But that is just to say that my warranted (or knowledgeable) belief about what John said plays an epistemic role in the formation of my knowledge that it is raining (225).

Malmgren also claims that this specifically involves the belief about what the testifier said *causing* one's knowledge (sec. 7), and that this talk of "knowledge" is really elliptical for talk of belief (225, fn. 56). So, she takes it that a testimonial belief that P is caused (at least in part) by one's belief that a testifier said that P.

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[3] Since this causal view features heavily in my arguments, it's worth briefly sketching some support for it, though a detailed defense is beyond my scope. Turri (2011) defends it based on the fact that reasons for beliefs are *difference-makers*. Suppose you initially think S believes P based on some factor Φ. However, you then find out that Φ actually made no difference whatsoever to whether S believed P. Consequently, you'd likely no longer think S's belief was based on Φ. Turri argues that, since it's intuitive to equate difference-makers with causes, this suggests bases of beliefs are causes.

Barnett (2015) also endorses a doxastic version of the standard internalist approach. He first claims that "when a source of testimony tells you that P, what you learn first is not P itself but instead merely the fact that the source says that P"; subsequently, "on the basis of what you learn first"—i.e., that the speaker said that P—you're justified in believing that P (356-7). Barnett later writes about the basing relation in terms of causal relations between beliefs (378-9). So, it's clear his considered view is that the basis of one's testimonial belief that P includes the belief that S said that P.

Fricker (1987) is also plausibly read as endorsing a doxastic version of the standard internalist approach. As a general necessary condition for justification, Fricker argues that a "subject's belief must be causally dependent on his belief in (or some kind of sub-doxastic registering of) propositions… which, if articulated, would constitute a good argument for it" (61). She then argues, in line with the standard internalist approach, that the causes of justified testimonial beliefs include "a belief that the speaker has made an assertion with a particular content" (69-70).

We can also formulate "non-doxastic" versions of the standard internalist approach. On these views, the basis of a testimonial belief includes some non-doxastic grasp of the meaning of an utterance. We can generate versions of the standard internalist approach by substituting in any such view of language comprehension. For example, Longworth (2018) argues that comprehending an utterance "P" involves, rather than a belief about what a speaker said, a first-order attitude towards P, something akin to entertaining P. He then argues that a listener moves from understanding an utterance to accepting its content, a process of forming a belief "on the basis of having understood" the utterance (829).

There are other non-doxastic views of comprehension to which we could appeal to flesh out the standard internalist approach. For example, *perceptual* views of comprehension hold that, when we hear an utterance, we literally hear the meaning of that utterance (Fricker 2003; Brogaard 2018). Such views aren't necessarily developed as accounts of the basis of testimonial beliefs, but it's easy to see how we could position them as such, along the same lines as Longworth's account.

So, various epistemologists endorse some version of the standard internalist approach.[4] Furthermore, it makes sense to call this the "standard" internalist approach because it's simply a

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[4] I've argued that various epistemologists take the basis of testimonial beliefs to include a mental state representing the content of the testifier's utterance. But are they really all full-blooded internalists about testimony—i.e., they include *no* factors in a listener's basis which are external to her mind? Their full accounts of the listener's basis suggests they are. Malmgren (2006, sec. 8) unpacks the listener's basis in terms of an inference from other beliefs; Barnett (2015) explicitly claims the

natural way of applying internalist ideas to testimony. Epistemologists—both internalist and externalist—often claim that, intuitively, it seems natural to cite the fact that a testifier said that P when asked about the reasons for one's testimonial beliefs (Fricker 1987; Malmgren 2006; Nagel 2021). If internalists want to accept this intuition, they must give a mentalistic interpretation of it. It seems natural to construe it as indicating that one's testimonial belief that P was caused by a mental state representing what the testifier said. (I agree that this evidence is prima facie intuitively compelling, even though I ultimately argue against this approach.)

Proponents of the standard internalist approach differ as to exactly what else is included in the justifying basis of testimonial beliefs, besides agreeing that it includes a representation of the content of the testifier's utterance.[5] However, my arguments in §3 will aim to undermine any view which accepts this point, so I needn't go into detail about other conditions they endorse.

2.2. The other minds approach

This paper defends an alternative to the standard internalist approach, one on which the basis of a listener's testimonial belief needn't include only the listener's mental states. Instead, the listener's testimonial belief that P can be based (at least in part) on the testifier's belief that P. In other words, the testifier's belief can be among the reasons which cause the listener's belief. I call this view the "other minds approach," since it says the basis of a listener's belief can be located in another person's mind. (Hereafter, for simplicity, I'll refer to the other minds approach as the view that testifier's belief can be *the* basis of the listener's belief, though I leave open whether other factors are also included in that basis.)

I'll remain neutral about the precise scope of the other minds approach. I'll only argue that, contrary to the standard internalist approach, there are at least some cases in which the testifier's belief is the basis of the listener's testimonial belief. I therefore won't take a stance on whether the internalist approach fails as an account of every single case of testimonial belief, as opposed to merely failing in

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listener's justification depends solely on "internal" factors (357); Fricker (1987) discusses justification in terms of an ability to re-construct a chain of doxastic or sub-doxastic causes of a belief; and Longworth (2018) argues comprehension "immediately" justifies testimonial beliefs, language epistemologists typically use to mean one's justification doesn't depend on any other premises or beliefs.

[5] Strictly speaking, the authors I cited don't explicitly claim this is the *only* way to form justified testimonial beliefs, rather than merely one way among others. However, since their stated goal in the cited works is to give an account of the epistemology of testimony, and since they don't describe alternative belief forming processes, I assume they take the process they describe to be distinctive of properly testimonial beliefs.

certain cases. Even so, the other minds approach is quite a departure from the internalist way of conceiving the basing relation, on which the basis of one's belief must be a mental state in one's own mind.

In §5, I'll defend the other minds approach by considering cases in which a listener constructs mental imagery which resembles the imagery before the testifier's mind. I'll motivate the approach by considering the nature of the causal relationship between each subject's mental imagery. Considering this relationship reveals that a relationship of basing holds between the listener's testimonial belief that P and the testifier's belief that P, since the relationship between their beliefs exhibits certain characteristic properties of basing.[6]

It might be tempting to think that the other minds approach is dead on arrival, since the testifier's belief is so far down the causal chain from the listener's. Philosophers sometimes argue that the basis of a belief includes only proximate causes of that belief (cf. Wedgwood 2002; Turri 2011). However, it seems there are many causal intermediaries between the testifier's belief and the listener's: the testifier's speech, the listener's perception of that speech, the listener's comprehension of what was said, and perhaps the listener's belief that the testifier said that P. So, one might claim that the testifier's belief is too far removed from the listener's to be its basis.

My goal is to close this apparent epistemological gap between the testifier's and listener's beliefs, at least in certain cases involving mental imagery. I'll argue across §§3-4 that, in certain such cases, no causal intermediary between the testifier's and listener's beliefs is part of the listener's justifying basis. Furthermore, I'll argue that the causal relationship which holds between the testifier's and listener's beliefs has the right properties to count as a basing relationship.

The first step is to argue, in the next section, that the standard internalist approach fails to account for the relevant imagery cases.

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[6] An anonymous reviewer suggests that the other minds approach may have undesirable consequences if the basing relation is *transitive*. Suppose the listener's testimonial belief that P is based on the testifier's belief that P, and that the testifier's belief is based on (e.g.) a past experience of P. If basing is transitive, then the listener's testimonial belief is also based on the testifier's past experience, which might seem counterintuitive. It's controversial whether basing is transitive. However, I'm happy to bite the bullet and grant to anyone who accepts this that the other minds view simply has a counterintuitive consequence: that the listener's basis includes the testifier's past experience. Furthermore, such a view isn't unheard of: at least one recent account of basing by a prominent externalist, Nagel (2021), agrees that the listener's basis extends back through the testifier's experience.

3. Problem cases for the standard internalist approach

§3.1 first appeals to empirical work on mental imagery and language comprehension to give an account of imagery's role in comprehending testimony. §3.2 then argues that the same mental imagery involved in comprehension can serve as the format of a listener's testimonial belief. §3.3 argues that, furthermore, a single process of mental imagery construction can *simultaneously* serve as both the means of comprehending testimony and of forming a testimonial belief. Finally, §3.4 argues that the internalist approach can't account for cases where imagery serves both these roles simultaneously.[7]

In identifying certain psychological roles for mental imagery in testimonial belief acquisition, I don't mean to imply that *all* cases of testimonial belief acquisition work this way or involve mental imagery. Instead, I merely aim to characterize a particular kind of case in which mental imagery is involved.

3.1. Mental imagery in testimonial comprehension

§2 described some non-doxastic accounts of testimonial comprehension—accounts on which we comprehend an utterance "P" by, for example, entertaining or perceiving its meaning. Recent empirical work on language comprehension suggests one specific way in which we often non-doxastically comprehend testimony: by constructing mental imagery of the situation described by that testimony. This involves grasping the content the testifier has expressed by constructing mental imagery representing it. In BAD KITTY, for example, Oliver's utterance "the cat jumped on the table and knocked over the vase" causes Esther to construct a mental image representing the state of affairs he describes, and she thereby grasps the meaning of his utterance.[8]

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[7] To further clarify the dialectic of this section: my accounts of imagery's role in comprehension (§3.1) and belief-formation (§3.2) will on their own be consistent with certain versions of the standard internalist approach. My arguments against this approach come in §3.4 and depend on the full picture developed across §§3.1-3.3, rather than on any part of this picture in isolation.

[8] Werning (2020) considers similar phenomena in developing his notion of "vicarious experiences," which occur when testimony generates "a rich, 'as if you were there' experience in the listener due to the vividness, detailedness, concreteness, intensity and emotionality of the linguistically conveyed content" (324). The kind of cases I'm considering include such "vicarious experiences." However, I don't restrict my focus to cases of recreating the speaker's experience in vivid detail. In BAD KITTY, Esther might imagine the cat knocking over the vase without vividly re-creating what it was like for Oliver to experience this: she might not recreate various details like the emotions Oliver felt, the way he acted in response to the cat knocking over the vase, etc.

Evidence for this form of comprehension comes from psycholinguistic studies of speech and text comprehension, on the basis of which its widely accepted that comprehension often involves mentally constructing a "situation model" of the scene described. At least in the kind of case I'm focused on, cases like BAD KITTY, such models are typically taken to be imagistic in format (Fincher-Kiefer 2001; Kurby and Zacks 2013; Zwaan 2016). As an interlocutor describes a situation to us, they prompt us to construct an imagistic representation of that situation, which is updated and modified as the conversation continues. We grasp the content a testifier has asserted by representing it in mental imagery.[9]

Fincher-Kiefer (2001) provides classic experimental evidence for thinking mental imagery can be involved in comprehension, as opposed to merely co-occurring with it. She hypothesizes that, if comprehending a story involves constructing mental imagery, then comprehension would be disrupted when subjects simultaneously engage in another task involving imagery—for example, holding some other, unrelated image in mind while reading. That's because, if their capacity to construct imagery is already in use for some other task, it can't be fully recruited for comprehension. Fincher-Kiefer found that subjects' comprehension is disrupted significantly more when engaging in simultaneous imagery tasks than when engaging in simultaneous verbal, non-imagery tasks, supporting the idea that imagery is involved in comprehension.

On the basis of such evidence, empirical researchers posit that situation modelling serves various functional roles related to discourse comprehension. For example, it allows one to connect a testifier's references to particular objects to one's own stored mental representations of those objects. In BAD KITTY, Oliver's references to "the vase," "the "cat," and "the kitchen" activate imagistic mental representations of those objects that Esther has stored from past experiences, allowing her to comprehend which particular objects Oliver is referring to. Situation models also allow one to mentally organize the individual elements of a scene into the particular spatiotemporal organization a testifier is describing, thus constructing an overall, coherent representation of that scene.

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[9] Situation models involve mental imagery in the same way episodic memory and other kinds of imagination involve imagery. Recent philosophical and empirical work has converged on the idea that images involved in remembering and imagining are constructed by combining details from past experiences (e.g., representations of objects one experienced in the past), guided by more abstract representations (e.g., background beliefs about the world, abstract "schemas" for general event types) (Michaelian 2016; Addis 2018). Work on situation modeling describes it similarly, as a constructive process that draws on various types of stored information and knowledge.

By playing comprehension-related roles like this, situation models ground the distinction between perceiving a testifier's particular words or utterances and comprehending *what the testifier said* about the world. In addition to perceptually experiencing an act of testifying, we comprehend that testimony by imaginatively representing the world as described by it.

Now, one might object that we can't comprehend speech (a propositional representation) by forming mental imagery (often described as an "imagistic" or "iconic" representation rather than propositional). On this objection, since speech has propositional content while imagery has imagistic content, it doesn't make sense to say we represent the content of an utterance in mental imagery.

However, there are various ways of responding to this objection. For one, we might just respond that mental images really can be vehicles for propositional content. This propositional view of mental imagery content is quite controversial (cf. Nanay 2015; Pearson and Kosslyn 2015). However, it coheres well with a broader picture many accept, on which other perceptually formatted representations have propositional content, including perceptual experience (e.g., Dretske 1997; Byrne 2009) and episodic memory (e.g., Fernández 2006; Byrne 2010). If one accepts this broader picture, then this response seems promising.

Alternatively, one might argue that the propositional/imagistic distinction merely concerns the *format* of representations rather than their *content*. As Nanay (2021, sec. 1.5) argues, it seems representations in these distinct formats can represent the same content—that, for example, the utterance "the cat broke the vase" can represent the same state of affairs as a mental image of the cat breaking the vase. If that's true, a mental image could be a way of comprehending the same content a testifier conveyed in their speech.

In what follows, I remain neutral between these two responses to the foregoing objection.

3.2. Mental imagery as format of testimonial belief

In addition to their role in comprehension, situation models are also often the representations we commit to long-term memory when retaining information about the world gleaned from testimony. In other words, rather than remembering a testifier's specific words or utterances, we often instead store a situation model of the situation they described to us (Zwaan and Radvansky 1998; Zacks, Mar, and Calarco 2018; McClelland et al. 2019).

Evidence for this comes from classic studies such as those by Bransford et al. (1972). In one such study, subjects first listened to a set of sentences being read to them, including one of the following:

(1) Three turtles rested *on* a floating log, and a fish swam beneath *them.*

(2) Three turtles rested *beside* a floating log, and a fish swam beneath *it.*

Later, subjects were asked to identify which sentences on a second list they recognized as having heard previously. This second list included one of the following:

(3) Three turtles rested *on* a floating log, and a fish swam beneath *it.*

(4) Three turtles rested *beside* a floating log, and a fish swam beneath *them.*

Notice that, while all of these sentences are superficially very similar (cf. Glenberg et al. 1987), the *scenes described* by (1) and (3) are the same, while (2) and (4) each describe scenes distinct from the rest. When asked to recall which sentences they recognize, subjects who'd earlier heard (1) are highly likely to mistakenly say they recognize (3), while they can much more easily discriminate between all other pairs of sentences.

The standard explanation of such results is that subjects don't tend to retain and then recollect a representation of a speaker's particular words or utterances. Instead, they store a situation model of the scene described by those utterances. When listening to the second set of sentences, they then retrieve this stored situation model as a means of determining whether they previously heard any of those sentences.

The kind of case just described involves committing to memory information about a toy, fictional scene—one doesn't actually take the world to be such that three turtles sat on a log while a fish swam beneath them. However, we can apply the same kind of distinction between storing a representation of the speaker's words and storing a situation model of the scene these words describe to cases like BAD KITTY, where what's described is instead the actual world. We can distinguish Esther storing a representation of Oliver's utterances, such as "the cat knocked over the vase," from Esther storing a representation of the scene Oliver's utterances describe, i.e., the cat knocking over the vase. The difference between this case and the turtle/fish case is that Esther isn't storing a representation of a fictional scenario. Instead, Esther is storing a representation of *the way the world is*, as learned from Oliver's testimony. Committing a situation model to memory is therefore a way for her to remember *the fact that* the cat knocked over the vase, information acquired when Oliver's testimony prompted her to imagine this scene.

This suggests that, in addition to its role in comprehension, such mental imagery can also be the format of a listener's testimonial belief. That's because this imagery plays the same functional role that we'd assign to a belief acquired from testimony. Acquiring a testimonial belief is a process of

acquiring some information about the world from a testifier, after which one can store this belief and have it available for later retrieval. And, in the kind of case I just described, one doesn't comprehend testimony via mental imagery and then subsequently form and store a distinct representation or belief. Instead, the situation model constructed in response to testimony *is* the format in which one acquires and retains information from testimony—it's the means by which one adds information gleaned from testimony to one's existing set of information about the world. So, we should take such imaginative representations to be a listener's testimonial beliefs. [10]

My argument here assumes that beliefs can be imagistic. This is controversial but does have various adherents (Kaplan 1968; Van Leeuwen 2013; Langland-Hassan 2020). My view is that, once we recognize that imagistic situation models can play the functional role of testimonial beliefs, this gives us a positive reason to accept that beliefs can be imagistic, at least in relevant cases.

One might object that beliefs are propositional attitudes while mental images are non-propositional. There are at least two ways we might respond. If the propositional/imagistic distinction is taken to concern content, then we might argue mental images do in fact have propositional content (see the end of §3.1 for more on this view). Alternatively, if the propositional/imagistic distinction concerns format rather than content (see again the end of §3.1), we might argue that the considerations I've given in this section reveal some beliefs are non-propositional after all. I'll remain neutral between these responses. [11]

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[10] Strictly speaking, the evidence I described for this view is consistent with thinking that we form and store both a situation model *and* a distinct belief. However, given that the situation model already plays the functional role of a belief, it would be psychologically redundant to posit two, distinct representations playing this same role. In general, we should avoid theories that posit redundant entities when a simpler theory would do just as well.

[11] An anonymous reviewer objects that my argument in this subsection relies on an overly simplistic understanding of memory storage and retrieval. Recent empirical work reveals that, when we perceive or imagine something, we don't simply store an overall copy of that percept or image, much as one might snap a photo then file it away for later retrieval. Instead, perceiving and imagining cause us to store representations of particular event details (objects, people, places, etc.), as well as form or strengthen associations between details. Retrieval is then a process of reconstructing a prior experience or image by activating event details and associations between them, in a way that's guided by more abstract beliefs, schemas for general event types, and the like (see fn. 10 above). It might seem that, when I say we construct a situation model then commit it to memory for later retrieval, I'm assuming the naïve "snapshot" view of imagistic representations. However, I think this objection relies on an overly simplistic view of the nature of belief storage and retrieval. On my account, constructing a situation model is a process of forming an occurrent testimonial belief. However, subsequently committing this belief to memory, making it available for later retrieval, needn't involve storing a

3.3. Comprehension and belief formation as simultaneous

When the very same instance of mental imagery is involved in both comprehending testimony and forming a testimonial belief, can we both comprehend and acquire a belief from testimony *simultaneously*, via a single process of constructing that imagery? Or, must we always first comprehend testimony by constructing mental imagery and then, subsequently, *accept* or *assent to* the content of this imagery as true, only after which it becomes a belief? I think it's plausible that the two are often simultaneous due to the role of *trust* in acquiring testimonial beliefs.

I'll adopt Nguyen's (forthcoming) account of trust as an *unquestioning attitude*. Nguyen argues that trust needn't involve an explicit attitude towards a testifier, nor a conscious decision to trust a testifier. Instead, trusting a testifier often involves a disposition to accept what she says as true, without deliberating about it or pausing to evaluate her testimony's merits. In other words, accepting trusted testimony simply involves a *lack* of actively questioning or deliberating. In this sense, Nguyen argues that our relationship to those we trust is very much like our relationship to our own cognitive faculties. Unless we're aware of a reason not to, we're disposed to simply treat the information delivered by these faculties, such as perception and memory, at face value. Likewise, trusting a testifier involves being disposed to immediately accept the content of her testimony as true, with no intervening checking or deliberation.[12]

Sometimes, we initially distrust a testifier, or we're initially unsure about whether to trust her. Often, though, we *already* trust a testifier prior to receiving testimony. I'll assume that this is the case in BAD KITTY: that Esther already trusts Oliver before receiving his testimony. (It's controversial how often we trust testifiers prior to receiving their testimony; for my purposes, all that matters is that

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replica of the image one initially constructed. Various philosophers argue that we can possess *implicit* beliefs (e.g., Gertler 2011), and implicit representations more generally (e.g., Dennett 1982), whose contents depend on their interrelations with other, explicit representations. If the process of memory encoding stores enough explicit information that it produces a relatively stable disposition to, upon retrieval, reconstruct a prior conscious situation model, then I see no reason to deny that one has (implicitly) committed that situation model to memory. For related discussion about episodic memory, see Munro (2021).

[12] It's beyond my scope to offer a detailed defense of Nguyen's account, but I'll sketch two considerations. First, as Nguyen argues, it seems his account accurately captures one central, paradigmatic instance of trust: children's trust in their caregivers. It seems doubtful that young children typically deliberate or form conscious attitudes before trusting their caregivers—instead, under normal circumstances they're simply disposed to take them at face value. Second, Nguyen's account has some support from neuroscientific research on trust: Schjoedt et al. (2013) argue, based in part on neuroscientific study of trust in charismatic religious authorities, that trust involves the brain inhibiting executive functioning and error monitoring, so that listeners simply passively rely on trusted subjects.

we do so at least sometimes, which seems accurate at least in the context of close personal relationships.)

If a listener already trusts a testifier—i.e., is pre-disposed to simply take her at her word—then we should expect her to automatically add the content of that testifier's word to her existing store of beliefs about the world (cf. McDowell 1994; Westra and Nagel 2021). This seems to fit with the phenomenology of accepting trusted testimony. Imagine being Esther in a case of trust like BAD KITTY in comparison with this case:

> **SUSPICIOUS ESTHER:** Oliver tells Esther, "The cat jumped on the table and knocked the vase to the floor." Because Esther knows Oliver is clumsy and has a track record of lying about breaking things around the house, she suspects he might be trying to cover up the fact that he broke the vase himself. She's therefore hesitant to accept what he tells her and suspends judgment.

Here, Esther could still comprehend Oliver's testimony by engaging in situation modelling for the purpose of mere comprehension. But what distinguishes this case from BAD KITTY is that she uses mental imagery merely to entertain what Oliver tells her rather than trusting him and therefore automatically accepting what he says at face value.

Now, if testimonial comprehension and belief formation were distinct states or processes, we might expect automatic, trusted acceptance to involve the former process automatically causing the latter. That would be a version of the standard internalist approach on which comprehension of a speaker's utterance causes a testimonial belief, thus serving as its basis. So, on their own, these considerations about the nature of trust don't suggest anything about the causal relationship between comprehension and belief formation.

However, in cases involving imagery, these considerations about trust give us reason to think comprehension and belief formation can occur simultaneously. In BAD KITTY, Esther's construction of mental imagery can be both the process by which she comprehends Oliver's testimony and the process by which she forms a testimonial belief. If Esther is predisposed to take Oliver's word at face value, then there's no reason to think she must *first* comprehend his testimony and *then* form a testimonial belief. That's because, if the same imagery serves both roles, it would be psychologically redundant to first entertain the content of his testimony and then, subsequently, accept it. Instead, we should expect that Esther's construction of imagery is simultaneously a process of comprehending Oliver's testimony and of forming a belief. In other words, since Esther is already disposed to accept

what Oliver says before he even says it, the imagistic process by which she comprehends his testimony will already be a process of adding the information he transmits into her existing store of information about the world.

Of course, it's ultimately an empirical question whether such construction of mental imagery ever simultaneously functions as both the process of comprehension and the process of belief formation. But my point is that we have theoretical reason to think the two can occur simultaneously, based on philosophical considerations about trust. If a listener trusts a testifier, it would be psychologically redundant to engage in two, distinct steps, since both comprehension and belief formation involve the same mental imagery. Unless we have good reason to favour a more complex theory, we should opt for a more simplistic theory over one that posits multiple, psychologically redundant processes.

To sum up this section so far: there are cases of testimonial belief acquisition in which the construction of mental imagery serves, simultaneously, as both the means of comprehension and the formation of a listener's belief. I next argue that the standard internalist approach to conceptualizing the basis of testimonial beliefs cannot account for such cases.

3.4. *Against the standard internalist approach*

The standard internalist approach says that a listener first represents the content of a testifier's utterance, either via a belief that the testifier said that P or via some non-doxastic way of grasping that content. This mental state then serves as (part of) the basis of the listener's testimonial belief. On an orthodox, casual picture of the nature of basing, this means the listener's mental state causes her testimonial belief. However, I now argue that this internalist approach cannot apply to cases on which imagery simultaneously serves as the process of both comprehending testimony and of forming a testimonial belief.

It should be clear why these cases preclude a picture on which a listener non-doxastically comprehends what was said and this causes her testimonial belief. In the relevant cases, the construction of mental imagery is the process by which we simultaneously comprehend testimony and acquire a testimonial belief. But, if this same process serves both of these roles simultaneously, then there's no point where a listener's comprehension causes her belief. Since the basis of a belief is its cause, it can't be that one's non-doxastic comprehension of what was said is part of the basis of one's belief.

Such cases also pose counterexamples to doxastic versions of the standard internalist approach, where a listener's belief that a testifier said that P causes her testimonial belief that P. That's because a listener has to comprehend an utterance before she forms a belief about what was said—one can't form a belief that a testifier said that P without comprehending the testifier's utterance "P." But, again, the process of comprehending testimony is, in the cases I've considered, simultaneously the process of forming a testimonial belief. If comprehension must come before a belief about what was said, and if comprehension and testimonial belief formation occur simultaneously, then testimonial belief formation also comes before a belief about what was said. It therefore can't be that one's belief about what a testifier said causally precedes one's testimonial belief.

The various versions of the standard internalist approach thus assume a picture of the psychology of testimonial belief formation which doesn't apply to the imagery cases I'm considering.

4. Other causal intermediaries between minds

The previous section opened up some room to argue for the other minds approach (according to which the testifier's belief can be the basis of the listener's belief), by rejecting the standard internalist approach. However, the basis of a belief is often thought to be causally very proximate to it. This might seem like a barrier to accepting the other minds approach, since the testifier's belief seems causally remote from the listener's. Before arguing directly for the other minds approach in §5, this section removes this barrier.

The previous section considered two potential causal intermediaries between the testifier's belief and the listener's: the listener's belief that the testifier said that P and the listener's non-doxastic comprehension of a testifier's utterance. However, if there are other causal intermediaries that could serve as part of the listener's basis, then it might seem we should try to develop our account in terms of these. In this section, I walk through several of these intermediaries, arguing that none of them counts as part of the listener's basis.

4.1. *Belief that the testifier believes that P*

The other minds approach holds that the listener's belief that P can be based on the testifier's belief that P. However, one might object that the listener's *belief that* the testifier believes that P is more causally proximate to her testimonial belief. So, an alternative view says that, in forming a testimonial belief, the listener first learns about what the testifier believes. Then, this belief that the testifier believes that P is among the causes of the testimonial belief that P.

However, in the kind of imagery cases I considered in the previous section, the listener's belief about what a testifier believes cannot be among the causes of her testimonial belief. Before the listener can form a belief about what the testifier believes, she first has to comprehend the testifier's utterance: since an utterance serves to express the testifier's belief, it's only by comprehending the utterance that the listener learns what the testifier believes. So, comprehending an utterance must be causally prior to forming a belief about what the testifier believes. In the cases I'm considering, though, comprehension is simultaneous with forming a testimonial belief. Thus, in these cases, forming a testimonial belief that P must be prior to forming a belief that the testifier believes that P. So, it can't be that a belief about what the testifier believes causes the listener's testimonial belief.

4.2. Perceptual experience of the testifier's utterance

There's a causal line that proceeds from the testifier's belief, through the testifier's utterance, through the listener's perception of that utterance, to the listener's imagery (i.e., the listener's belief). So, it seems that the listener's perceptual experience of the testifier's utterance is a mental state that's causally proximate to her testimonial belief. Thus, another potential alternative to the standard internalist approach is to give an account of the listener's basis in terms of this experience. However, I now argue that, in the imagery cases I'm focused on, the listener's experience isn't part of her justifying basis.

First, note that, if this experience is part of the listener's justification for her belief, it must be so in the sense that it's part of an inference from this experience to her belief. That's because the contents of one's experience of a testifier's utterances are quite distinct from the contents one ends up believing. In BAD KITTY, for example, Esther auditorily perceives Oliver uttering strings of words that form sentences (e.g., "the cat knocked the vase to the floor"), while she acquires a testimonial belief not about words, sentences, or utterances, but about the situation Oliver describes (the cat knocking the vase to the floor).

A justified transition from the perception of an utterance "P" to a belief that P would therefore require something in addition to the mere perception of the utterance—something more like an inference that includes additional premises connecting the content of one's perception to the content of one's testimonial belief. Such premises might include, for example, one's linguistic knowledge about what the testifier's words mean or evidence from the meanings of past similar utterances one experienced, which would allow one to justifiably infer one's testimonial belief. Suppose, for example, that one knows from past experience that an utterance "P" has the function of presenting proposition

P as true; based on this knowledge, in conjunction with one's present experience of a testifier uttering "P," one might then justifiably infer P.

Now, I take it as intuitively clear that Esther's belief in BAD KITTY is justified as long as she has no reason to think Oliver is untrustworthy or that his testimony is misleading.[13] So, if the justifying basis of Esther's testimonial belief is to include her perception of Oliver's utterance, this basis must also include other premises that allow her to justifiably infer her testimonial belief from her perception of this utterance. However, I'll now argue that, in the kind of imagery case on which I'm focused, it's implausible that we go through an inferential process to transition from perceiving a testifier's speech to acquiring a testimonial belief.

As Burge (1993) points out about testimony in general, introspective evidence suggests we don't go through any kind of inferential process to transition from perceiving a testifier's speech to comprehending it; rather, such transitions seem quite fast and automatic.[14] According to my account of relevant imagery cases in §3, comprehending testimony is simultaneous with acquiring a belief from it, via a single process of imagery construction. So, if Burge is right that the transition from hearing a testifier's speech to comprehending it is merely causal rather than inferential, the same would go, in these cases, for the transition from hearing the testifier's speech to forming a testimonial belief.

Now, Burge's opponents have pointed out that this introspective evidence isn't airtight: it's plausible many of our everyday inferences are based on tacit or implicit premises, rather than performed in an explicit, consciously introspectable way (Christensen and Kornblith 1997; Malmgren 2006). However, empirical facts about the relation between perceiving speech and perceptual processing help support Burge's view in my imagery cases.

Both behavioural and brain imaging evidence suggest that perceiving speech rapidly and automatically modulates perceptual processing, such that the brain automatically begins constructing perceptual representations of objects referred to in speech (Lupyan and Clark 2015; Boutonnet and Lupyan 2015). Importantly, this includes the modulation of very low-level perceptual areas typically thought to be encapsulated from conscious reasoning or inferential processes. So, for example, hearing

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[13] After all, BAD KITTY is a mundane, straightforward case of testimonial belief formation, with nothing epistemically suspect going on: Esther simply trusts her spouse, Oliver, so takes what he says at face value. Unless we want to be skeptics about much of our everyday testimonial belief formation, it seems we should consider Esther justified.

[14] Burge's full account of testimonial justification is complex, and I don't mean to endorse his entire picture (see Malmgren 2006 for detailed discussion). Rather, I just endorse this specific claim about the relation between perceiving speech and comprehending it.

the word "cat" cues the visual system to expect to see a cat even before one has been visually presented with a cat. This amounts to the brain automatically beginning to construct a visual representation of a cat prior to perceiving a cat, which then has measurable effects in terms of speed and performance on object recognition and perceptual discrimination tasks.

This sort of mechanism plausibly also explains why the brain automatically constructs mental imagery in response to perceiving speech, as in the kinds of testimony cases I'm considering (Clark 2016, ch. 3; Jones and Wilkinson 2020). Sensory imagining involves constructing perceptual representations in absence of stimuli. So, if our brains automatically construct perceptual representations in response to speech, we should expect this to result in conscious mental imagery in cases where one isn't presented with a relevant stimulus (e.g., where one hears a description of some object or scene but that object or scene isn't currently present to be perceived). In the kinds of cases I've been discussing, this seems intuitive and phenomenologically apt: when listening to a testifier triggers mental imagery, this imagery often occurs automatically and unreflectively. This is explained by the fact that, when speech triggers perceptual processing, this is an automatic and non-inferential process rather than a personal-level, inferential one.

So, in my imagery cases, the transition from perceiving a testifier's speech to acquiring a testimonial belief is a non-inferential one, a merely causal transition that occurs when the perception of speech automatically activates mental imagery. I argued above that, if the listener's experience is part of what justifies her belief, this would require additional, inferential steps linking the content of the experience to the content of the testimonial belief. So, a listener's experience of a testifier's utterances isn't part of the justifying basis of her testimonial belief.

4.3. The testifier's utterance

Again, there's a causal line that proceeds from the testifier's belief, through the testifier's utterances, through the listener's experience of those utterances, to the listener's imagery. So, the remaining causal intermediary that might count as part of the listener's basis is the testifier's utterance itself. (This is already quite a departure from the internalist approach, since it cites a cause that isn't one of the listener's mental states.)

However, the same arguments I just gave in §4.2 regarding the listener's experience of the testifier's utterance can easily be extended to the testifier's utterance itself. If the content of the listener's experience of the utterance doesn't justify the listener's belief, then neither does that utterance itself, since the content of one's experience just is that utterance. So, assuming Esther's

testimonial belief is justified in BAD KITTY, we can't appeal to Oliver's utterance in an account of the basis of her belief.

5. In defense of the other minds approach

This section defends the other minds approach, an externalist alternative to the standard internalist approach. On this approach, a listener's testimonial belief that P can be based on the testifier's belief that P, meaning the listener's basis can be a mental state in another person's mind.

So far, I've mainly considered mental imagery in testimonial belief *formation*. This section builds up to arguing for the other minds approach by first considering imagery's role across the testimonial transmission process, from the mind of the testifier to the mind of the listener. §5.1 considers the role of mental imagery in the mind of the testifier, i.e., in the *production* of testimony. I argue that the listener's mental imagery can be the format of the belief the listener brings to mind and then transmits to the listener. §5.2 then characterizes the intimate causal relationship that, in relevant cases, holds between the mental imagery in both subjects' minds. Since the mental imagery in each mind is the format of each subject's belief, this amounts to characterizing the causal relationship between their beliefs. §5.3 then argues that this causal relationship is a relationship of basing, thus defending the other minds approach.

5.1. Imagery in the production of testimony

§1 noted that mental imagery often occurs in the mind of the testifier while producing descriptions of some scene. In BAD KITTY, we'd expect Oliver to episodically remember the events he perceived firsthand as he describes them, as well as imagine the events he mentally re-constructed. Neuroimaging evidence suggests such imagery does often occur: producing a narrative or descriptions of a scene often involves visualization and other imagery-construction processes, either episodic remembering or imagining (Mar 2004; Zadbood et al. 2017).

What role, exactly, does this imagery play in the process of producing testimony? Plausibly, a testifier like Oliver "reads off" descriptions of a scene from the mental imagery before his mind. Episodic memory allows one to bring to mind a rich representation of an event, via a mental image which re-creates one's experience of the event and contains various information about it. One can then select particular elements of a memory image's contents to report, describing them in one's utterances (cf. Koriat and Goldsmith 1996; Mahr and Csibra 2018). Sensory imaginings can play a similar role, given their similar format to episodic memory: one can imagine something and select aspects of one's mental image to report.

I'll now argue that, when Oliver's imagery plays this role in the production of his testimony, it's because his imagery is the *format in which he brings to mind his beliefs* about the events he's testifying about. He then shares these beliefs with Esther via testimony.

In order for one's utterances to constitute genuine testimony about a particular event, one must be *thinking about* that event, with one's utterances causally connected in the right way to these thoughts. One could merely recite some words one has memorized and *appear* to be producing testimony about that event, but actually testifying about *that* event seems to require mentally representing it. In Oliver's case, he does this by bringing to mind mental imagery, where the content of this imagery causally determines the content of his testimony.

More specifically, though, when testimony is a means of sharing a *belief* about an event, it seems that a testifier's utterances need to be causally connected to her belief: the testifier must bring her belief to mind and generate her testimony based on this belief. In other words, one's belief must play the very functional role I just attributed to Oliver's mental imagery in BAD KITTY. This suggests that Oliver's mental imagery is the format of his occurrent beliefs about the events he's describing.

So, when one perceived an event firsthand, one can bring to mind beliefs about it in the form of an episodic memory of the event. One can then share one's beliefs by expressing the contents of that memory in testimony. Similarly, sensorily *imagining* can be a way to bring to mind beliefs about an event. As Oliver does, one can imaginatively "simulate" an event one didn't witness firsthand in order to arrive at beliefs about it. One can then share one's beliefs by reporting the contents of that imagining. In both memory and imagination cases, one's imagery of an event is the format of one's beliefs about that event.

5.2. Imagery across testimonial transmission

So far, I've separately covered the roles imagery plays in the minds of the listener (§3) and testifier (§4.1). However, it's not merely that imagery happens to occur on both sides of the knowledge transmission process. Rather, there's a more intimate relationship between both subjects' imagery.

Consider how, as Esther imagines in response to Oliver's descriptions, we'd expect Esther's imagery to *resemble* Oliver's imagery—i.e., the way Esther imagines the events described should resemble the way Oliver remembers and imagines them. The neuroscience of speech production and comprehension is consistent with this: brain imaging shows that the neural patterns underlying situation modelling in the listener's mind typically mirror those underlying the testifier's imagery (Hasson et al. 2012; Silbert et al. 2014), while the degree of similarity correlates with the degree to

which a listener comprehends and can later recall the contents of testimony (Stephens, Silbert, and Hasson 2010; Zadbood et al. 2017).

But what, precisely, does it mean to say that the listener's imagery "resembles" the testifier's? We can cash this out in terms of the content of each's imagery, or the information contained in each's imagery: if Oliver's imagery represents the cat knocking over the vase, then Esther's imagery resembles Oliver's when it represents the same content (of course, we wouldn't expect these images to perfectly resemble one another; I'll gloss over this complication for now, returning to it momentarily). Since I've argued that the mental imagery in each subject's mind is the format of their beliefs, this means that for a listener to form imagery that mirrors the testifier's is for her to form a belief with the same content as the testifier's belief.

So, in relevant imagery cases like BAD KITTY, testimonial belief transmission is a process in which the listener constructs imagery whose content mirrors the content of the testifier's imagery. Furthermore, I already argued in §4.2 that a testifier's utterances cause a listener to construct mental imagery in an automatic, non-inferential way. With this in mind, we can see that there's a tight causal relationship between the testifier's and listener's respective beliefs, which are connected via the testifier's speech. As per §5.1, the testifier's belief that P, in the form of an occurrent mental image, causes the production of his utterances; these utterances then automatically cause the listener to form a belief, constructing a mental image whose content mirrors that of the testifier's image.

Now, in BAD KITTY, it seems obvious that there would be many discrepancies in the specifics of each subjects' mental images. It's not as if they'd represent all the details of the scene the same way—exactly where the cat was on the table, the exact arrangements of the shards on the floor, etc. These discrepancies might seem to problematize my claim that the content of Esther's imagery comes to mirror the content of Oliver's. However, my account in the paper thus far can accommodate this with some slight refinements.

First, consider Esther. Notice that we wouldn't expect her to *believe* all the very specific details of her mental imagery, beyond those which correspond with the content of Oliver's testimony. Esther might believe the more general contents of her imagery, such as that the cat jumped onto the table and knocked the vase onto the floor. However, if we asked her whether she's imagining more fine-grained details accurately, we'd expect her to acknowledge that she isn't, and that she's withholding belief in those fine-grained contents. We can think of the contents of her imagery which she doesn't believe as details that are merely imaginatively "filled in" to fill out the scene. So, it's not strictly

speaking true that Esther's imagery is overall a single belief, which is how I've glossed things in the paper so far. Instead, her imagery is a *mix* of both belief and mere imagining.

While this might sound strange, it seems less so when we recognize that similar phenomena arise in other domains. For example, it's a widespread fact that episodic memories are imaginatively filled in in various respects, with only certain contents corresponding to past experiences (De Brigard 2014). This doesn't seem to prevent us from genuinely remembering the contents that *are* accurate (cf. Munro 2021), which makes one's mental image a mixture of remembering and imagining. Similarly, if one thinks that perception is a distinct mental state from hallucination, an experience that involves a hallucinated object in the foreground with a veridically perceived background seems to be a mixture of perception and hallucination. Since this sort of "mixture" of mental states can arise elsewhere, it's not so strange to say that Esther's imagery is a mix of belief and mere imagining.

Next, consider Oliver. We typically don't remember all the fine-grained details of an event accurately, since various details are imaginatively filled in (De Brigard 2014). However, we also don't typically *believe* those inaccurate, fine-grained details. Empirical study shows that subjects tend to generate memory-based testimony in ways that accommodate inaccuracies. When asked to describe a scene from memory, subjects tend to generate descriptions in a way that comes very close to optimizing accuracy; they do so by only reporting the particular details of a memory image in which they have high confidence, as well as by describing a scene at a high enough level of generality that their descriptions gloss over inaccuracies in precise details (Koriat and Goldsmith 1996). It thus seems that testifiers like Oliver withhold belief in specific contents of their mental imagery. Thus, like Esther, Oliver's imagery is a mix of belief and mere imagining.

Now, consider the relationship between Esther and Oliver's imagery. The contents of Oliver's utterances correspond only to contents of his imagery which he believes—for example, that the cat knocked over the vase. Furthermore, when Esther constructs her imagery, she forms beliefs in the contents that correspond to the contents of Oliver's testimony, rather than in the contents which are imaginatively filled in. Accordingly, the "resemblance" that's necessary for belief transmission between Oliver and Esther is a matching between a) the contents of Oliver's imagery that he believes and expresses in testimony, and b) the contents of Esther's imagery which are directly caused by Oliver's utterances.

5.3 In favour of the other minds approach

My account in this section so far reveals that, in the imagery cases on which I'm focused, there's a tight causal relationship between the testifier's and listener's beliefs. Furthermore, across §3 and §4, I argued that no causal intermediary between these beliefs is part of the basis of the listener's belief. In this subsection, I now argue in favour of the other minds approach by arguing that the causal relationship between each subject's beliefs has the characteristics of the basing relation. I'll begin with some more general discussion of the basing relation, then situate my imagery cases in relation to this discussion.

A belief can be based on another mental state either inferentially or non-inferentially. Perceptual beliefs are often thought to be non-inferential: one has a perceptual experience as of P, and this non-inferentially causes one to believe that P (e.g., Pryor 2000; Huemer 2006). It's also often thought that introspection is non-inferential: that mere introspective awareness of one's own mental states serves as the non-inferential basis for beliefs about one's mental states (e.g., Armstrong 1994). It's controversial whether perception and introspection are indeed non-inferential, but I'll assume they are in what follows. (This is merely so I have some illustrative examples of non-inferential beliefs, so readers who disagree can substitute their favourite examples.)

A paradigmatic case of inferential basing is forming the belief that Q on the basis of one's belief that P and one's belief that if P, then Q. As in this example, the contents of inferential beliefs are typically distinct from the contents of the bases on which they're formed. (Perhaps one could also infer that P from a belief that P; my point is just that it's a widespread feature of inferential beliefs that their contents are distinct from the contents of their bases.)

In contrast, as long as nothing has gone epistemically awry, the content of non-inferential beliefs matches the content of the mental states on which they're based. In perception, one typically forms the belief that P *because* the content of one's belief is causally sensitive to the content of one's experience as of P. However, when one has an experience as of P but forms the belief that Q—for example, if an experience as of a tomato on the table causes the belief that there's a watermelon on the table—this is because something has gone wrong. It could be, for example, that some psychological malfunction causes one's perceptual belief-forming system not to be properly sensitive to one's experience, or that one just wasn't properly paying attention to one's experience.[15]

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[15] An anonymous reviewer presses the following worry. Suppose I have an experience of P&Q, and, on this basis, I form the belief that P. It seems plausible that this belief could be non-inferentially

Similarly, in introspection, one typically forms the belief that one possesses mental state M *because* the content of one's belief is causally sensitive to the content of one's introspective awareness as of M. When one has an introspective awareness as of M but forms the belief that one possesses mental state N, this is because something has gone wrong. It could again be that some psychological malfunction has occurred in one's belief-forming process, or one could be somehow misled—for example, if a therapist one takes to be reliable has misled one to think an introspective awareness as of anxiety is caused by indigestion.

So, sensitivity of the content of a belief to the content of its base, such that the two end up matching, is a hallmark of non-inferential basing. Unlike inferential cases, the two only fail to match when things go wrong epistemically.

Now, my arguments above in §4.2 show that imagery cases of testimonial transmission are non-inferential. In that subsection, I appealed to empirical evidence to argue that hearing a testifier's speech causes a listener to construct mental imagery in a non-inferential way. So, if the listener's testimonial belief is based on the testifier's belief, we should expect the causal relationship that holds between their imagery to be structurally like the relationship between base and belief in paradigmatic examples of non-inferential belief, such as perception and introspection. In other words, we'd expect that the content of the listener's belief is causally sensitive to the content of the testifier's belief, such that the two end up matching, unless something goes wrong. I'll now argue that the relationship between the two beliefs does exhibit these properties.

First, consider when everything goes well in the belief transmission process, as described in §5.2. In relevant cases, testimonial transmission is a process in which the testifier's imagery causes his speech, which then directly causes the listener to construct imagery whose content recapitulates the content of the testifier's imagery. In these cases, each subject's imagery is their belief. So, when everything goes well and a belief that P is successfully transmitted from testifier to listener, the listener

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based on my experience of P&Q, while nothing has gone wrong in my belief formation. That would mean a belief that P could be non-inferentially based on a state with distinct content P&Q, rather than its content matching its base. In response, note that any experience which is accurately described as an experience of P&Q can *also* be accurately described as an experience of P. If I simultaneously experience a tomato on the table and an apple on the table, my experience can also accurately be described as either "an experience of a tomato on the table" or "an experience of an apple on the table" (hence, I could truthfully assert either "I see a tomato on the table" or "I see an apple on the table"). Similarly, an experience representing John as tall and thin is also accurately described as either representing John as tall or representing John as thin. Thus, any experience of P&Q is also an experience of P. So, any belief that P based on an experience of P&Q is based on an experience of P.

forms a belief with content P *because* the content of her belief is causally sensitive to the content of the testifier's belief. This looks much like the relationship between base and belief in perception and introspection.

Furthermore, the content of the listener's belief only fails to match the content of the testifier's belief when things go wrong. This could be because of a failure on the part of the listener, as in this case:

> **MISHEARING ESTHER:** Oliver tells Esther, "The cat broke the vase." Esther is only half paying attention to Oliver, and she hears mishears him as saying, "Matt broke the vase." She therefore forms the belief that their son Matt broke the vase.

A lack of sensitivity of the content of Esther's belief to Oliver's could also stem from a failure of Oliver to successfully transmit his belief:

> **MISSPEAKING OLIVER**: Oliver intends to tell Esther that the cat broke the vase. However, he accidentally misspeaks and says, "Matt broke the vase," causing Esther to form the belief that Matt broke the vase.

Both these kinds of cases involve a failure in the testimonial transmission process, the result being that the content of Esther's belief fails to be causally sensitive to the content of Oliver's belief. Barring such malfunctions in the transmission process, this sensitivity obtains. This again makes the relation between beliefs much like the relations in other cases of non-inferential belief.

So, in imagery cases of testimonial transmission like BAD KITTY, the causal relationship between the testifier's and listener's beliefs has the properties of paradigmatic cases of non-inferential basing. The content of the listener's testimonial belief is causally sensitive to the content of the testifier's belief, such that the listener forms a belief whose content matches that of the testifier's. And, when this matching fails to occur, it's because something has gone wrong (unlike cases of inferential belief, where the contents of beliefs are typically distinct from the contents of their bases, and where this doesn't necessarily mean anything has gone wrong).

This gives us inductive support for the hypothesis that the listener's belief is based on the testifier's belief, which in turn supports the other minds approach. Because the listener's belief is non-inferential in relevant imagery cases, this hypothesis predicts that the relationship between each subject's beliefs exhibits the characteristic properties of non-inferential basing. As I just argued, this prediction is confirmed both in cases where belief transmission goes well and in cases where it malfunctions.

The other minds approach thus gives a plausible account of imagery cases of testimonial transmission. Furthermore, §§3-4 have already argued that no causal intermediary between the testifier's and listener's beliefs is included in the listener's basis. So, given the absence of a plausible alternative view, we should accept the other minds approach. Thus, in at least some cases, the basis of the listener's testimonial belief that P is the testifier's belief that P.[16]

6. Intentionally misleading testimony and the epistemological significance of the other minds approach

To motivate the other minds approach, I argued that the testifier's belief can be the basis of a listener's belief. But what about cases where there's no testifier's belief to serve as the listener's basis because the testifier is transmitting information which she doesn't believe? In this section, I extend the other minds approach to such cases. In doing so, I bring out the epistemological significance of replacing the standard internalist approach with the other minds approach.

Notice that, even when the testifier doesn't believe the content of her own testimony, there can still be a causal relationship between representations in the minds of the testifier and listener. Consider:

> **LYING OLIVER:** Esther asks Oliver what happened to the broken vase. In reality, Oliver had knocked the vase off the table by accident. Ashamed to admit this, he quickly tries to imagine another scenario to explain why the vase is broken. He then reports the scenario he just invented in his imagination: "The cat jumped onto the table and knocked the vase to the floor." Esther trusts Oliver and accepts what he says.

Suppose Esther imagines what Oliver describes as a way of simultaneously comprehending his testimony and forming a testimonial belief, much as in BAD KITTY.

Even though Esther's belief is false, a causal relationship would hold between each subject's mental imagery that's similar to the one in BAD KITTY: Oliver has imagined a scenario; the content of his mental imagery causally determines the content of his utterances; and these utterances cause

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[16] Instead of the other minds approach, an alternative might be to argue—adopting Clark and Chalmers' (1998) "extended mind" thesis—that the testifier's belief can literally be a belief of the listener's, much as Clark and Chalmers argue entries in a notebook can be a listener's memories. To evaluate this, we'd have to explore whether the testifier's belief plays a functional role for the listener which is equivalent, in relevant respects, to the functional role of the listener's internal beliefs. While this is a very interesting line of inquiry, it's one I don't have space to explore here, though I hope to do so in future work. Thanks to an anonymous reviewer for suggesting it.

Esther to construct mental imagery of the scene Oliver describes. So, for all the same reasons for which I argued Esther's imagery was based on Oliver's in BAD KITTY, Esther's imagery is based on Oliver's in this case. The difference is that, in LYING OLIVER, Esther's belief is based on what is *merely* an imagining in Oliver's mind, while in BAD KITTY her belief is based on an imagining which is a belief.

Comparing LYING OLIVER and BAD KITTY suggests one way in which the other minds approach and the standard internalist approach differ in terms of which beliefs they count as justified. Assume that, in these cases, Esther has all the same internal mental states: her experience of Oliver's testimony, her belief about what Oliver said, and the like. The standard internalist approach would then count Esther's belief as equally justified in each of these cases, given the internalist commitment that only a subject's own mental states count as reasons for her beliefs.

However, the other minds approach would plausibly say Esther's belief has a greater degree of justification in BAD KITTY than in LYING OLIVER. In BAD KITTY, her belief is based on Oliver's belief. In general, a competent, trustworthy testifier's belief that P seems like a good reason to believe P, since what a fellow rational subject believes is typically a good guide to the truth. In contrast, Esther's belief in LYING OLIVER is based on a mere imagining. While I've argued that some imaginings count as beliefs, Oliver's in LYING OLIVER does not. In general, another subject's mere imagining doesn't seem like a good reason to form a belief, since people imagine things all the time that aren't true.

It therefore seems that, on the other minds approach, Esther has a good reason for her belief in BAD KITTY which she doesn't possess in LYING OLIVER. So, replacing the standard internalist approach with the other minds approach seems to have consequences for how we evaluate the epistemic status of testimonial beliefs.

7. Extending the other minds approach to non-imagery cases?

I've focused on a certain kind of imagery case, and my arguments have relied directly on the psychological roles imagery plays in such cases. §3 relied on the fact that the same instance of mental imagery can serve both comprehension and belief formation, building on this to argue, against the standard internalist approach, that the two can occur simultaneously. In arguing against various alternatives to the standard internalist approach, §4 relied again on this claim about simultaneity, as well as on evidence that a testifier's speech causes imagery in an automatic, non-inferential way. Finally,

§5 relied in part on this same point about the non-inferentiality of imagistic beliefs, arguing that the relationship between the testifier's and listener's beliefs is a basing relationship.

Imagery's role in language comprehension has been studied in depth, making imagery cases especially amenable to my empirically informed arguments. However, it seems many cases of testimonial transmission don't involve mental imagery. If I tell you, for example, that Descartes authored the *Meditations*, or that hydrogen's atomic number is 1, it doesn't seem like either my sharing or you acquiring these beliefs need involve mental imagery. Instead, such cases may involve representations with a discursive or linguistic format. It's therefore worth asking whether my arguments for the other minds approach could be extended to such non-imagery cases. I'll now sketch how such an extension might go, while noting where more evidence is needed to decide if it's successful.

Consider a more abstract description of the process involved in imagery cases, but one which doesn't mention imagery. A testifier first brings to mind a belief she wishes to share with a listener; then, the content of the representation before the testifier's mind causally determines the content of her utterances; finally, these utterances non-inferentially cause the listener to form a representation with the same content as the listener's belief, by which she simultaneously comprehends the listener's utterance and forms a testimonial belief.

It's possible that this same abstract structure could describe at least some non-imagery cases. If comprehension and belief formation can occur simultaneously in the listener's mind in non-imagery cases, then §3's arguments against the standard internalist approach to such cases would apply. Furthermore, if the listener's belief can be formed non-inferentially, then §4's arguments against alternatives to the standard internalist approach would also apply. And, if the listener's belief is non-inferential, then it could be causally sensitive to the testifier's belief in the way that's necessary for §5's arguments in favour of other minds approach.

All of this depends in part on some empirical questions. For example, it's an empirical question whether comprehension and belief-formation can occur simultaneously in non-imagery cases. One reason to think this is possible is that situation modelling processes similar to those operative in imagery cases have been used by some empirical researchers to describe non-imagery cases. Kintsch (1988), for example, describes the perception of speech as activating a purely propositional constructive process. This involves the activation of nodes in an associative network, where concepts and associations between them are activated to construct representations (e.g., concepts for *Descartes*,

Meditations, and *authored*). It's possible that, as in the case of constructing mental imagery, such situation modelling could simultaneously be a process of comprehension and belief formation.

It's less clear whether empirical evidence supports the idea that non-imagistic testimonial beliefs can be formed non-inferentially in response to a testifier's speech. My argument in the case of imagistic beliefs depended on the way speech automatically modulates perceptual processing, including low-level perceptual areas that are outside the remit of person-level inference. Since it relies on findings specifically about imagery, this argument can't simply be extended to non-imagistic situation models that are propositional in format. We'd therefore need some other kind of evidence.

For all I've said, we don't have reason to *deny* that my arguments could extend to some non-imagistic cases. However, more work needs to be done to settle this.

8. Conclusion

I opened §1 by noting the striking fact that, during testimonial transmission, a listener often constructs mental imagery that resembles imagery before the testifier's mind. This parallel between the way each subject represents the world seemed to cry out for an explanation, and I've argued that mental imagery often plays fundamental roles in the psychology of testimonial transmission. In cases like this, a listener's imagery can be intimately causally linked to the testifier's imagery.

Such cases pose a problem for the standard internalist approach to conceptualizing the basis of testimonial beliefs, on which a listener's basis is always one of the listener's own mental states. Based on the relationship between each subject's imagery, I argued that a listener's testimonial belief can instead be based on a testifier's belief. I therefore concluded that the basis of a testimonial belief can be external to the listener's mind.

Bibliography

Addis, Donna Rose. 2018. "Are Episodic Memories Special? on the Sameness of Remembered and Imagined Event Simulation." *Journal of the Royal Society of New Zealand* 48 (2-3): 64-88.

Armstrong, D. M. 1994. "Introspection." In *Self-Knowledge*, edited by Quassim Cassam, 109-117. Oxford: Oxford University Press.

Barnett, David James. 2015. "Is Memory Merely Testimony from One's Former Self?" *Philosophical Review* 124 (3): 353-392.

Boutonnet, Bastien and Gary Lupyan. 2015. "Words Jump-Start Vision: A Label Advantage in Object Recognition." *The Journal of Neuroscience* 35 (25): 9329-9335.

Bransford, John D., J. Richard Barclay, and Jeffery J. Franks. 1972. "Sentence Memory: A Constructive Versus Interpretive Approach." *Cognitive Psychology* 3 (2): 193-209.

Brogaard, Berit. 2018. "In Defense of Hearing Meanings." *Synthese* 195 (7): 2967-2983.

Burge, Tyler. 1993. "Content Preservation." *The Philosophical Review* 102 (4): 457-488.

Byrne, Alex. 2009. "Experience and Content." *The Philosophical Quarterly* 59 (236): 429-451.

———. 2010. "Recollection, Perception, Imagination." *Philosophical Studies* 148 (1): 15-26.

Christensen, David and Hilary Kornblith. 1997. "Testimony, Memory and the Limits of the A Priori." *Philosophical Studies* 86 (1): 1-20.

Clark, Andy. 2016. *Surfing Uncertainty: Prediction, Action, and the Embodied Mind.* Oxford: Oxford University Press.

Clark, Andy and David Chalmers. 1998. "The Extended Mind." *Analysis* 58 (1): 7-19.

De Brigard, Felipe. 2014. "Is Memory for Remembering? Recollection as a Form of Episodic Hypothetical Thinking." *Synthese* 191 (2): 155-185.

Dennett, Daniel C. 1982. "Styles of Mental Representation." *Proceedings of the Aristotelian Society* 83: 213-226.

Dretske, Fred. 1997. *Naturalizing the Mind.* Cambridge, MA: MIT Press.

Feldman, Richard and Earl Conee. 2001. "Internalism Defended." *American Philosophical Quarterly* 38 (1): 1-18.

Fernández, Jordi. 2006. "The Intentionality of Memory." *Australasian Journal of Philosophy* 84 (1): 39-57.

Fincher-Kiefer, Rebecca. 2001. "Perceptual Components of Situation Models." *Memory & Cognition* 29 (2): 336-343.

Fricker, Elizabeth. 1987. "The Epistemology of Testimony." *Proceedings of the Aristotelian Society, Supplementary Volumes* 61: 57-83.

———. 2003. "Understanding and Knowledge of what is Said." In *Epistemology of Language*, edited by Alex Barber, 325-366. Oxford: Oxford University Press.

Gertler, Brie. 2011. "Self-Knowledge and the Transparency of Belief." In *Self-Knowledge*, edited by Anthony Hatzimoysis, 125-145. Oxford: Oxford University Press.

Glenberg, Arthur M., Marion Meyer, and Karen Lindem. 1987. "Mental Models Contribute to Foregrounding during Text Comprehension." *Journal of Memory and Language* 26 (1): 69-83.

Hasson, Uri, Asif A. Ghazanfar, Bruno Galantucci, Simon Garrod, and Christian Keysers. 2012. "Brain-to-Brain Coupling: A Mechanism for Creating and Sharing a Social World." *Trends in Cognitive Sciences* 16 (2): 114-121.

Huemer, Michael. 2006. "Phenomenal Conservatism and the Internalist Intuition." *American Philosophical Quarterly* 43 (2): 147-158.

Jones, Max and Sam Wilkinson. 2020. "From Prediction to Imagination." In *The Cambridge Handbook of the Imagination*, edited by Anna Abraham, 94-110. Cambridge: Cambridge University Press.

Kaplan, David. 1968. "Quantifying In." *Synthese* 19 (1): 178-214.

Kintsch, Walter. 1988. "The Role of Knowledge in Discourse Comprehension: A Construction-Integration Model." *Psychological Review* 95 (2): 163.

Korez, Keith Allen. 1997. "Recent Work on the Basing Relation." *American Philosophical Quarterly* 34 (2): 171-191.

Koriat, Asher and Morris Goldsmith. 1996. "Memory Metaphors and the Real-Life/Laboratory Controversy: Correspondence Versus Storehouse Conceptions of Memory." *Behavioral and Brain Sciences* 19 (2): 167-188.

Kurby, Christopher A. and Jeffrey M. Zacks. 2013. "The Activation of Modality-Specific Representations during Discourse Processing." *Brain and Language* 126 (3): 338-349.

Langland-Hassan, Peter. 2020. *Explaining Imagination*. Oxford: Oxford University Press.

Longworth, Guy. 2018. "Understanding what was Said." *Synthese* 195 (2): 815-834.

Lupyan, Gary and Andy Clark. 2015. "Words and the World: Predictive Coding and the Language-Perception-Cognition Interface." *Current Directions in Psychological Science* 24 (4): 279-284.

Mahr, Johannes and Gergely Csibra. 2018. "Why do we Remember? the Communicative Function of Episodic Memory." *Behavioral and Brain Sciences* 19: 1-93.

Malmgren, Anna-Sara. 2006. "Is there a Priori Knowledge by Testimony?" *The Philosophical Review* 115 (2): 199-241.

Mar, Raymond A. 2004. "The Neuropsychology of Narrative: Story Comprehension, Story Production and their Interrelation." *Neuropsychologia* 42 (10): 1414-1434.

McClelland, James L., Felix Hill, Maja Rudolph, Jason Baldridge, and Hinrich Schütze. 2019. "Extending Machine Language Models Toward Human-Level Language Understanding." *arXiv:1912.05877*.

McDowell, John. 1994. "Knowledge by Hearsay." In *Knowing from Words: Western and Indian Philosophical Analysis of Understanding and Testimony*, edited by Bimal Krishna Matilal and Arindam Chakrabarti, 195-224. Dordrecht: Kluwer Academic.

Michaelian, Kourken. 2016. *Mental Time Travel: Episodic Memory and our Knowledge of the Personal Past.* Cambridge, MA: MIT Press.

Munro, Daniel. 2021. "Remembering the Past and Imagining the Actual." *Review of Philosophy and Psychology* 12: 175-197.

Nagel, Jennifer. 2021. "Losing Knowledge by Thinking about Thinking." In *Reasons, Justification and Defeat*, edited by Jessica Brown and Mona Simion, 69-92. Oxford: Oxford University Press.

Nanay, Bence. 2021. "Mental Imagery." In *Stanford Encyclopedia of Philosophy*, edited by Edward N. Zalta. Winter 2021 ed.

———. 2015. "Perceptual Content and the Content of Mental Imagery." *Philosophical Studies* 172 (7): 1723-1736.

Nguyen, C. Thi. forthcoming. "Trust as an Unquestioning Attitude." *Oxford Studies in Epistemology*.

Pearson, J. and S. M. Kosslyn. 2015. "The Heterogeneity of Mental Representation: Ending the Imagery Debate." *Proceedings of the National Academy of Sciences of the United States of America* 112 (33): 10089-10092.

Pryor, James. 2000. "The Skeptic and the Dogmatist." *Noûs* 34 (4): 517-549.

Schjoedt, Uffe, Jesper Sørensen, Kristoffer Laigaard Nielbo, Dimitris Xygalatas, Panagiotis Mitkidis, and Joseph Bulbulia. 2013. "Cognitive Resource Depletion in Religious Interactions." *Religion, Brain and Behavior* 3 (1): 39-55.

Silbert, L. J., C. J. Honey, E. Simony, D. Poeppel, and U. Hasson. 2014. "Coupled Neural Systems Underlie the Production and Comprehension of Naturalistic Narrative Speech." *Proceedings of the National Academy of Sciences of the United States of America* 111 (43): E4687-96.

Stephens, G. J., L. J. Silbert, and U. Hasson. 2010. "Speaker-Listener Neural Coupling Underlies Successful Communication." *Proceedings of the National Academy of Sciences of the United States of America* 107 (32): 14425-14430.

Sylvan, Kurt. 2016. "Epistemic Reasons II: Basing." *Philosophy Compass* 11 (7): 377-389.

Turri, John. 2011. "Believing for a Reason." *Erkenntnis* 74 (3): 383-397.

Van Leeuwen, Neil. 2013. "The Meanings of "imagine" Part I: Constructive Imagination." *Philosophy Compass* 8 (3): 220-230.

Wedgwood, Ralph. 2002. "Internalism Explained." *Philosophy and Phenomenological Research* 65 (2): 349-369.

Werning, Markus. 2020. "Predicting the Past from Minimal Traces: Episodic Memory and its Distinction from Imagination and Preservation." *Review of Philosophy and Psychology* 11 (2): 301-333.

Westra, Evan and Jennifer Nagel. 2021. "Mindreading in Conversation." *Cognition* 210: 104618.

White, Roger. 2014. "What is My Evidence that here is a Hand?" In *Scepticism and Perceptual Justification*, edited by Dylan Dodd and Ella Zardini, 298-321. Oxford: Oxford University Press.

Zacks, Jeffrey M., Raymond A. Mar, and Navona Calarco. 2018. "The Cognitive Neuroscience of Discourse: Covered Ground and New Directions." In *The Routledge Handbook of Discourse Processes*, edited by Michael F. Schober, David N. Rapp and Anne M. Britt, 269-294. New York: Routledge.

Zadbood, Asieh, Janice Chen, Yuan Chang Leong, Kenneth A. Norman, and Uri Hasson. 2017. "How we Transmit Memories to Other Brains: Constructing Shared Neural Representations Via Communication." *Cerebral Cortex* 27 (10): 4988-5000.

Zwaan, Rolf A. 2016. "Situation Models, Mental Simulations, and Abstract Concepts in Discourse Comprehension." *Psychonomic Bulletin & Review* 23 (4): 1028-1034.

Zwaan, Rolf A. and Gabriel A. Radvansky. 1998. "Situation Models in Language Comprehension and Memory." *Psychological Bulletin* 123 (2): 162.