



Quine, evidence, and our science

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Accepted: 27 January 2024
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Abstract

As is reasonably well-appreciated, Quine struggled with his definition of the all-important notion of an observation sentence; especially in order to make them bear out his commitment to language's being a 'social art'. In an earlier article (*Mind* 131(523):805–825, 2022), I proposed a certain repair, which here I will explain, justify and articulate further. But it also infects the definition of observation categoricals, and furthermore makes it a secondary matter, a seeming afterthought, that evidence, science and knowledge generally are shared—are joint, social and collaborative products. Without forsaking Quine's strict naturalism, I try to make the necessary adjustments to Quine's scheme.

Keywords Quine · Knowledge · Evidence · Observation sentences · Publicity · Social dimension

1 Introduction

Recent work in epistemology has often focussed on the social dimension of knowledge. Since we learn from others, trust, testimony and transmission would seem to figure essentially in any comprehensive account of knowledge. However, despite being the source of noted sayings such as 'Language is a social art', Quine's epistemology—its author's being a principal voice of the last generation of epistemologists—has difficulty in satisfying the apparent demands presented by the social demands of knowledge. In this piece, I will make certain adjustments to the fundamentals of Quine's picture, focussing on his account of evidence—striving not to stray from Quine's version of naturalism.

Since the difficulty, although fundamental, is not widely understood, I will introduce it in some detail in this introduction. According to Quine, the ordinary notion of 'evidence' is not quite useable, as-is, in serious epistemology (the reason will be outlined in Section I below). He proposes instead a linguistic surrogate.

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Rather than speaking of the ‘evidence’ for an empirical theory, we should speak of the relation of accepted ‘observation categoricals’ to a theory—where observation categoricals are sentences like ‘Whenever it’s snowing, it’s cold’. These are ‘standing sentences’ of the form ‘Whenever o_1, o_2 ’, with o_1 and o_2 being observation sentences (Quine, 1992 p. 1–6; Quine, 1981b p. 27). Observation sentences in turn are a type of ‘occasion’ sentence, which are sentences, by contrast with standing sentences, where one’s disposition to assent to them, as in the example ‘It’s cold!’, may vary without changing one’s on-going theory. What Quine terms the ‘empirical content’ for a theory is given by the totality of its observation categoricals (Quine, 1981b p. 28; Quine, 1992 pp. 16–18). He recommends this, needless to say, not as practical recommendation, but only for making precise philosophical sense of the path from sensory evidence to theory—*From Stimulus to Science*, to name his last book.

Observation sentences themselves are characterized specifically as “intersubjectiv[e]: unlike a report of a feeling [as in ‘I’m hungry’], the sentence must command the same verdict from all linguistically competent witnesses of the occasion” (p. 3). They are characterized still further in terms of their “stimulus meaning” (WO §8)—as sentences that are “associated affirmatively with some range of one’s stimulations and negatively with some range” (Quine, 1992 p. 3).

The apparent difficulty with this picture is that you and I may agree in our verdicts for a given utterance of an observation sentence, but what I mean and what you mean by the sentence, in the only sense of ‘meaning’ strictly speaking available to Quine, is not the same. In fact it never is the same. For ‘stimulations’, which figure in the characterization of observation sentences via stimulus meaning, are understood as triggered sensory receptors, and “two persons do not share the same receptors...[t]hey do not even have exactly homologous receptors”(Quine, 1981c pp. 50–51).

After *Word and Object* (1960) Quine acknowledged this difficulty—of the idiosyncrasy of the stimulus meaning of observation sentences—and took steps to circumvent it. In his last works of the 1990s he offered an evolutionary explanation, or at least a schema for one, of the intersubjective agreement of verdicts of observation sentences in terms of ‘pre-established harmony’. I will describe this further below. A further ramification—not discussed by Quine—is that the idiosyncrasy of stimulus meaning of observation sentences appears to infect the empirical content of an empirical theory, its collection of observation categoricals. An observation categorical like ‘When it’s snowing, it’s cold’ comprises observation sentences which have different stimulus meanings for you and for me, as I will explain.

I will propose an alternative, a scheme that:

- (1) Makes it straightforward that the content of observation sentences *and* that of observation categoricals are intersubjective, and does not vary across different speakers, at least not substantially.
- (2) Restores the concept of ‘evidence’: makes it straightforward to speak of ‘our’ evidence as well as the evidence of this or that individual, construing knowledge and theories as social phenomena, not as the possession of individuals.

- (3) Is consistent with Quinean basic tenets, and, in particular, serves the purposes of Quinean Naturalism and Naturalized Epistemology.

In an earlier piece (Kemp 2022) I have made part of the case for (1). I will explain this briefly below. I shall then propose an extension of the point to observation categoricals, and will make the case for (2). The resulting picture assigns a more robust objectivity to observation, and it allows us to speak without qualification of the evidence had by others, to make use of it, and to construe theories as straightforwardly public, collaborative, and as jointly held. (3) is a more acute matter than it might first appear, owing to the qualification ‘Quinean’. I will explain some of the main points in this respect, especially the importance for Quine of not simply acquiescing in Davidson’s recommendation of a distal conception of observation.¹

2 Observation, evidence and pre-established harmony

1. The relation of evidence to theory, and in particular of observation to theory, is of the first importance to any empiricist, and certainly so to Quine, who wrote such things as that “[T]he stimulation of his sensory receptors is all the evidence anybody has had to go on, ultimately, in arriving at his picture of the world” (1969, pp. 75–6). But Quine finds the notion of *evidence*, and indeed that of *an observation*, to be “awkward to analyse”—awkward on account of their naturally invoking objects, events, or *observations*, when his business is to illuminate the path from stimulus to science, a path which must show how and where reification of such things comes about (Quine, 1992 p. 2). We must not merely assume it from the beginning (see Quine, 1995a pp. 15–21; Quine, 1973 §10). As it happens, Quine makes it plausible that their crucial roles can be played adequately by his scheme of observation sentences and observation categoricals as described in the introduction.² The total empirical content of a given theory is the set of observation categoricals it implies, which may be thought of as those standing sentences of a theory—sentences which do not change their truth-value without altering the theory—which stand nearest to sensory stimulation (as before they are sentences of the form ‘Whenever o_1 , o_2 ’, with o_1 and o_2 being observation sentences). The observation categoricals are intersubjective and testable (by finding or making-true o_1 and checking for the truth

¹ Except in the most oblique way, I will not touch on three well-known issues that might be thought to arise with Quine’s account of evidence: the question of whether it provides, in a suitable sense, for the normative aspects of the theory-evidence relation (as in Kim 1988); the question of whether Quine’s picture involves an untenable distinction between scheme and content (the supposed ‘Third Dogma’ of Davidson [1974], [1982]); and the question of the ‘theory-ladenness’ of observation (e.g. Kuhn 1962). I will take the issues to have been adequately handled by Sinclair (2013).

² At Quine, 1992 p. 2, he concludes: “We can deal with the question of evidence for science without help of ‘evidence’ as a technical term.” At Quine, 1992 p. 5 he writes: “Observation sentences are thus the vehicle of scientific evidence, we might say—though without venturing a definition of ‘evidence’ itself.” It’s a way of finessing the use of the term, not a definition of the term or indeed an explication (in the sense of §53 of WO).

of o_2). It is these features that make it plausible that Quine's account does indeed provide what is wanted from the ordinary notions of evidence and observation, without ascribing an ontology or mechanisms of reference to the subject. Ontology and referents come so to speak later, gradually with the introduction of quantifiers, criteria of identity and other devices. Only then can the slogan 'to be is to be the value of a variable' get its expected grip (see Quine, 1981a pp. 1–8).

Quine's conception of an observation sentence was first announced in *Word and Object*. But this initial treatment of them might strike the unseasoned reader as ambiguous if not misleading. Quine writes: "All the objective data he has to go on are the forces that he sees impinging on the native's surfaces and the observable behavior, vocal and otherwise, of the native. Such data evince native 'meanings' only of the most objectively empirical or stimulus-linked variety." (1960, p. 25) And subsequently: "A visual stimulation is perhaps best identified ... with the pattern of chromatic irradiation of the eye" (p. 27), with the "ocular irradiation patterns" striking it (p. 28). One might think that by this he meant the nerves triggered as in the Introduction, but on the other hand one might well think that by "chromatic irritation" he means a pattern of light-rays, optically indifferent to what is being irritated.

In the years after *Word and Object* he affirmed that his intention was the bodily reaction to being impinged upon—the neural firing, not the "forces ... impinging on the native's surfaces", not the "chromatic irradiation" (1969 [1965], pp. 155–60). Later he speaks of the "stimulation undergone by a subject on a given occasion" as the "temporally ordered set of all those of his exteroceptors that are triggered on that occasion" (Quine, 1992 p. 2), with the "stimulus meaning" of an observation sentence being the range of stimulations correlated with the sentence (p. 3). Later still, Quine proposes in one of his 'Responses' to speak of "neural intakes" rather than "stimulations", distinguishing them from "bombardments" (1995b, p. 349).

2. This raises the question of how communication should after all be conceived, given that it is basic to the picture that communication at the level of observation sentences is what brings it about that "Language is a social art", as we read in the very first line of the Preface to *Word and Object*. What is communication at the level of observation sentences, if their stimulus meanings are not shared?³ Quine's final answer was as mentioned above: observation sentences should be conceived as those occasion sentences on which linguistically competent people agree—have the same dispositions to assent or dissent—upon 'witnessing' the relevant occasion (Quine, 1992 p. 3). And why should there be such sentences? Because, on Darwinian grounds, there is a parallelism in our inborn standards of perceptual similarity. We tend to display broadly similar dispositions to respond to the same or similar

³ For more on this question, see Pearson (2023), who, in describing the case for George Herbert Mead and Charles Morris' pragmatic and social accounts of meaning, interestingly sets the question for Quine, and describes the considerations that favour Davidson's 'transcendental' approach, an approach that builds objectivity out of sociality. As explained below however, that approach in effect gives up the game; the social aspects, if possible, should be analysed, not presupposed.

environmental stimuli—to track objects in the visual field, to expect like to follow like, and so on. Such dispositions are selected because the more such dispositions align with the environment, and the more such dispositions align with those of others, the more likely the creature will thrive and reproduce. Here then is Quine’s principle, or reasonable conjecture, of the pre-established harmony of perception—in a way very like Leibniz’ famous doctrine in its manner and purpose, but invoking Darwin rather than God, where the things harmonised are not states of monads but physical processes of physical creatures (first proposed around the time of *From Stimulus to Science*⁴; see Quine, 1995a pp. 20–21, 1996, p. 160, 2000, pp. 1–3).

3. Quine’s use of stimulus meaning describes observation sentences without appealing to the idea of distal reference. For epistemological purposes, Quine aims to illuminate the possibly complex ontogeny of reference, to discover the *Roots of Reference* to name the title of another of his books, not simply to employ the concept from the get-go, at least not if he can help it. This was made clear in his response to Davidson, who famously posited a ‘triangle’ between two present subjects’ mutual dispositions to assent, for example, to ‘There’s a rabbit’ and the distal cause of the two events—normally an event involving the referent of ‘rabbit’ (Davidson [1990]). Obviously, Davidson’s triangle is in some sense involved in communication, language-learning, and ordinary or commonsense translation. In Davidson’s eyes, the need for triangles shows that objectivity (of observation sentences) is grounded in such interpersonal or social facts, which must therefore simply be assumed.

Quine’s reluctance to take theoretical advantage of it can be divided into three components. First, some observation sentences—notably some simple ones such as ‘Dark!’—simply lack a conspicuous object of perception for the sentence to be about (1996, p. 161; 1993, p. 114). Second, perhaps to address that problem, positing situations or (centred) states-of-affairs as the entities which the subject perceives, or which in some sense serve as the referents or objective semantic correlates of observation sentences, is tantamount to positing something Quine famously rejects, namely propositions or facts. He averred that he is “put off by the vagueness of situations” (Quine, 1992 p. 42), that he is “reluctant to settle for situations as points of reference”; they “are of a piece with facts and propositions” (1993, p. 114). Third—and this is central here—to invoke the object of perception, the object of reference, does not explain how people manage to overcome their individual neurological idiosyncrasies to achieve reliable discourse ‘about’ the public, external objects. It just assumes that we do overcome it. From his naturalized epistemological point of view, Quine graciously declined to use Davidson’s scheme, for it assumed the very thing which he sought to explain: “I remain unswerved,” Quine writes, “in locating stimulation at the neural input, for my interest is epistemological, however naturalized” (Quine, 1992 p. 41; also see 1996, p. 161).

⁴ Evidently the idea was sparked by an exchange with Gary Ebbs; see Ebbs (2016), and Quine (2016a [1995]) and (2016b [1995]).

3 The method of stimulus fields and its extension

1. As suggested above, Quine’s initial characterisation of meaning-like surrogates for observation sentences might strike one as ambiguous—as when he writes for example that a “visual stimulation is perhaps best identified ... with the pattern of chromatic irradiation of the eye” (1960, p. 27). He subsequently emphasized that he meant the internal nervous reaction to such stimulus-events, not the external events themselves. In my 2022 (pp. 813–4), I suggested that we nevertheless take the requisite occurrences in this second way, where, for example, by ‘chromatic irritation’ is meant a pattern of light-waves, outside and materially independent of the individual. Similarly for sound and smell, with a more involved description being needed for the sense of touch (the sense of smell requires that the stimulus fields also include ambient chemicals; the senses of balance and gustatory taste are only marginally relevant for characterising scientific evidence).⁵

I will offer here only the most schematic rendition of the proposal (2022, pp. 814–20). Observation sentences are correlated with what I term ‘Stimulus Fields’, which are proximate in the requisite sense, but which are nevertheless the same for different subjects. The Stimulus Field for an individual subject and an individual observation sentence involves the region immediately outside the subject (say, within one centimetre), with a time dimension (say of a few seconds). The subject will be disposed to assent to the sentence in the presence of certain sensible features such as the patterns of light within the region (similarly for dissent and the absence of such features, and also for abstention, but I will suppress these details). The stimulus field (for a given sentence and subject) will be a class of such occasions (along with the sensible features). Most of the action, if not all of it, concerns the area around the head (the eyeballs, the nose, the ears). To get fields suitable not just for one subject and a single observation sentence, but for an arbitrary subject of the linguistic community with respect to a representative range of observation sentences of the community, we proceed as follows. Suppose we have the stimulus fields of a given observation sentence for an illustrative selection of the linguistic community. Find the common currency of these, where the common currency is an affirmative stimulus field that holds for a minimum of (say) 95% of the test subjects across the community. We thus have the stimulus field of a given observation sentence *simpliciter*. Now take the set of all the stimulus fields for a representative range of

⁵ Not only does ‘the sense of touch’ comprise several sensory capacities, the proximate-distal distinction, so important for sound and sight, does not obviously apply (see the next note). In a mini-conference held at Stanford in 1986, Quine responded to Dagfinn Føllesdahl’s suggestion that the work of stimulus meaning be done by ‘photographic plates’—placed at the location of the subject—by rejecting them as (1) figurative and (2) too limited, covering only vision (Marschall and Føllesdahl (manuscript), 300–2; at first—at 159—his response was more favourable). Quine did not, I believe, respond to Føllesdahl’s idea in print. In any case ‘stimulus fields’ answers both points.

observation sentences of the community—say for the simple observation sentences such as ‘It’s cold!’ and ‘Rabbit!’—with which the group is competent. This is the set of stimulus fields for all these observation sentences, the ‘total’ stimulus field.

For various technical details, along with extensions, complications, and answers to certain objections, again I refer you to the *Mind* paper.⁶

2. Stimulus fields are proximate rather than distal.⁷ Yet unlike stimulus meanings or ‘neural intakes’, they are jointly available to different subjects, taking each as the center of their respective fields. They are not the referents of terms, or of terms within observation sentences, any more than stimulus meanings are such referents. Yet you and I can agree on the ‘meanings’ or ‘contents’ of observation sentences—in a perfectly acceptable sense, that of having acquired dispositions to assent to them in response to their stimulus fields.

In a sense we can agree on observation sentences on Quine’s scheme as well, thanks to pre-established harmony—but only indirectly; only, as it were, by description. Under the adoption of stimulus fields, we can in effect agree directly on *what* the phenomenon we are responding to is, without appeal to pre-established harmony. The method of stimulus fields has observation sentences as ones that “hinge pretty strictly on the concurrent publicly observable situation” (1993, p. 39). It does not allow one to think of “correct translation of an observation sentence as preserving ... its *stimulus meaning*” (1996, p. 159, emphasis added), but it does allow one to think of correct translation of an observation sentence as preserving its stimulus *field*. On this view, stimulus fields, not stimulus meanings or neural intakes, are the central aspect of the “objective reality that the linguist has to probe” (1960, p. 35).

3. There is an important additional way in which the method of stimulus fields is an advance on that of stimulus meaning, one that concerns what I term the fundamental characterization of observation sentences. Two preparatory points.

First, in *Pursuit of Truth* Quine wrote:

The view that I have come to, regarding intersubjective likeness of stimulation, is rather that we can simply do without it. The observation sentence ‘Rabbit’ has its stimulus meaning for the linguist and ‘Gavagai’ has its for the native, but the affinity of the two sentences is to be sought in the externals of com-

⁶ These include: the relativity of some observation sentences to small subgroups (the fisher’s ‘I felt a nibble’, the trained musician’s ‘C major/second inversion’ identified by hearing); collateral information; theory-ladenness; needed variations of the ‘modulus’ (the temporal spread of the stimulus field); the problem of differing bodily shapes and sizes; and special difficulties presented by the various senses of touch.

⁷ In the spatial sense, ‘proximate’, according to the Oxford English Dictionary, means ‘neighbouring,’ viz., ‘immediately adjacent to’. Thus by the O.E.D. this scheme is proximate since that is precisely the relation in which one stands to one’s stimulus field. Some including Davidson have characterized Quine’s stimulus meaning as proximate, but according to the O.E.D., that is incorrect, since one’s sensory nerves are not ‘immediately adjacent’ to oneself.

munication. The linguist notes the native's utterance of 'Gavagai' where he, in the native's position, might have said 'Rabbit'. So he tries bandying 'Gavagai' on occasions that would have prompted 'Rabbit', and looks to natives for approval. Encouraged, he tentatively adopts 'Rabbit' as translation. (Quine, 1992 p. 42)

To seek something in the 'externals of communication' is not a precise scientific recipe or proposal.⁸ What is wanted, ideally, is not simply to presuppose the social dimension and to take advantage of it, but to analyze, or explicate, those aspects of it which concern us—something more in keeping with the (naturalized) epistemological claim that “[p]hysical things generally ... become known to us only through the effects which they help to induce at our sensory surfaces” (1960, p. 1).

Second, of an arbitrary observation sentence, Quine writes that “all members of the language community are disposed to agree on the truth or falsity of such a sentence on the spot, if they have normal perception and are witnesses to the occasion” (Quine, 1995a p. 22; also Quine, 1992 p. 3). This is its fundamental characterization. By an “occasion” we can take him to have meant merely a region of 4-D space–time, not anything like a fact or state-of-affairs. But by “normal perception” and “witnessing” he meant not just that the perceiver is present and is physiologically normal; he meant that the subject's perceptual equipment function adequately on the occasion, in the manner suited to the particular objects, events or states that are at issue. In other words, by “witnessing the occasion” he must have meant to include the perception of an environmental or distal event. That alone would have us back with Davidson. But in addition, Quine sought, from the time of *Pursuit of Truth*, to invoke a certain relatively sophisticated psychological capacity: “We judge what counts as witnessing the occasion, as in the translation case, by projecting ourselves into the witness's position” (Quine, 1992 p. 43; see also pp. 61–3, Quine, 1995a p. 89). For “[e]mpathy dominates the learning of language, both by child and by field linguist” (Quine, 1992 p. 42). This is no doubt true of ordinary translation. However, what we are seeking, if it is available, is a rigorous characterization of observation and evidence—the path from stimulus to science. The capacity for empathy may be a great facilitator, in standard practice even a humanly indispensable one, towards translation, understanding and camaraderie; but it is to be hoped that it is not strictly essential to translation itself, that it is logically independent of the brute facts discovered by translation. One thinks of certain kinds of autism, and of ordinary cases of translation where empathy is not obviously involved—translation of written signs, or by educated guessing not based on perceptions of the translatee. These suggest that even if empathy is a ubiquitous means of delivery, it is distinct from what is delivered. The same would go for such facts as salience in perception; one's speed in learning, for example, 'Rabbit!'

⁸ That is, the complaint is not simply that the language is vague; it is that it conceals what wants explaining (similarly, as below, the 'fundamental characterization' of observation sentences remains yet contains the phrase 'witnessing the occasion', even after the acceptance of Pre-Established Harmony). Thanks to a referee.

evidently implies that a certain innate structure of perception be posited, but this is a fact about the mechanisms underlying the ready acquisition of a stimulus field, not about the stimulus field itself.

On the method of stimulus fields, at any rate, we can drop the reference to the community's "witnessing the occasion." It is not needed. An observation sentence now receives its most basic characterization simply as one assent to which is correlated with some particular range of features of the relevant field—in particular, ones that remain correlated with dispositions to assent, with respect to the same or closely similar fields, for all or most subjects in the community. The matter is strictly behavioural, causal, and straightforwardly testable. It is proximate, not distal. The social dimension remains, but only in the sense that the status of a sentence as an observation sentence strictly requires more than one person, at least potentially. There is no need for empathy in the ground-floor introduction of observation sentences.

It is worthwhile to reiterate why Quine's idea of pre-established harmony of perceptual similarity does not offer a satisfactory response. "If two scenes trigger perceptually similar global stimuli in one witness," he writes, "they are apt to do likewise in another. This public harmony of private standards of perceptual similarity is accounted for by natural selection" (Quine, 1995a p. 21). Yet the definition of observation sentences remains unchanged (p. 20). The most that the appeal to pre-established harmony does is to explain *why*, in practice, the social criterion is adequate, despite the idiosyncrasy of stimulus meaning. Rather than identifying what this agreement consists in, it is to say that nothing is required beyond accord in the 'externals of communication'. By contrast, on the new view, the agreement straightforwardly obtains. Pre-established harmony meanwhile takes its place as both a principle and a topic of inquiry, for example, in human vision studies and its evolution.

4. We are almost ready explicitly to consider the positive socio-epistemological aspects of the envisaged move within Quine's Naturalized Epistemology, but we must first examine more closely the 'logic' or 'semantics' of observation *categoricals* (the inverted commas are there because what I'm about to say is related only tangentially to logic or semantics, in the proper sense of those terms). Henceforth in this sub-section and the next, when circumstances dictate, I will write 'content*' with an asterisk, intending a term of art—indifferently either stimulus meaning or stimulus field—not the intuitive notion of content or meaning.

Suppose then that an observation categorical 'Whenever o_1, o_2 ' is accepted and true. It comprises two observation sentences o_1 and o_2 , such that the situations in which one has a disposition to assent to o_1 are a subset of those in which one has a disposition to assent to o_2 . The categorical is itself a standing sentence, not an occasion sentence (therefore not an observation sentence). Typically, once established, it will be true for all time and taken to be so. The construction 'Whenever __, __' is not simply a truth-functional notion; nor does it involve the fully-fledged quantificational conditional (closer would be the Aristotelian A-type categorical, with the category restricted to times). Quine writes:

A generality that is compounded of observables in this way—‘Whenever this, that’—is what I call an observation categorical. It is compounded of observation sentences. The ‘Whenever’ is not intended to reify times and quantify over them. What is intended is an irreducible generality prior to any objective reference. It is a generality to the effect that the circumstances described in the one observation sentence are invariably accompanied by those described in the other. (Quine, 1992 p. 10; also see Quine, 1981b p. 27)

Quine has made the case, repeatedly, that a creature whose theory contains nothing more sophisticated than observation categoricals—along with observation sentences—would not thus be one for whom a theory of reference, and thus an ontology, would be needed adequately to describe its linguistic behavior (e.g. Quine, 1973 pp. 1–101; Quine, 1981a pp. 1–13; Quine, 1992 1–31; Quine, 1995a pp. 15–42).

An observation categorical is a standing sentence. There is no official Quinean description of its meaning or its content*. If nevertheless we insist on asking of a specific instance of an observation categorical, ‘What is its content*?’, then a Quinean can say, for an individual, that it is given by the stimulus meaning of o_1 and that of o_2 , plus an explanation of the device ‘Whenever __, __’. But observe now that it will be relativised to the speaker. Our shared agreement as regards the *truth* of the categorical can be explained, as before, in terms of our respective dispositions to accept o_1 and o_2 in various situations, which can in turn be explained in terms of pre-established harmony. But there is, strictly speaking, no such thing as an account of an instance of the categorical itself, not an account of its content* in general, but only for the categorical-for-you, for the categorical-for-me, and so on.

If we shift to an account that replaces stimulus meanings with stimulus fields, however, we have a simpler and more satisfactory account, one which delivers the result that our shared theories have precisely the same content* and precisely the same empirical content, across the linguistic community, without recourse to ‘witnessing the same’. The content* of the categorical is simply that of the ordered pair $\langle o_1, o_2 \rangle$, together as before with an explanation of ‘Whenever’.

It would be underhanded to insist that a representative of Quine answer all ‘What is the meaning of ...?’ questions. But content* is not meaning, nor is it the notion of content as philosophers use the term. I am saying merely that the method of stimulus fields better answers Quine’s problems as he sets them, a method that as far as I can see does not breach any constraint of Quine’s.

4 Evidence and social epistemology

1. Unlike the method of stimulus meanings, the method of stimulus fields enables us jointly to identify the self-same content* of an observation sentence or observation categorical. This removes a significant obstacle to our speaking of our facility with them as resting upon the same capacities. The account steers between the Scylla of

Internalism (which portrays language as disconnected from outer reality), and the Charybdis of Externalism (which builds a fully-fledged concept of reference—some would say a magical concept of reference—into the very rudiments of linguistic competence). Observation sentences and categoricals, it is well to be reminded, are of such urgent interest because they are envisaged as doing duty for the ordinary but critical notions of evidence and observation. They are the crux of claims to empirical knowledge, being its intersubjective, observational checkpoints, as well as being the stuff of prediction.

One is all admiration for Quine's way of finessing the concepts 'observation' and 'evidence'. Nevertheless, I think there is a more articulate way of conceiving what it is to have evidence for a theory that remains firmly in Quine's boat. Here is the first appearance of observation categoricals in Quine:

The construction can be seen rather as a simple one, learned early. The child may learn the component observation sentences 'Here is smoke' and 'Here is fire' by ostension, and then the compound is an eternal sentence that expresses his having become conditioned to associate the one with the other. (Quine, 1981b p. 27)

This comes on the heels of another, ultimately rejected idea, which I propose to resurrect. Before introducing observation categoricals, Quine had suggested that we "should limit our attention to conditional sentences 'If ϕ then ψ ' where ϕ and ψ stand for eternalized observation sentences referring to one and the same place-time" (Quine, 1981b p. 27).⁹ These are known as "observation conditionals" (Quine, 1981b p. 26; I assume that such conditionals presuppose some agent's having at least a momentary disposition to assent or dissent). An "eternalized observation sentence" is an observation sentence combined with its time and date of its acceptance, as in Quine's example (p. 26) "Raining at 42° N and 71° W on March 9, 1981, at 0500". Thus an observation conditional incorporating the example might be, for some agent, "If raining then clouds, at 42° N and 71° W on March 9, 1981, at 0500". They've become standing sentences, that is, 'eternal'.

Quine rejects these in favour of observation categoricals on the grounds that observation categoricals, unlike observation conditionals, do not require the time and date to be explicitly determined—only that the time of the consequent coincide with the time of the antecedent:

We thus run headlong into ... the problem of determining places and times on an observational basis. Even if we were to postpone the sophistication of latitude and longitude by starting rather with place names, we would still need to explain how to determine by name where we are at the time and, indeed, how

⁹ Not to be confused with 'pegged observation sentences' of Quine 1975 (pp. 316–317), which do come with a place/time stamp, but which are otherwise non-compound sentences, and do not require any observer.

to determine the date and time of day. (Quine, 1981b p. 26; also see Quine, 1973 pp. 37–9)¹⁰

Certainly, at the more rudimentary phases of language-learning, we cannot rightly require of the speaker explicit knowledge of place and time. But my proposal is to relegate explicit information of this kind to the academic interest of the epistemologist, somewhat as we take a similar attitude to the stimulus meaning of observation sentences (the sensory triggerings), or to the stimulus fields of observation sentences (the proximate causes of the triggerings). In particular, it is a requirement imposed by Quine's scheme that the observation categorical involve a relative time-indicator ('Whenever') that ensures that the time of the affirmation of the antecedent coincide with that of the consequent. Yet the aptitude for using them properly does not depend on explicit knowledge to that effect, no more than a forest-dweller's speaking of location does of precise location on a map. It is at most a matter of skill, of knowing-how. Likewise, a sensible way forward, for the new scheme, is that it should involve an implicit compound indexical 'Here, now', attached to the observation conditional as a whole—even if one needs the indexical parameters to be made explicit for one's additional theoretical purposes (indeed one could argue that such primitive indexicality is built-in to the observation sentences themselves, for their truth-values vary depending on context). Thus a suitable entry might be written as "[42°N and 71°W on March 9, 1981, at 0500]_i; If raining_i then clouds_i", with *i* being a tacit trace for the compound indexical. The material in brackets must be accurate, but needn't be explicitly grasped by the speaker. To be more realistic, there should be some flexibility in the place-time stamp—i.e., more forgiving than the strict example "42° N and 71° W on March 9, 1981, at 0500", and it ought to cover examples like "[...] _i If lightning_i then thunder_i" where there is a somewhat indeterminate delay—but let us skip over this.¹¹

2. I shall henceforth use simply 'observation conditionals' for this emended notion of Quine's 'eternalized observation conditionals'. Now in addition, we would like to have a register of our acceptance of observation *categoricals*, if we could have it. Obviously the requisite information is often available, or at any rate sometimes available. The firm acceptance of an observation categorical will, at least on occasion, depend on several occasions either recorded or remembered of affirmation of instances of the categorical, in other words of the corresponding observation conditionals (Quine acknowledges this at Quine, 1981b p. 28; I see no harm in referring to them as 'instances' of the categoricals).

¹⁰ He does not object that the observation conditional requires mastery of 'if-then'. There are difficulties here (Quine, 1973 p. 75–78), but one strategy is to invoke Quine's 'verdict functions', giving the observation conditional 'abstention' in the case where antecedent and consequent alike receive 'abstention'; the crucial thing is that the compound receive 'assent' in the 'assent, assent' case, and 'dissent' in the 'assent, dissent' case.

¹¹ There are evident connections here to 'Protocol Sentences' as discussed by Neurath, Schlick, Carnap and others in the late 1920s and early 1930s; see Uebel 2007.

Thus the picture is as follows. Consider an empirical theory, say some rendition of classical or standard chemistry which we will call T_C . By ‘observations’ germane to T_C , or ‘evidence’ for T_C , we shall mean the sum-total of observation conditionals that play a role in the testing of T_C . They will function much as observation categoricals do in the evidential support of T_C , but at a further remove, down at the particular level, such that many, if not all times, the support of an observation categorical will consist of numerous observation conditionals. As stressed, the conditionals are in principle fully public, the crucial parts of which being composed of observation sentences, which are now explained in terms of stimulus fields.

The observation conditionals are evidence for observation categoricals. This gets us close to what we intuitively want from an epistemology of empirical theories. If we want to examine the evidence for some theoretical claim of T_C , what we’d like is to find some record of actual, pertinent observations, where the observations are such that you and I, and others, could in principle have made the same or closely similar observations. As emphasized, perhaps few such observations will actually be recorded, but it is a measure of the objectivity of scientific practice that some of them, especially the crucial ones for establishing the more doubtful claims of T_C , are meticulously written down and propagated through the journals and other media. Some evidence is critical, and no wonder that in such cases it tends fastidiously to be recorded. To indulge a suitably adapted figure from Quine—though admittedly less memorable than Quine’s original—the basic evidential lore of our ancestors consists in this field of public items.

None of this is meant to suggest that observation conditionals are incorrigible, or that observation categoricals cannot be accepted for other, relatively theoretical reasons, without being actively supported by the corresponding observation conditionals. It is also meant as compatible with Quine’s final words on the subject of theory-ladenness and theoreticity, in his 1996, pp. 162–163 and 2000, pp. 489–491.

3. Observation categoricals may depend vitally for their acceptance on the corresponding observation conditionals having been logged, but in general, the bare existence of an observation conditional should not be assumed to depend on its actually being written down or said aloud. It is enough that an agent for a time should have assented to it if asked (thus some will be lost). Furthermore, it is consistent with the foregoing section that the evidence for an observation categorical may come from diverse sources—indeed it perchance happens that no one investigator is responsible for a sufficient collection of observation conditionals, yet the pooled collection is sufficient. This being so, I see no reason why the following inductive definition of something I will call ‘social-acceptance’ might not be advanced.

If p is an observation conditional, then:

1. B **socially-accepts** p from A if B accepts p upon hearing or reading an affirmation of p from A , and A , but not B , was present at the time and place of p ;
2. if B **socially-accepts** p , and C accepts p upon hearing or reading an affirmation of p from B , then C **socially-accepts** p from B .

3. There are no cases of **social-acceptance** that do not satisfy (1) or (2).

This ‘recursive’ structure shows how evidence might transmit through the community via social-acceptance. It makes it intelligible how one might claim to possess a theory such as T_C , plus the evidence which supports T_C , despite one’s actual experience with chemicals being comparatively scanty. To indulge another suitably adapted figure from Quine—again with apology—epistemology tracks evidence up the tree of social-acceptance.

Since observation conditionals, as just described, are not merely eternal or standing sentences, but along with observation categoricals are public in the requisite sense, should we include them in the official empirical content of the theories they support? Without going more deeply into the matter, I shall not recommend this, simply because Quine’s way seems to construe empirical content as something which *must* be grasped for a full grasp of a theory—even if such a person is merely ideal—rather than the more accidental nature of the observation conditionals. By comparison, the collection of observation conditionals which one accepts or socially-accepts may remain, and typically will remain, a comparative hodge-podge.

However, I should think it evident that awareness that *there is* evidence for a certain claim can play a substantial role in one’s acceptance of a theory, even if one does not know what the evidence is—that is, even if one is not conversant with any observation conditional that one accepts or socially-accepts. Indeed such a mechanism is surely rampant, but I shall merely mention it without pursuing it further.

5 Conclusion

For all his status as champion of science and scientific philosophy, Quine is sometimes criticised for not having gotten his hands dirty, for not having had much to say about actual scientific theories. To counter this, one could present Quine’s front-line work in Logic, Set Theory and perhaps, at least in the 1950s and 1960s, Linguistics. But there is a related concern: that Quine’s picture of what it is to ‘know’ a science fails to carry conviction because it depicts each scientist or informed layperson as having, in a sense, to build up the science anew, from the ground up. In order to make full justificatory use of them, one has to master a whole raft of observation categoricals for oneself.¹² What is more, what one learns in acquiring a raft of observation sentences and observation categoricals is alarmingly individualistic and idiosyncratic, if not private or subjective. There is so far as I can see no knock-down criticism in the offing of the Quinean picture, but the method

¹² Quine’s discussion of ‘perceives that’ (and ‘believes that’) in Quine, 1992 pp. 61–67 might be thought to go against this way of putting it. But besides Quine’s discussion being primarily directed to psychological statements themselves, my picture concerns only direct statements of evidence, not ones embedded within ‘perceives that’ or ‘believes that’ constructions.

of stimulus fields—especially in tandem with the notion of social-acceptance of the last section—shows how those uncomfortable results might be avoided, and much more forthrightly has subjects communicating via observation sentences and categoricals, as trading in objective evidence and observation, and as building up jointly the institutions of science.

So far I can see, the present suggestion is fully in-step with Quinean naturalistic and scientific epistemology. Besides not availing itself of first-philosophical premises or intuitions, it does not appeal at anything remotely like the foundational level to referential semantics. This is why, incidentally, I would resist the protest that what Quine described is only an idealized epistemic subject, and thus that all we need is the conceivability of a single person with all this knowledge. There is little point in such idealization when a bit more realism can be had for free.

Might not the present recommendation be combined with the mildly social view of knowledge which Adam Carter helpfully calls “summativist”, where group knowledge “is just an aggregate of individual knowledge” (2015, p. 713)? It is true that an emended Quinean view—stimulus fields plus social-acceptance—partakes of certain social dynamics. But the emended Quinean view does not quite embrace, without further ado, group knowledge in Carter’s sense, because group dynamics under the present scheme enable the *individual*—not the group—to secure knowledge in virtue of the evidence collected by others. On the other hand I don’t see why Carter’s group knowledge cannot coexist with the present recommendation, perhaps indeed with individual knowledge as traditionally understood. These may be regarded as variant sharpenings of ‘knowledge’.

This is to say nothing about more radical views which impute knowledge to groups where the group knows more than the sum of its individuals—to purported instances of ‘de-personalized’ knowledge, ‘social–social knowledge’ in Alexander Bird’s (2010) sense; nor about the *justification* of evidential claims, about their *reliability*, and how these features might propagate via chains of social-acceptance. Those are further topics, as is the notion of epistemic trust of agents in each other. I join Quine in his quiet scepticism about the prospects for a precise account of *knowledge*, but this does not mean I am sceptical of the prospects for an account of justification—or one of epistemic trust.¹³

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¹³ Thanks to Adam Carter, Andrew Lugg and the anonymous referees for comments.

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