



## Finding a context for objectivity

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### Abstract

Several and repeated attempts have been made to say what objectivity consists of and why it should be pursued in research. In the first part of this paper two main strategies are singled out, sharing the assumption that there is a way (or different ways) objectivity can be thought of in the abstract (which does not mean without content), and that it can be instantiated in context—and in enough contexts to justify the abstract case. But not only is this assumption open to the objection that objectivity so conceived does not admit of one clear definition (even a disjunctive one) that is appropriate in many or most contexts where we intend the term to do its work. It also does not seem to pay specific attention to what actually constitutes a context of practice, when we think of objectivity in some relation to such context. The aim of this paper is to question how context works both as a mechanism of meaning formation for the concept of objectivity, and as a practical framework for pursuing research objectively. To articulate a suitable notion of context some insight from recent literature in the philosophy of science is first introduced and then adapted to show how research practices successfully achieve objectivity as one of their aims. It will be argued that an idea of context that includes activities which (in a way to be qualified) are *relevant* and *reliable* towards a settled aim is the model of practice that makes objectivity a pursuable task in research. This contextual picture of objectivity, it will be suggested, might better serve the purpose of scientific research (including social research) than either of the two descriptive strategies outlined at the beginning of this paper can do.

**Keywords** Context · System of practice · Coherent activities · Relevance · Reliability · Aims, internal and external · Objective research

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## 1 Preliminary distinctions

A traditionally held claim normally associated with scientific inquiry is that via the right procedures and by applying the right rules we can obtain objective knowledge. Science does possess both. Therefore, objectivity is a reasonable expectation of scientific inquiry, and it is guaranteed by following the rules and procedures made available by science. The claim is threefold: besides being methodological, as just suggested, it is ontological (what goes into our knowledge is what there is ‘in the world’) and epistemological (knowing that something is the case equally translates into universal agreement about what is known)

On this general backdrop long-established debates on what scientific objectivity consists of include several and repeated attempts to say what objectivity consists of and why it should be pursued. And here things get more complicated. For the sake of brevity, we could classify these attempts in terms of two main strategies, which I name the ‘list strategy’ and, for lack of a better word, the ‘precisification strategy’. Both strategies attempt to clarify the meaning of the term ‘objective’, though by following two distinct routes. In the first case, in order to clarify what the term means a number of possible connotations and substitutes are summoned in ideal lists of what the concept seems to cover across domains and circumstances, and when applied at different levels and to different referents—processes, people, claims... So, on one side objectivity for example is said to entail

1. Grasping the real object (manipulable and convergent Objectivity<sub>1</sub>), detachment (value-freedom and value neutrality Objectivity<sub>2</sub>), intersubjectivity (procedural, concordant, interactive Objectivity<sub>3</sub>) (Douglas 2004).
2. Faithfulness to facts, absence of normative commitments, freedom from personal bias (Reiss and Sprenger (2017).
3. unique interpretation of a body of data (Hermeneutic objectivity), shared method (Procedural objectivity), independence of judgement versus publicity of judgment (Deliberative objectivity), avoidance of structural epistemic biases (Structural objectivity), evidence (Burch and Furman 2019).<sup>1</sup>

On the other side, the same strategy points at what requirements we should focus on in order to achieve all of the above: rigour, precision, accuracy, replicability of results, internal validity, reliability, empirical adequacy, measurability, consistency with an established body of knowledge, explanatory power....<sup>2</sup> According to at least one view, all or most of these features are secured by making use of the so-called Scientific Method. Here is a stereotypical sketch of this view: if we all follow the operations of the Scientific Method, and agree that they have been properly followed, then we conclude that the result is objective. That we all agree upon it is also taken to be an objective matter. Agreement is a direct consequence of having followed the appropriate procedure. Here all the supporters of the Scientific Method, from Bacon to Popper, agree that the most straightforward route to objective knowledge is following the instructions of scientific method (in whatever form this is argued to exist).

<sup>1</sup> For other lists see for ex. Loyd (1995), Fine (1998) and Megill (1994). I also had a go at the list strategy in my Montuschi (2014).

<sup>2</sup> Examples of these lists can be found in Kuhn (1977), Dupré (1993), Longino (1990) and Wylie (2003).

When the list strategy is endorsed, we often end up asserting that the concept of objectivity is inescapably complex, as (Douglas 2004) reminds us in mapping the operationally distinct modes that make up the different senses of the concept. Each mode itself includes multiple senses of the term, none of which is logically reducible to one hard core meaning. Complexity equally well accommodates a historically sensitive reconstruction of the concept, where objectivity is said to acquire different meanings depending on when it is invoked and what for (Daston and Galison 2007). But complexity also leads to endorsing a concept that is so widespread and diffuse that it might cast serious doubts on it being a universal guiding principle of research. What real use can we make of such a concept? A denialist attitude takes form, driving us to believe that we are better off without such a concept. No notion of objectivity, no matter how overarching or inclusive, produces any added value to calling, occasion by occasion, for whatever the specific circumstances require us to deliver on that occasion (Hacking 2015).

The ‘precisification strategy’ goes in the opposite direction: rather than indulging in complexity, it tries to simplify the concept by suggesting some kind of unifying definition that is able to overcome fragmentation or vagueness. Old examples of this strategy are for instance Nagel (1986)’s ‘view from nowhere’ or ‘objectivity as invariance’ as defined by Nozick (1998). A recent example is objectivity as ‘averting epistemic risks’ as advocated by Koskinen (2018). Of course, what risks will change with context, discipline, practice, but the underlying imperative that drives objectivity stays the same.

The overall strategy amounts to picking one meaning out of the several open-ended lists exemplified above (or adding its own further meaning) and making it work as a sufficiently high standard able to hold across different pronouncements and practices of scientific research. Historical diversity might accommodate also in this strategy: in different epochs objectivity meant different things to different community of researchers (Daston and Galison 2007), so each worked with a ‘precisified’ version of it. However, precision comes at a price. On one side, it stumbles on the consequences of what Hempel once referred to as the ‘alienation’ of a concept under study (Hempel 1952). By making the meaning of a term specific and precise we gain in clarity and applicability in particular contexts (e.g. a particular scientific theory) but—we add—we sever it from other contexts where the chosen ‘precisification’ just does not cut it. On the other side, if we want to make the chosen meaning applicable across the board, we need to add a proviso such that *depending on contexts* that very meaning gets qualified differently—for example, by referring back to Koskinen’s view, what counts as an ‘epistemic risk’ in a particular scientific practice or project (e.g. what type of error/s we are dealing with) might change depending on whether we are in the context of, say, a law proceeding, a journalistic inquiry, a scientific experiment, etc. So, to some extent, we are here back to listing.

There are certainly favourable cases where we can achieve objectivity in the ways suggested so far. If we want to decide, objectively, the length of a table, then measuring it is our feature of choice. And we all know how to measure it. It is trivial to ensure that the tape is accurate, that I have not been bribed to give a false reading, that we are using imperial not metric, that I minimise chances of falling into some form or other of epistemic error, and so on and so forth. Anyone who then disagrees that the table

is six feet long is not offering a possibly interesting variant opinion but is quickly to be left out of the discussion because they just don't understand what is meant by us when we say we are going to measure this table.

However, is the route that makes 'measuring' our proxy for objectivity equally objective? Ted Porter already in the 1990s showed for example that quantified procedures, intended to "convey results in a familiar, standardized form, or to explain how a piece of work was done in a way that can be understood far away", actually and conveniently hide "a multitude of complex events and transactions" (Porter 1995, p. ix). Their apparent objectivity is the result of strategies of manipulation and communication that make us reflect on the very objectivity of the processes that established quantification as a highly praised exemplar of objective reasoning (i.e. of rigour, neutrality, universality).

The route that makes a certain feature of objectivity eligible for choice, and what makes us choose it in a specific context, is froth with thick, complex, long-tailed arrangements of intervening factors, conditions, information, principles, data, assumptions, theories, decisions, etc. that sometime—if we are lucky enough to get the right combination—deliver a seemingly objective picture. Having chosen a precisification or made a selection from a list for the purposes at hand, one can thereafter make defensible claims to objectivity but will seldom be able to make the same kind of claim about the choices made to get there.

Nonetheless, what the two strategies detailed so far have in common is the idea that there is a way (or different ways) that objectivity can be thought of in the abstract (which does not mean without content), and that it is an idea that can be instantiated in context—and in enough contexts to justify the abstract case. But not only this idea is open to the objection that ultimately Objectivity does not admit of one clear definition (even a disjunctive one) that is appropriate in many or most contexts where we intend the term to do its work. It also prompts us to question the role played by the context or contexts of practice in the very formulation of the concept. Looking back at the two strategies analysed so far, the following possible roles of context seem to come to the fore

1. a testing ground for the general meaning of objectivity that has been picked out.
2. a source of connotations to be offered to concept precisification.
3. a device that secures content variation but only as far as the applications of the concept are concerned.

All these roles seem to assume that retaining generality for the concept of objectivity is key to understand what happens to it in particular frameworks. However, none makes room for an otherwise legitimate question: why not ask whether, and by means of what tools, contexts make it possible for objectivity to obtain in the first place? And related to this: can we think of the relation between objectivity and context in such a way that it does not necessarily and exclusively bring us to endorse either the type of complexity subscribed by the list strategy or the type of simplification promoted by the precisification strategy?

Of course, the relation between objectivity and context has been widely debated in the literature on objectivity—obvious examples being standpoint theory, or contextual

empiricism.<sup>3</sup> These discussions focus on the political and social contexts of knowledge production (particularly to endorse a subjective, perspectival stance on human knowledge) and on the role of contextual values in closing the gap between theory and evidence. And of course the socio-political dimension of the notion of context is of importance. But for the purpose of the present discussion I suggest that a more central question to pursue is how contexts work as mechanisms of meaning formation for the concept of objectivity, and how they provide the means to select out what is needed in specific circumstances for research to succeed in being objective.

In what follows I will attempt to show how a concept of objectivity plays a valuable role in research (natural and social) by articulating a notion of context that allows the concept to serve its useful task. I will start by taking some insight from recent literature in the philosophy of science: Hasok Chang has created a structured philosophical framework for describing and understanding research practices that I believe proves useful in identifying the epistemological backbone of a notion of context suitable to my project. In particular I share with Chang the view that evaluating the products and practices of science only makes sense relative to a choice of purposes to which they are to be put. And indeed purposes are never simple, as he claims, even the most straightforward-looking ones, nor are they necessarily just inherent to the very nature of the product or practice (e.g. the direct, intrinsic purpose of ‘match lighting’ is lighting a match, but there might be other, external purposes equally to consider). However, within Chang’s framework a central role is attributed to the notion of coherence, which is seen as responsible for the ‘hanging together’ of the various operations of some research practice in view of a certain aim, and ultimately for the success of the research practice itself. Instead, my analysis will show that when the aim of a research practice is securing objectivity (namely, securing that an aim is attended objectively) coherence, though still an important part of the practice, should be aptly integrated by (1) an idea of relevance, attributed (in manners to be qualified) to the intervening operations within that practice, and (2) a judgement of reliability, attributed to the operations included in the practice in view of delivering its aim. In order to show how relevance and reliability work in a revised Changean framework I will need to set up a series of preliminary steps. After introducing a description of Chang’s framework (Sect. 2), I will point out some of the limits of using coherence as the leading tool of successful practices (Sect. 3). I will then discuss (Sect. 4) how the idea of successfully pursuing the aim/s of a practice faces up to those limits, and suggest how limits can be averted by introducing reference to the notions of relevance and reliability of operations/activities. Finally (Sect. 5), I will use the so revised framework as a model to articulate an idea of context that accounts for the way in which objectivity takes shape in the circumstances of research. In so doing I will conclude by suggesting how, by comparison with both the complexity and the simplification outcomes of the two

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<sup>3</sup> Reference here is for example to Longino (1990), where the presence of background assumptions and values in the evaluation of hypotheses are seen as a tool for making objectivity dependent on publicly acknowledged and interactively shared constraints that secure critical scrutiny; to Crasnow (2013), where ‘location’ is used metaphorically to underline that knowledge is always situated (there is no view from nowhere) and comes from socially and politically situated knowers; and Wylie (2017), where well-functioning research communities are taken as exemplar of ‘situated epistemic agency’ which should proudly be the driving force in knowledge oriented activities (e.g. gender archaeology).

descriptive strategies outlined at the beginning of this paper, the contextual picture of objectivity supported in this paper might better serve the tasks of scientific research (including social research).

## 2 Contexts as systems of practice

The basic units of analysis in Chang's framework are what he calls 'epistemic activities' and 'systems of practice'. He points up that the core of these practices is not constituted by so called propositional knowledge but by all those activities (know-that and know-how) that make science happen, so to speak.

An epistemic activity is defined as a "more-or-less coherent set of mental or physical operations that are intended to contribute to the production or improvement of knowledge in a particular way, in accordance with some discernible rules (though the rules may be unarticulated)" (Chang 2012, p. 15). Typical epistemic activities include measurement, detection, prediction, hypothesis-testing, etc. (Chang 2017), but also more mundane activities, as we will see below, e.g. match lighting.

An important part of Chang's proposal is that activities can only be described in relation to "the aims that scientists are trying to achieve in each situation." The aim of an activity is what distinguishes an activity from mere physical happenings, namely it is what gives an activity its own "inherent purpose". Take as an example the activity of 'match-lighting': the intrinsic purpose of this activity is to get a match to light, and all the operations (mental and physical) performed within this activity are geared towards that purpose. To achieve the purpose, the activity relies on some rules governing the attempts to reach the aim, and on a "harmonious learning and adjustment between earlier and later instances of the activity" (Chang 2014, p. 72). However, inherent purposes are not the only aims activities pursue. There might be other, independent aims—-independent of the immediate reason why we engage in one particular type of activity—e.g. we want to light a candle because electricity went off, we want to set a forest on fire, or "we want to watch and admire the marvellous process that combustion is." (Chang 2014, p. 73).

This points out that epistemic activities do not happen in isolation. They rather occur in wider contexts (wider than what their inherent purpose requires), where they normally find themselves in relation with other activities, which include further intervening factors and reasons and skills, often directed towards aims other than their inherent ones. These wider contexts are so called 'systems of practice'.

A system of practice is defined as "a coherent set of epistemic activities performed with a view to achieve certain aims." (Chang 2012, p. 16). System aims are different from activity aims. They are identified as 'external functions' vis a vis inherent purposes. To use the previous example, burning down a forest or lighting a candle is the external function of the epistemic activity 'match lighting' and of all those other activities that might be involved in achieving that aim. Aims as external functions are what make different epistemic activities come together under the rubric of a system of practice where they can serve "more complex aims" (Chang 2014, p. 73).

The distinction between epistemic activities and systems of practice is not framed in reductivist terms—activities are not simpler components of more complex systems

(activities constituting systems might themselves be complex), and systems may be treated as single activities (forming part of yet larger systems) when their purpose is clear and well identified. The distinction is relative and context-dependent, just as the distinction between types of aim is not plainly a ‘simple vs complex’ one.<sup>4</sup> Either distinction though is helpful in envisaging the different levels and the range of perspectives from which we can look at a research practice and its aims.

Both in the definition of epistemic activity and in that of system of practice we find the adjective ‘coherent’. Coherence is indeed key to understanding how both operate in Chang’s framework, though it is no doubt a difficult concept to cash out. For a start, it goes well beyond a mere logical definition. It is indeed different from logical consistency, which might be used to signal lack of contradiction. ‘A is liquid’ is consistent with ‘A is not solid’, and inconsistent with ‘A is solid’. A set of sentences is consistent if they can all be true at the same time in a specified situation. However, this is of little help when it comes to describe the coherence of an epistemic activity. First of all, coherence does not concern only propositions (and therefore their truth function), but all those types of operations and practices that enter an activity and/or a system (some of which are not propositional). Secondly, coherence is to be defined in tandem with aims (that is why Chang refers to it sometimes as “pragmatic coherence”). It is the purpose of an activity, and the overall aims of a system, that define what it means for either an activity or a system to be coherent. Thirdly, coherence is described as a ‘hanging together’ of various operations within an activity, and of various activities within a system, that leads to a *successful* activity or system of practice.

By being so defined, coherence is on one side “the chief characteristic of a successful activity” (Chang 2017, p. 10)—in other words, if an activity is successful, then it is coherent. On the other side, we can echo, it is the chief characteristic of a successful system: if it is successful the activities it comprises cohere with each other. As in the case of epistemic activities, coherence of systems is a matter of more-or-less (never guaranteed that they are completely coherent). Chang calls it “functional coherence”, namely it is the result of an effective coordination of the external function(s) of the various activities brought into a system. In his own words “systems of practice are *crafted* in order to achieve certain aims which go beyond the inherent purposes of the activities that are pulled together to constitute the system” (Chang 2014, p. 74 my italics).

In general, coherence can be defined as a harmonious fitting-together of all those operations/activities that are conducive of a successful achievement of someone’s aims within a particular epistemic activity/system of practices. Harmony, no doubt (and by Chang’s own admission) is a metaphor. And so is ‘fitting together’. Any attempts to make either an explanatory notion ends up adding more and more synonyms to the list of metaphors without any palpable gain in literality: coordination, orchestration, concordance, back to coherence... So better in the end take harmony as a primitive

<sup>4</sup> “For example, organic combustion- analysis is a system of practice consisting of various other activities: burning the target substance; absorbing the combustion-products using other chemicals; weighing the resulting compounds with a balance; making percentage- calculations; and so on. But it can also be regarded as a unified epistemic activity with the inherent purpose of determining the composition of organic substances in terms of the relative abundance of oxygen, hydrogen, and carbon.” Chang, 2014, pp. 74–75.

and verifying its meaning vis a vis the activity intended to be achieved successfully (Chang 2017, p. 110).<sup>5</sup>

But is coherence really a primitive? Should it be treated as such in order to play its role effectively vis a vis successful activities and practices? To argue that this is not necessarily the case, and that coherence requires further conceptual grounding to become fully operational, I suggest testing this claim in the context of a practice that gives itself the aim of being objective. An example will pave the way.

### 3 Coherence in context

A tense public controversy in the UK concerning badger culling policy has been rolling on ferociously since the 1970s, that is since a badger infected with tuberculosis was found dead near a farm where an outburst of the disease among cattle had taken over—suggesting that badgers were responsible for the spread of infection among cattle. Different teams of scientists were brought into research on the matter, namely to *provide solid scientific evidence* about whether badgers were the main cause (or a significant cause) of infection, and to *make predictions* about the effect of culling them on the spread of the disease.<sup>6</sup> Where agreement among scientists took a turn to the worse was on matters of prediction. Disagreement crucially depended on differences regarding the evidence base, specifically on whether this was mounted by either excluding or including a host of contextual factors that potentially had a bearing on the formulation of the prediction itself. For one team of scientists it was basically the outcome of a 10-year experimental trial run on a selected number of badger settlements that could ground a prediction of success for cull policy in terms of containing/eradicating bovine tuberculosis. But for another team containing/eradicating bovine TB was to be treated as a ‘complex’ aim, entailing a number of objectives (consideration of the ‘perturbation effect’,<sup>7</sup> preservation of the ecosystem, economic sustainability, ethical sensitivity, etc.) each of which also entailing the implementation of a number of operations and activities—to use Chang’s terminology—grounded on a wide array of areas of intervention: genetic, epidemiological, ecological, animal behavioural and environmental studies of the problem economic, social, practical and animal welfare issues. All these areas were deemed purportedly critical to assessing the effectiveness of culling as a measure of TB control. It is the acknowledgement of this *sui generis*

<sup>5</sup> More recently, Chang explains coherence as what *makes sense* for us to do in view of achieving an aim (this is Chang’s ‘hermeneutic’ twist—his word—on his pragmatist view). But ‘making sense’ is not any more precise. Though it prevents coherence from being too tightly connected with success (not all coherent activities are successful), it is too broad for explaining what enters an activity to accomplish its aim. It might make sense, in some circumstances, to ‘spit on the match first for good luck’ to light it, and yet this activity might not achieve the aim.

<sup>6</sup> For a detailed description and analysis of the case see Montuschi (2017).

<sup>7</sup> This consists of a phenomenon of increased migration of badgers, including infected ones, from cull areas, bringing the disease to farms with no incidences of infected cattle. Badgers live in socially tight networks. Once the stability of these networks is ‘perturbed’ by a cull, movements of badgers increase and behavioral changes in badgers occur, making the situation volatile and unpredictable.



complexity that resulted in a far more sceptical prediction on the effectiveness of a cull policy by this second team of scientists.<sup>8</sup>

What was at stake was a double-edged prediction: first, whether an effective, coordinated and sustained badger culling could be delivered (successfully) second, whether culling could lead (again successfully, or with an at least appreciable degree of success) to disease containment/eradication.

Let's pause for a moment and try to assess the two predictions in terms of Chang's framework: take the first prediction to be the 'inherent purpose' of the activity 'badger culling', and the second its 'external function'. Two scenarios come to the fore.

### 3.1 Scenario 1

*Activity:* culling badgers.

*Aim/a:* number of operations (catching and killing techniques, combination of techniques, distribution of resources to variety of techniques etc.) aimed *to inherent purpose* (culling badgers)—if successful with respect to culling badgers, activity is coherent with respect to culling badgers, *ceteris paribus* and by learning and adjusting from previous instances.

*Aim/b:* number of operations aimed at *external functions* (e.g. reducing cattle TB) within a system of practice—here success of the activity cannot be used as a sign of coherence as the success of achieving Aim/b is to some extent independent, or as Chang says 'external', to the success of the activity and, the success of the activity (e.g. killing techniques etc. aimed at culling badgers) might not lead to the success of the aim/external function for reasons other than coherence.

Here is how we can summarise it

EA = epistemic activity (e.g. culling badgers).

x, y, z, ... = operations within EA (e.g. catching and killing techniques).

X, Y, Z, ... = EAs that form a system of practice (SP).

Aim/a = inherent purpose of EA.

Aim/b = external function of EAs in SP.

1. EA (x, y, z, ...) → culling badgers (= Aim/a).  
EA = coherent with inherent purpose.

Here success of EA appears to be a sign of coherence of EA.

2. SP (X, Y, Z, ...) → reducing cattle TB (= Aim/b).  
EA = coherent with external functions.

Here success of SP does not appear to be a sign of coherence of EA in SP (culling badgers does not necessarily secure success in reducing cattle TB).

<sup>8</sup> I am here referring to two particular reports, King et al. (2007) and Bourne (2007).

It seems that moving from 1–2 requires a more complex scenario. Culling badgers is not an isolated activity—even more so when its effectiveness is evaluated vis a vis serving a purpose external to the immediate one (badger culling). Going from culling badgers to reducing TB infection among cattle seems to point at a scenario of the type of the following.

### 3.2 Scenario 2

SP = EA1 (culling badgers) + EA2 (animal behaviour analysis) + EA3 (cost–benefit analysis) + EA4 (animal rights analysis) + EAn ...

Aim/a: number of successful activities *each inherently coherent* (or at least some/most of them).

Aim/b: number of successful activities coherently performed (or “*effectively coordinated*”) to achieve Aims/b—which means (1) each coherent with (some) others within the system and (2) all/most performed in view of reaching the aims of the system.

In a sketchy form

SP (X, Y, Z, ...) → reducing cattle TB.

X, Y, Z, ... → each inherently coherent each coordinated with others all coordinated to effectively reach Aims/b—‘more-or-less’.

Now, is the ‘coordination’ among activities (Scenario 2) the same as the ‘coherence’ of the operations within an activity (Scenario 1)? In both cases, Chang seems to think, they are thought of as an effective ‘working together’ of elements in view of achieving an aim.

But Aim/a and Aim/b are different, he states. Aims/b are, as we quoted above, “more complex aims.” As shown by Scenario 1 and 2, an inherently coherent activity might not by itself secure the successful achievement of an Aim/b, unless ‘coordinated with’ other inherently coherent activities. This might mean that coherence among activities means or implies something different or something more than what inherent coherence hints at.

## 4 Outplacing coherence

Does coherence (of operations within an activity, of activities within systems of practice) adequately assist in accounting for the successful achievement of the aim of both activities or practices, of both inherent and external aims? In lighting a match, to go back to one of Chang’s examples, I need to include, in coordinated mode, at least ‘holding a box with one hand’ and ‘scratching the rough edge of the box with the head of the matchstick’, but not ‘finger glued to the match head when the flame appears’ (I would not consider the activity of match lighting that successful if I burn my finger!). Or, ‘spitting on the match first for good luck’ might cohere with ‘scratching it on a

rough surface' and yet it is the second activity more likely to bring me to the aim (getting a flame), and coherence does not play a role in this. I rather need—I would argue—to select carefully among operations those that prove *relevant* to the aim, and choose those that I may *rely on*, to get me to the aim. Relevance gets established on the basis of a number of assumptions that account for why we rely on a particular activity. I might know (learn) from other activities (other than match lighting, e.g. scratching a dirty pan with a scourer) that if I'm too soft on a rough surface there will be no sufficient friction to get any effect going. So, I need to import knowledge and expertise from other activities where that very operation is used for other purposes and make it relevant to the new aim (I do not get a flame out of scratching a dirty pan, but I get friction which is relevant to lighting a match).

What I am trying to say is that successfully engaging with an aim might go well beyond what coherence as coordination accounts for. Or better, coherence might describe the working pattern of a successful activity on a given *presupposition of what is relevant* (having selected the operations that we have reasons to believe they will secure achieving an aim), and *what is reliable* (having selected operations that I have reasons to believe they will deliver the appropriate effect).

Relevance and reliability are not part of a definition of coherence as successful coordination. A is coherent with B, we are here told, means that they successfully 'hang together' in view of achieving C—whether A and B are operations within activities or activities within systems. They are *crafted* that way, we read above. But this does not account for how the 'crafting' is made possible (and which activities are deemed to work towards it) within a coherent activity or system of practice—coherence in the sense suggested does not offer such a description. I would then propose that coherence plays its role (beyond mere coordination) on the basis of what makes As and Bs *relevant* and *reliable* in view of achieving C (scratching a match head and not a scouring pad, or scratching a match head rather than banging it on the rough edge of a box or spitting on it for good luck, in view of getting a flame). Of course, picking irrelevant and unreliable As and Bs would automatically rule out success, but this is not due to lack of coherence per se, but precisely to having picked operations and activities that—for reasons to be specified—do not matter to the aim, and that we cannot take as having the resources (in principle and in practice) to matter in that sense.

So, how would a system of practice that emphasises relevance and reliability over coherence look like? First, let's see what kind of notion of relevance we are trying to accommodate in this framework.

Relevance is a relation—an X cannot be relevant in its own terms, it can only be relevant in relation to a Y. In the framework of a system of practice this means that it is an aim-oriented relation: by saying that X is relevant to Y we are saying that X is a suitable means to achieve Y (as its end)—'suitable' both in the sense of appropriate to purpose and satisfactory to achieve it. An RCT-based culling activity might be relevant to establish an accurate estimate of tuberculosis infection of cattle due to badgers (Aim/a) but not relevant to establish whether to cull badgers (Aim/b). To attribute relevance to the activity in view of the latter aim a whole range of questions, assumptions, factors and further activities are to be included. In the badger example we will find, as listed above, genetic, epidemiological, ecological and environmental studies economic

analyses (costs of eradication programmes versus available resources vs. benefits in terms of some public interest) studies of the feasibility of certain technologies of disease management assessment of the practical implementation of certain courses of action (the impact on the farming community and their rights vs. animal rights groups fighting for animals' interests, be they badgers or cows). To this we can also add considerations of values, ideologies, common sense views (cattle's welfare against badgers' protection, or people's dispositions towards valuing the preservation of the countryside), etc. etc.

That is why a relevance relation in this framework is not equivalent to logical implication. It is instead material and contextual. It is a material relation because it has to do with content—a lot of it—compacted and compressed in different ways, within and across activities. It is contextual because it can only be evaluated within circumstances and conditions of use.

Relevance is identified (“crafted”) in terms of assumptions, contextual factors, local information, and empirical assessments of how contextual information directs our attention to what matters in the circumstances, and of trade-offs between pursued ends and adopted means. A system of practice that, say, aims at reducing cattle tuberculosis might include, as its external functions, both healthier cattle and respect for badger settlements. In this sense aims in system of practices are ‘complex’, in that they might push in different, sometimes incompatible directions, making coordination (or coherence) difficult to pull off. To serve such complexity, carefully selected activities that might prove relevant to achieve a variety of aims, not always in agreement with each other, is the primary step. Culling badgers might not cohere with economic costs of culling or with animal welfare analysis, but they might all be relevant to achieving the aim (containing/eradicating cattle tuberculosis). I suppose a system of practice is a bit like a black box. When we look into the box, coherence is the mechanism that ensures an output of success only if it operates on relevant and reliable activities. But relevance and reliability bring with them, and into the box, a dense, tangled variety of assumptions and assessments, and contextual, often long-tailed, information that goes well beyond what coherence is capable to account for.<sup>9</sup>

I have not said much about reliability—other than hinting that the relevance of an X to a certain aim must include that we can count on X to deliver the aim (we might believe that spitting on a match stick for good luck is relevant to trigger a flame, but we cannot rely on it). Reliability is the form that a belief takes once based on well supported reasons. Support comes from a network of interrelated practices that include the right mix of features: it must include a good number of well-established and diverse practices, and practices should be connected, with each other and sometimes with practices far away from the immediate context of reference, in a variety of ways (coherence, but also constraint, support, convergence, even disagreement). This once more shows that the success of a system of practice must rely on a wide, dense, far reaching mesh that resort to coherence can only presuppose.

So back to our question above: how would a system of practice that emphasises relevance and reliability over coherence look like? It is a contextual framework that

<sup>9</sup> Also of course, we should add, the relevance and reliability of As and Bs—just like coherence—are relative to the context provided by the system of practice and from which they operate. More on this later.

on a well-grounded selection of aims to be served in some circumstances settles what practices are relevant to achieving these aims. And supposing, as one must, that we ought to be also sufficiently justified in choosing these practices, the same framework should provide whatever material is needed for such justification. The success of the system (its ‘harmonious working together’) is a function of these choices being effectively put in place.

## 5 Where objectivity comes in and finds its context

Let’s take stock. I started by contrasting two descriptive strategies for the concept of objectivity and suggested that neither pays adequate attention to a relation between objectivity and context that focuses on the *sui generis* constructive role of the latter *vis a vis* objectivity. Arguing for the centrality of contexts of practice in achieving objectivity calls for a careful description of what these contexts consist of and, most importantly, how they work. The pragmatic notion of a system of practice described in Sect. 3 of this paper focuses on the coherence of activities (and operations within activities) constituting a system, which jointly (namely, ‘harmoniously’ and ‘effectively’) lead to the achievement of the aim(s) of a system. Aims, coherence and success are firmly interrelated in this framework. I suggested that success can link back to coherence only presupposing that only activities and operations relevant and reliable to an aim are picked out. These are a preliminary condition for coherence to succeed, among other things.

Especially in the case of the complex aims of systems of practice, when various external functions come together within the system, it is hard to see what it means to have ‘successfully’ reached the aim. In the badger case, we can indeed say whether the activity ‘culling badgers’ has been successful in culling badgers (within a characterization of ‘culling’ that satisfies the context), but it is more difficult to say whether such an activity is successful *vis a vis* an external function such as eradicating cattle tuberculosis. Here the *sui generis* complexity of the aim requires an equally complex system of practice which includes different activities (culling, vaccinating, changing farming practices, etc..) and different aims (eradicating cattle tuberculosis, preserving ecosystems, respecting animal behaviour and animal welfare, etc.). Success formulated in terms of coherence does not allow us to bring forward a central question that relevance is instead able to accentuate: considering whether we have ‘confined our attention to what matters’ in the circumstances.<sup>10</sup> Or better, we can claim that the (degree of) success of a system of practice measures up to what the aim of the system in question requires us to pay attention to (or points us towards).

How does all this matter to objectivity—or at least to the concept which the argument developed in this paper is striving to bring out?

Let’s remind ourselves that objectivity in the sense of either the list strategy or the ‘precisification’ strategy lays itself open to either the objection that too much of it (lists of definitions and/or connotations) ends up in loose and ultimately useless definitions, or the criticism that too little of it (narrow definition) does not do justice to the scope of

<sup>10</sup> I take this expression from Cartwright (2011), pp. 16–17.

potentially irreducible connotations of the concept. Intimating that we can escape both looseness or narrowness by resorting to ‘context’ as a way of testing what happens of the general idea in specific circumstances still does not explain how context is that very notion that allows us to show how objectivity can be achieved, or can be ascribed as a meaningful connotation to the results of a research practice. To be able to do this we ought to look at the relation between objectivity and context in a different direction of analysis from the one hinted at by the two strategies described at the beginning of this paper. We should not try to find how a generally defined concept of objectivity can be applied in a particular context, or be tested by such context. We should rather identify the particular ways in which contexts operate in order to substantiate what objectivity means in the context at hand.

Now, systems of practice in the reformulation that I have put forward in Sect. 4 provide, I believe, a picture of context suitable to understand what objectivity amounts to, when this is set out as one of the aims of one such system. According to this picture a context allows on one side, to settle on what purposes to pick out (across the inherent/external divide) in order to be objective on the other side, to choose what practices are relevant (and reliably so) in order to achieve them. Back to our example, how does the aim of reducing cattle tuberculosis be portrayed such that we are confident that we are dealing with an objectively set out aim? What qualifies the research practices undertaken to achieve that aim as constituting an objective system of practice?

Spelt out more in detail, the questions that a context is to provide an answer to are of the following types: (1) what aims should the project serve? (2) what practices are relevant to achieving those aims in the circumstances? (3) what enters a judgement about what are relevant aims and what practices are relevant to achieving them? In our example, we proceed by asking ourselves: have I considered the aim of reducing bovine tuberculosis vis a vis respecting animal welfare, and have I considered culling badgers, making cattle healthier and preserving the ecosystem jointly, and for what reasons – scientific, political, moral? (question 1). And given the aims, what practices allow me to take badger behaviour into account in such a way that it does not interfere with culling? How relevant are the results of a ten-year badger RCT in achieving that? What practices best calculate costs and benefits of culling? How do I best assess the consequences of culling on the ecosystem? etc. etc. (question 2). Here we are not just compiling a list of factors that matter in principle. We are assessing their relevance in practice guided by the aim(s) of the context.

In order to answer type (1) and type (2) question above, appropriately a context should include (a) enough Information about the wider cultural/social/political/economic setting and its norms and customs sufficient to constrain internal and external purposes, and (b) facts about the setting that constrain what practices can achieve the purposes that should be served in that setting.

To answer type (3) question above, context should also include an epistemic background that provides assumptions sufficient to support the relevance of the purposes and of practices to the purposes (what we hinted at before, by saying that we ought to rely on well-rehearsed and accountable justifications for the choices being made). This is what makes relevance ultimately a judgement, built by argument on the basis of the facts, the norms, and the assumptions made available by a context.

Arguably, ‘drawing attention to what matters’ regarding both aims and practices is what is at stake when we ask ourselves: ‘have we been objective’ in the circumstances (and/or *ceteris paribus*)? The number and types of factors to take as relevant and reliable in order to pursue the aim(s) objectively in the circumstances are open ended (in principle) but because of that not loosely defined (as they are constrained by context and its aims).

We should not mistake resorting to relevance as yet another search for a standard or a benchmark of objectivity (a way to describe what ‘to be objective’ means in abstract terms). In fact, we should stop worrying about finding such a general concept of objectivity and then trying normatively to apply it in practice. Appealing to relevance brings us to a reversed project: we look at what ‘aiming at objectivity’ means starting from practice—there is only objectivity in the concrete context of a research process. Meaningful objectivity can only be *found* in such contexts, and our guides to discovery are our choices of relevance, the reliance on activities and operations we have reasons (theoretical and practical) to believe they can deliver results regarding the aim/s of a research practice, and finally the ‘hanging together’ of relevant and reliable elements in a system that so sanctions its success (meets its aims). A contextual pursuit of objectivity in the way suggested in this paper frees us from the bogus alternative of adopting a broad but generic vs. a narrow but ‘alienated’ concept, neither of which could be used as a useful regulative ideal for research as this takes place in actual practice.

Of course, who/what decides what is relevant in specific contexts, and in what ways complex, dense, long-tailed contexts of practice make for reliability, require an extension of the argument that can only be kept for another time.<sup>11</sup> But on the basis of what I did include in the discussion up to this point we can at least envisage what lesson can be drawn for thinking of the objectivity of research practice (both natural and social) in the way suggested here: it is the relation between objectivity and context that is crucial in fixing a meaning of objectivity that works in (and for) the practice of research. In order to understand what this relation entails we ought to start from a careful identification of the descriptive tools which make a piece of research a well-functioning, aim-sensitive context of practice, and allow objectivity to become an achievable result given the circumstances set out within each different context.

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<sup>11</sup> It will be addressed in the forthcoming OUP multi-authored book ‘The Tangle of Science. Reliability Beyond the Scientific Method, Rigour and Objectivity’.

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