

Predicate or subject?

Assorted notes on the metaphysical notion of ‘sharing’

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‘That which religion makes the *predicate* we always
just have to make the *subject*, and what it makes a *subject*
we must make a *predicate*,
thus inverting the *oracles* of religion’

Feuerbach: *Das Wesen des Christentums*, 1841, §I:v

In CSCW, phrases such as ‘shared goal’ or ‘shared understanding’ are often used to denote what is taken to be a defining feature of cooperative work or at least what is thought to be an essential precondition of the orderliness without which cooperative work in practice is impossible; that is, these terms are used in an explanatory function [e.g., 1; 6].

To take but one example: In one of her articles on ‘situation awareness’ the much-cited Mica Endsley posits: ‘In a smoothly functioning team, each team member shares a common understanding of what is happening on those [Situation Awareness] elements that are common — that is, they have *shared situation awareness*, which refers to the overlap among the SA requirements of the team members.’ However, she prudently adds, ‘The concept of shared mental models is not universally heralded’ and ‘The development of shared mental models has not been the subject of much research’ [4, pp. 48, 52 f.].

A ‘shared situation awareness’? A ‘shared mental model’? What does she *mean*?

1. On the different grammars of the notion of ‘shared’

In CSCW and neighboring areas, the phenomena under study — collaboration, cooperative work practices, use situations, user preferences — are constituted in and through actually unfolding ordinary social life and are thus invariably defined in terms of ordinary language: in terms of ordinary-language concepts such as ‘goal’, ‘task’, ‘knowledge’, ‘skill’, ‘division of labor’, ‘coordination’, ‘organization’, ‘practice’, and so on and so forth. The same applies to the notion of ‘shared goal’, ‘shared understanding’, ‘shared knowledge’, etc. Before we embark on a discussion of

‘sharedness’, it is advisable, therefore, to consider the ways in which we use the term ‘shared’.

The verb ‘to share’ (and the adjective ‘shared’) is used in a bewildering range of ways. What we have is a widely ramified family of metaphors that, well, share the same word and have been derived from the old Germanic word for partitioning and for the result of partitioning: *a share*, as in ‘shear’, to cut through (cf. ‘plowshare’: the implement that divides the soil).

Thus, to ‘share’ may simply mean to divide or partition a thing into discrete parts for separate consumption or appropriation. One shares a six-pack of beer or a chocolate cake by dividing it into portions and handing them out. One can also, in a related sense, buy ‘shares’ in a company and then be entitled to receive a ‘share’ of the company’s profit: a ‘dividend’ (from the Latin verb *dividere*, force apart). However, the term may also be used to express that multiple persons have *de facto* access to a resource. We all ‘share’ the planet and its atmosphere (although some obviously are ‘more equal than others’). But it is also sometimes to denote *legitimate* access: the door is open, feel at home, help yourself. It may also be used to refer to tools and materials that are available to workers at a workplace in the sense that they can freely use these resources while at work, but it would be considered illegal if they were to remove the resources from the premises. In a somewhat similar way, the phrase ‘sharing a fridge’ is used to express that multiple persons can legitimately access and consume the provisions held in the fridge: ‘shared’ here is used to denote rights in terms of property or possession. By contrast, the phrase ‘a shared bed’ does not (in a civilized world) express that occupants are at liberty to divert themselves with the other occupants. What is shared here is *not the content* but the horizontal sleeping facility as furnished with mattress and duvets, whereas in the case of the fridge it *is* the content that is ‘shared’ and not merely the fridge as a cooling facility. Sharing a six-pack or a cake is quite different from the ‘sharing’ of a fridge or a bed or a planet: the shared cake and six-pack and the shareholder dividend are no longer there after having been ‘shared’, whereas the shared planet and its atmosphere as well as the fridge and the bed are still there afterwards (although the planet may begin to look worn and the contents of fridge and bed may have vanished the next day).

The term ‘shared’ is also used in a quite different domain of discourse or ‘language game’. For example, when participants at a design meeting, after a lengthy discussion about some open design issues, at the end of the meeting agree on a proposed solution and action plan, they might refer to what has been achieved as a ‘shared understanding’ of what to do now. What they mean by that is (a) that they are all committed: they have had their say and can be justifiably held accountable; and (b) that they are supposed to know what to do without having yet another meeting and if they do not know, then it is because they have not paid attention at the meeting. That is, the issue is closed; there is no serious doubt or uncertainty. A ‘shared understanding’ here simply means: it is unproblematic to proceed.

We talk about ‘a shared goal’ or ‘a shared language’ or ‘shared information’ or ‘shared knowledge’ in much the same way. Thus ‘a shared goal’ is one that has been negotiated, articulated, and agreed upon so that everybody can go on with their individual tasks while taking for granted that the others will do likewise. We say that we have a ‘shared language’ when we can engage in conversation and exchange emails and read scholarly articles without incessantly having to guess what is being said or

ask for clarification or explanation. We can similarly ‘share’ information in the sense that we disclose what we have heard or seen in a such a way that all those to whom it has been disseminated can be presumed to be aware of it, and if somebody then is not aware of it, then that somebody can be considered negligent or plain dumb. We can also be said to ‘share’ a body of knowledge when we can safely presume, for instance from the fact that others have taken the same academic degree or belong to the same profession, that the others understand the background of a statement, the implications of some issue, or are able to perform relevant tasks, and so on. In these language games, ‘sharing’ is not about partitioning a thing such as a cake or profit or about granting others rightful access to resources such as tool magazines, fridges, or beds. When talking about ‘shared goals’ and so on, we are rather expressing our confidence that action will be performed in an orderly way without need for further negotiation, clarification, explanation, etc. It means: proceed as normal. It is an expression of what Alfred Schutz refers to when he talks about the practitioner’s ‘natural attitude’ [15; 16].

That is, ‘sharedness’ is not a researchable phenomenon; it is not even a phenomenon. It is a widely ramified family of metaphors. In usages such as ‘to share a cake’, the sense of partitioning by cutting is retained: we ‘shear’ it to ‘share’ it. But when using the term ‘share’ in the case of ‘a shared goal’ or ‘a shared understanding’, nothing is ‘shorn’, and we have left behind the original metaphor of cutting through; it is now *commonality* that is stressed: joint possession (‘shared fridge’) or common predicates (‘shared view’, ‘shared habit’).

In ordinary usage, the different uses of the term ‘shared’ in domains of discourse as different as those of ‘shared beds’ or ‘shared goals’ do not pose a problem at all. The problem emerges as soon as we talk about ‘sharing’ outside of the practical contexts of ordinary life from which the notion is derived. Then the notion of a ‘shared goal’ suddenly becomes assimilated to the notion of a ‘shared resource’: something that exists *out there* as some powerful but hidden faculty that enables us to conduct our business in an orderly manner. We then slip from making sense to doing metaphysics.

2. ‘Shared {x}’, or *Deus ex machina*

It is easily observable that people in ordinary work settings coordinate their work in a way that generally is both orderly and effortless. In fact, it is a trivial observation, for if we did not conduct our work in an orderly manner, we would all quickly starve to death. Now, to account for this observation, Mica Endsley and others deploy constructs such as ‘common understanding’, ‘shared situation awareness’, ‘shared mental models’ and similar. These constructs are not merely used descriptively; they are submitted as *explanations* for the observed orderliness: the observable ‘smoothly functioning team’. They are, in other words, submitted as theoretical constructs: notional entities or mechanisms that somehow engender orderliness: they exist or have to be established as preconditions of orderliness.

Of course, there is, in principle, nothing wrong with theoretical constructs to account for observable phenomena. But their introduction requires a modicum of caution and circumspect. A theoretical construct should account for the emergence of the

observed events: Under which conditions are the events likely to occur and under which are they unlikely to occur? The theoretical construct should tell us how we in practice can ascertain whether or not what is being asserted is actually the case. And the theoretical construct should relate to other theoretical constructs in accountable ways (mechanisms and processes; techniques, procedures, and methods; costs in terms of resources, time, and effort; collective and individual interests and motives). The very fact that two things have the same predicate is — in and of itself — inconsequential. We may observe a regular pattern of behavior, but it does not explain anything until we understand what generates the regularity of the pattern. In itself, the pattern is just a pattern: it explains nothing.

In what way are notions such as ‘shared goal’, ‘shared understanding’, ‘shared mental model’: in short ‘shared {x}’, supposed to explain the observed orderliness of cooperative work? Where does the ‘shared {x}’ reside? How does it work? Does it work like a remote system call, with remote execution of a program or by downloading an instance of a program from some virtual server? Or is it more like a distributed system of interacting programs? If so, how do these client programs become updated and how do they communicate? Behind the backs of the workers, like the infamous idea of an ‘invisible hand’?

How do we determine that A and B in their cooperative effort have ‘a shared understanding’ (or ‘shared goal’ or ‘shared knowledge’ or whatever)? The short answer is that the only method available is that of observing whether they in fact do manage to conduct themselves in an orderly fashion and accomplish what they are supposed to accomplish with the resources available. But that is exactly what should be *explained!* To say that their ability to cooperate is due to their ‘shared understanding’ is merely substituting one expression of the *explanandum* for another and then to offer *that* as the *explanans*. It is like explaining that a man behaves cleverly by referring to his ‘intelligence’ or that certain people conduct themselves in a certain way *because* of their ‘culture’. Substituting one description of the phenomenon to be explained for another description is not an explanation. For an explanation to have scientific merit, it must be possible to investigate the *explanans* independently of the *explanandum*.

If a ‘shared understanding’ or something similar is required for orderly performed cooperative work to be possible, which conclusions can then be inferred from situations of failure, cock-up, breakdown, etc.? That the workers did not have ‘a shared understanding’ after all? But if they later the same day, after lunch, say, perform in their usual smooth way, would that then mean that the ‘shared understanding’ for some reason was temporarily absent, like a transient power failure? Similarly, does the fact that a misunderstanding occurs in a given conversation indicate that the interlocutors did not have a ‘shared language’ after all, or just that they, well, misunderstood each other? As an explanatory construct, the invocation of some presumed ‘shared’ mental entity is vacuous. Worse, it makes us stop our studies before we even began!

There is, to reiterate, no harm in talking about ‘shared goals’, ‘shared knowledge’ in daily discourse; nor is there anything wrong with theoretical constructs to account for observable phenomena. The problem is that notions such as that of ‘shared mental models’, introduced as theoretical constructs to do the work of explaining what is easily observed, are vacuous; they cannot be independently identified. The presumption that some ‘shared’ construct (‘goal’, ‘understanding’, etc.) is a prerequisite for

cooperative work introduces an occult agency that is somehow supposed to generate what we observe. What is suggested is a hidden mental medium or facility that somehow — in the mysterious way of Mesmer’s ‘magnétisme animal’ — unites or integrates individual minds behind the backs of the individuals. Here the ‘sharedness’ discourse spills over into parapsychology.¹

3. ‘Group fetishism’, or managerialist ideology

Why would — otherwise often quite sophisticated — scholars entertain or adopt an obviously metaphysical notion such as that of ‘shared {x}’ to account for the orderly alignment of cooperative work? One explanation would be that conceiving of cooperative work as constituted by ‘a shared goal’ (or as premised on a ‘shared understanding’ and so on) is a variant of managerialist ideology: it is a conception that blankly ignores the realities of modern work places: factories and hospitals, construction sites and research laboratories, for cooperative work is overwhelmingly characterized by advanced division of labor, systematic specialization, distributed decision making, etc. and often also by competition for resources and promotion, incongruent or divergent interests, and even conflictual relations.

Consider the heterogeneous array of actors involved in, say, the construction of a modern building: there are the architects, of course, but also the structural engineers called in as consultants; there are the workers on the site: navvies, steelworkers, bricklayers, glass and sheetrock façade specialists, plumbers, electricians, carpenters, painters; but also the truck drivers bringing in materials and components and removing waste, and, further out in the network, factory workers preparing building elements etc. And then, of course, there are finance consultants of the client, and the lawyers and the bookkeepers of the different parties, and so on. The different parties to a construction project have local goals and concerns and in many cases the interests of one actor are best served at the detriment of another. The weekly meeting is a continual haggle over cost and schedule and priority.

As Karl Sabbagh expresses it in his rich account of the design and construction of the Worldwide Plaza tower in Manhattan: ‘Each person working on Worldwide Plaza had a different goal: for a bricklayer, during 1987, to see the gleaming, soft-beige-and-rose expanse of crisply laid brick reach up to six hundred feet; for a steel fabrica-

¹ Cf. Mesmer’s propositions: ‘1. A responsive influence exists between the heavenly bodies, the earth, and animated bodies. 2. A fluid universally diffused, so continuous as not to admit of a vacuum, incomparably subtle, and naturally susceptible of receiving, propagating, and communicating all motor disturbances, is the means of this influence. 3. This reciprocal action is subject to mechanical laws, with which we are not as yet acquainted. [...] 7. The properties of matter and of organic substance depend on this action. 8. The animal body experiences the alternative effects of this agent, and is directly affected by its insinuation into the substance of the nerves. [...] 11. The action and virtue of animal magnetism, thus characterized, may be communicated to other animate or inanimate bodies. Both of these classes of bodies, however, vary in their susceptibility. [...] 13. This action and virtue may be strengthened and diffused by such bodies. 14. Its action takes place at a remote distance, without the aid of any intermediary substance. [...]’ [translated in 2, pp. 5-8; 9, pp. 74-83].

tor in Houston, to see nineteen thousand tons of steel erected into a soaring framework of complex ellipses and sturdy rectangles; and for the developers, to see an investment that would transform the West Side of New York, and bring profits for decades to come.’ ‘Linked to any major construction project are men and women with every type of personality, intellect, and qualification. Scientists and engineers, welders and electricians, artists and writers, salesmen and real-estate brokers, accountants and bankers, canteen managers and dynamite experts, seismologists and calligraphers — all feeling entitled to think of a building as “their” building in the same way as the architect or the principal developer. This possessiveness can be a driving force behind each craftsman and his task. It can lead to the excitement of competition, as the mason, the waterproofer, and the window installer will the steel erector to complete *his* stage in the building to make *their* work possible.’ [12, pp. 1-3].

Saying that these actors have the ‘shared goal’ of making the building happen is akin to saying that the opposing sides in a war have the ‘shared goal’ of winning.

There are, of course, cooperative work arrangements at a smaller scale than that of constructing a 50-story and 237 m tall office tower. There are also ‘teams’, ‘working groups’, ‘projects’, etc., but these organizational forms are immersed in and penetrated by relations of organized division of labor etc., with team members representing different skills, professions, organizational units, even different firms or institutions. The very notion of ‘a group’ is ‘murky’ [13]. Louis Bucciarelli, for example, in his ethnographic study of the design of a cargo X-ray inspection system, found that, by the end of the day, when the design had been accomplished, no ‘synthesis’ of the ‘concerns’ of the different project participants had been achieved, and none was attempted either:

‘One party concluded that the addition would significantly reduce scatter, the other that it could be designed and fabricated at a reasonable cost without undue pressure on anyone’s schedule. Even though the ‘trade-off’, if we can even call it that, was weakly constructed since the marginal cost appeared small relative to the overall budget and because the reduction in scatter appeared to be quite significant, still one might imagine a more rational, instrumental procedure to bring these two perspectives into play. This, however, would require considerable additional effort in order to eliminate uncertainties, elaborate possible actions and outcomes, obtain better cost estimates. It certainly would require more time. [¶] This was not done. *Participants in effect made a decision not to seek such a synthesis in their decision-making. The cost was not worth it.* Design decision in this instance is best seen as an overlay of interests rather than their synthesis within some flat, cognitive domain.’ [3, p. 167. — Emphasis added.]

The discourse of ‘sharedness’ is predicated on a romantic myth of ‘teams’, what the great German sociologists Heinrich Popitz and Hans-Paul Bahrtdt called ‘group fetishism’ [11]. It is a notion that implicitly restricts the scope of CSCW to ‘teamwork’ and the like (and sometimes even explicitly, e.g., by Jonathan Grudin [7; 8]). This means that coordination technologies that generally transcend ‘groups’ and ‘teams’ — document management systems, production planning and control systems, medical record systems, and so on — are *a priori* excluded from consideration. From a practical and economic point of view, this is preposterous. But it has detrimental effects also from a technical perspective. Systems specifically designed for ‘groups’ generally fail, for groups intersect and their boundaries are typically vague and inde-

terminate and shifting. Facebook, for instance, is designed on the premise that groups are discrete and relatively stable entities. But that design premise does not hold up. When commenting on a particular posting in Facebook, ‘I’ do not know which of my ‘friends’, distributed as they typically are over multiple social contexts, can see what ‘I’ am commenting on. The interpretation of ‘group’ as a ‘set’, underlying this and other implementations of ‘groupware’, is fallacious. The WISIWYS principle is violated. Designing technologies for real-world cooperative work is a far greater challenge than designing systems for well-bounded ‘groups’: *the general condition is the inherently distributed nature of cooperative work.*

4. Mere regularity and normativity

Another explanation for why the obviously metaphysical notion of ‘shared {x}’ is so persistent would be that it seems to be the long-term effect of behaviorism and, by implication, cognitivism. For in their (different) accounts of social phenomena, both behaviorism and cognitivism consistently reduce normative conduct or ‘rule following’ to ‘mere regularity’.

When finding that various occurrences correlate, what we observe is ‘mere regularity’. We do that, for example, when we find that the frequency of suicide varies fairly consistently with certain life situation characteristics (age, chronic illness, depression). On the other hand, when we find that actors give and receive instructions on how to conduct themselves in a certain line of activity and correct themselves and accept corrections and sanctions with respect to their conduct, then we are observing something more than *mere regularity* in behavior; we are observing instances of *rule-following*: normative conduct, *practices*. In the first case, the terms in which we account for the observed regularity do not have to be internal to the ‘form of life’ under investigation; in the latter case, in studying normative conduct, practices, the terms in which we account for the observed conduct have to be internal to the ‘form of life’, for they are *the rules that constitute the practice* [17].

The orderly alignment of interdependent and yet distributed activities can be described behavioristically in terms of mere regularity: as the observable regularity of the activities of a multitude of individuals: when A behaves this way, B generally behaves that way, and so on. At this point the two schools parted company. While behaviorism stayed put, restricting itself to observable behavior described in physical or physiological terms (and withered away), cognitivism indulged in unrestrained speculations about what might bring such orderliness about and came up with mentalist constructs such as, e.g., ‘plans’ understood as hierarchically organized programs that causally regulate the behavior of an organism [10]. Despite all the differences, what nonetheless unites the two schools is that normative conduct (‘rule following’) is *ab initio* excluded from the accounts. As a result, neither school is able to study *practices* and *a fortiori* coordinative practices.

Now, how do we in terms of coordinative practices explain the remarkable orderliness of cooperative work?² In his *Philosophical Investigations* [18], Ludwig Wittgen-

² For a more elaborate discussion, cf. [14, Chapter 12].

stein lets his fictional interlocutor ask the same question: ‘How am I able to obey a rule?’. Wittgenstein’s answer is quite relevant here: ‘If this is not a question about causes, then it is about the justification for my acting in *this* way in complying with the rule. [¶] Once I have exhausted the justifications, I have reached bedrock, and my spade is turned. Then I am inclined to say: “This is simply what I do.”’ (§ 217). If the question ‘How am I able to obey a rule?’ is about *causes*, however, then the answer is simply that ‘We are trained to do so; we react to an order in a particular way’ (§ 206).

That is, to give a *causal* account of the orderliness of cooperative work, we would have to look at how actors have been educated and trained and how their coordinative practices have evolved in a protracted process of learning from experience or from paradigms. On the other hand, ‘To follow a rule, to make a report, to give an order, to play a game of chess, are *customs* (usages, institutions)’; it means mastering a ‘technique’ and is thus ‘a practice’ (§§ 199, 202). That is, to give an account of the orderliness of cooperative work in terms of *complying with the rules*, we have to investigate the ways in which rules are expressed, conveyed, and materialized in the setting and the setting’s infrastructures and furnishings: the ‘techniques’, that is, the coordinative practices and the concomitant artifacts and protocols.

5. Achieving ‘sharedness’, or simply: *coordinative practices*

Reference to a ‘shared goal’ or some ‘shared understanding’ does not *explain* the orderliness of cooperative work; the notion of ‘shared {*x*’ leaves the critical questions unanswered: *How* is the ‘shared {*x*’, as presumptively displayed in observably concerted action, *actually* achieved? *How* do actors actually align and mesh their distributed activities? ‘Shared goals’ and ‘shared understanding’ etc. do not explain orderliness; they are just other — but Mesmerizing — words for the orderliness that is achieved through coordinative practices.

Coordinative practices are not postulated theoretical entities for which there is no independent evidence nor theoretical justification. They are robustly observable:

- in the ways actors consult, apply, discuss, cite, violate, etc. job descriptions, rules of procurement, standard operating procedures, routines, plans, schedules, classification systems, notations in justifying or sanctioning particular actions or omissions of action;
- in the ways actors look at, react to, display, gesture at, point at, make annotations on representational and coordinative artifacts of all sorts: process control screens, blueprints, sketches, issue lists, time tables, forms, etc.;
- in the ways actors state, refer to, hypothesize, discuss, etc. the causal relationships of the material work setting, the production processes and operational constraints, the behavior of machine systems, means-end relationships, temporal and spatial constraints and affordances, etc.;
- in the ways actors monitor for specific cues in the conduct of colleagues and in the behavior of the work setting in general and align their individual activities accordingly and in which they refer to such cues in justifying or sanctioning particular actions or omissions of action;

- in the ways actors express, debate, invoke, etc. professional concerns, ethical standards, priorities, diagnostic strategies, conceptual schemes, etc..

In contrast to the notion of ‘shared $\{x\}$ ’, coordinative practices are as observable as electromagnetic fields. We can observe and determine the normative make-up of practices (‘rules’) when actors sometimes excuse particular actions (‘Sorry, my mistake!’), sanction the actions of colleagues (‘You are supposed to deliver this part at my workstation’), instruct novices (‘This is how we do it here’) or ask for guidance (‘Where do I deliver this part, when I’m done?’).

6. In conclusion

Let me end these notes as I began, by bringing Feuerbach’s methodological recommendations to mind: ‘Therefore — this is the moral of the fable — we should not, as in theology and speculative philosophy, turn the characteristics and forces of reality, *i.e.*, real beings and things, into arbitrary signs, into vehicles, symbols, or predicates of a — from them — distinctly different, transcendent, absolute, *i.e.*, abstract being. We should rather take and understand them in the significance which they have in themselves, which is identical with their quality, with the characteristics that make them what they are — only then do we have the key to an *actual theory and practice*.’ [5, pp. 21 f.].³

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³ The quoted passage is from the Preface to the 2nd edition from 1843.

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