**Participant comprehension and qualitative observation methodologies (Methods in Action)**

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**Abstract**

I discuss the different outlooks on ‘observation’ that are most commonly found in social science quantitative methodology by analysing the methodological approach that supported my four-year PhD project on the sociology of theoretical physics. I highlight how my pre-existing immersion into the social world of theoretical physics was the key element in allowing me to describe the sociology of the theoretical ‘thinking science’ subculture in a field where ‘observation’ cannot be carried out in a typical way.

**Learning outcomes**

* To understand the classic approaches to observation in the social sciences.
* To identify the roles of immersion and interaction in participatory approaches.
* To locate the strengths, weaknesses and applicability of highly- participatory and comprehension approaches.

**Introduction**

This paper is centred on my three-year long PhD research project, an empirical, qualitative, micro-sociological analysis of the theoretical physics culture. My work was carried out in the tradition of the field known as Science and Technology Studies (STS) where observational studies of scientific practice have been fundamentally important to the development of the discipline. I will start out by spelling out the different approaches to ‘observation’ that are most commonly discussed in qualitative social science and will use this analysis to explain why in my own project I relied on a different twist on ‘observation’.

Although my project’s final empirical research consisted almost entirely of interview material I will show how, more than the interviews themselves, it was a combination of a ‘complete-participant’ approach to observation that together with a reflexive process, allowed me to realise the project.

STS is a research programme that holds keen interest in studying scientific communities as cultural entities. An archetypal research line in STS has been the ‘laboratory studies’ approach, in which social scientists travel to a scientific laboratory and analyse the communities who inhabit it, in order to describe the practices that constitute scientific communities and so observation issues are methodologically important.

Practice is central to laboratory studies because the science in empirical research sites involves a lot of ‘doing’: physicists connecting wires when working on novel laser technologies, paleoceanographers sorting through deep sea mud samples, etc. The lab is a rich place for the social scientist to *observe events* *and processes* that themselves anchored on sociologically rich scientific cultures.

At first, lab scientist’s actions will make little sense to a social scientist. After all, it takes years of apprenticeship for a science student, already trained in a science, to achieve proficiency in a lab culture. Unsurprisingly, when the social scientist first enters a lab the situation may not be too different from that of the anthropologist trying to make sense of the actions carried out by a Pacific island shaman performing a magic ritual.

**Social science and the natural sciences**

The social scientist’s deep detachment from the lived, daily world of the experimental natural scientist is actually one of the reasons why social scientists were so enthusiastic about studying laboratory life in the first place. There is a lot of interesting social science to write in trying to link scientist’ conceptual, cultural and linguistic worlds to the actions carried out in the lab. Again, this is not very different to why an anthropologist would be interested in making sense of the shaman’s actions by linking it to the conceptual scheme inherited from the shaman’s island culture. Except of course that the scientific lab culture is not as alien to the social scientist as the islanders’ may be; one would not normally have to learn a completely new language and there are underlying social structures common to both the social and the lab scientist’ wider ‘Western’ culture.

When entering a lab for the first time, the social scientist is in a prime position to carry out what is known in the social sciences as *unobtrusive observation*, a recording of research subjects in which there is no interaction with the observed subjects. Notice that this recording can be done whether the actions are meaningful or not, just as the shaman’s actions may be recorded even if they mean nothing from the social scientist’s frame of reference without prior exposure to the island culture.

Unobtrusive observation is a valued methodological goal for some social science traditions because it can be argued to be an ‘objective’ recording of what happens in a culture’s ‘natural setting’, which the social scientist is supposedly not interfering with. It is ‘objective’ in the sense that the social scientist as a particular ‘knowing subject’ is removed from the research and acts only as some sort of ‘standard’, *impersonal* recording device.

*Discussion: What is ‘positivism’ and what is its relationship to unobtrusive observation? How is ‘positivism’ related to the very early history of the social sciences (refer to A. Comte)?*

**Waiter, there’s a sociologist in my soup!**

All qualitative social scientists should be aware from the start of a research programme that fully unobtrusive observation is at best an *ideal* situation in most research settings. Unless the social scientist is working in a scenario where he or she cannot definitely be identified as a social scientist (e.g. recording what happens in a massive crowd setting, where the observer has no effect on the crowd’s behaviour) the very *presence* of a stranger or – even more direly, of a social scientist – may modify the observed subject’s ‘natural behaviour’.

 People tend to act differently when a stranger is around, and particularly in an intimate setting. Imagine you invite a good friend for dinner and a new acquaintance is brought along. Your friend introduce the person but despite your best efforts to be a good host the stranger offers no clue about himself, what the relationship is to your friend, or even whether he is enjoying himself – though at no point is he rude. The stranger simply *watches* you. Would your actions be the same as if the stranger weren’t there?

 So apart from being a situation that is hard to realise in practice given that the very presence of a social scientist is obtrusive, supposedly-unobtrusive observation also has other conceptual caveats. *If* a social scientist could become ‘invisible’ to the group or persons targeted for observation, how much would have to be recorded? As social scientists we have a finite capacity for information gathering. What guarantees that my choice of information gathered is relevant if I have no means to probe whether a particular event is relevant to the subjects in front of me or not? What guarantees that what I missed wasn’t crucial? Without a minimal comprehension of what is going on in the lab, how is the social scientist to know what is *really* important? Was a failed experimental run that a graduate student was so troubled about a normal or abnormal occurrence? Should I as graduate researcher use my very precious and precarious time to record that failed event extensively, or would that be wasting time on what was just a trivial and unimportant mistake?

As an unobtrusive observer, those questions are impossible to ask and very hard to answer, but apart from that *all* observation is, to use an STS term, ‘theory-laden’.

*Questions: Are there differences between a social scientist ‘obtrusion’ and that of a natural scientists? (Consider different kinds of sciences, e.g. astronomy, physics, molecular biology, ethology). Do you think that natural sciences’ observation ideals influence social science discussions and expectations?*

**Participant observation**

The methodological complement to unobtrusive information is known as *participant observation* which Schwartz & Schwartz (1955, p. 334) define as

“…a process in which the observer’s presence in a social situation is maintained for the purpose of scientific observation. The observer is in a face-to-face relationship with the observed, and, by participating with them in their natural life setting, he gathers data.”

The main difference with unobtrusive observation is that in participant observation the persons to be studied are from the outset *fully aware* that they stand in the presence of a social science researcher. But if one knows already that the researcher’s presence will affect the scientist’s ‘natural state’, which is after all what as social scientists one would *ideally* try to describe, how is this interference handled?

 There are many ways to go about this and the discussion is far from trivial so I cannot hope to do justice to it here, but there are various strategies I use to come to grips with ‘interference’. One way when there is time is simply to have the target group become accustomed to the social scientist’s presence through prolonged exposure and let it go back to it’s natural way of going about. Novelty causes changes in behaviour, but lack of novelty can make things return ‘back to normal’. The first day that target group is exposed to the social scientist, the observed persons might act differently to what is ‘normal’: be suspicious towards or avoid the researcher altogether, but in time they can become accustomed to the stranger through simple exposure. My own PhD ex-supervisor, for example, has hung around the same physics community for nearly twenty years and he is now as much a typical sight at the scientific meetings they hold as any of the field’s senior researchers, even though he is always gathering data (and the scientists know it).

 Another strategy is to directly assure and hopefully convince the target subjects that one’s research is not about them as particular persons, but as embodiments of their social group. This is necessary anyway because nowadays participant observation can’t be done without taking ethical issues of anonymity into consideration, but it can also be useful to have the observed persons assured that one is not there to pry out secrets or spread inside gossip, which in my experience is something that natural scientists tend to think is the only reason why a sociologist would want to go to a scientific lab. It doesn’t mean that people will believe you, but if you’re persuasive enough this might soften the way, particularly if extended exposure is not a choice. This not always works though; I had to radically shift to my PhD topic after one semester of fruitlessly trying to convince several experimental labs of allowing me access to their research sites because they thought I was just out for gossip in what was already a highly controversial field.

**Levels of interaction**

A further way to classify observation is to think about how *interactive* the researcher is relative to the social setting of the observed population. To put it in simpler terms, once the social scientist has moves to the target group’s natural setting, how close a relationship is one allowed to build with the group or individuals there? Does one merely appear as a recording device that, though visible, is clearly from another world as in unobtrusive observation? Is it legitimate to ask questions once in a while? Is it ok to be on friendly terms with some of the people there in order to build rapport and get better data? Would gaining full entry into the target group offer any kind of advantage or disadvantage?

 Gold (1985) identifies four different levels of interaction as usually found in methodology treatises, which from least to most interactive are: *complete-observer*, *observer-as-participant*, *participant-as-observer* and *complete-participant*. The complete-observer is the position closest to the unobtrusive observer, only differing in that the target group is aware of the observer’s presence. The observer-as-participant, is according to Gold (and many other social science methodologists) the best position, in that everyone is well aware of what the researcher’s role is, while the researcher can still interact with the target group in ways that will minimise the effect on the group’s day-to-day conduct. So yes, asking questions is legitimate, but not interrupting an on-going experiment, or challenging the view expressed by a member of the lab on a particular subject. All in all, however, there are no hard rules as to what you can or can’t do as an observer-as-participant.

 The participant-as-observer is a very different category. There is a major change in the relationship between the observer and the target group here. The participant-as-observer can *meaningfully interact* within the research setting to a significant degree. It may be, for example, that after observing an experiment run for a hundred and thirty seven times, the social scientist might be much more aware of the details in some crucial step in the experiment than would be a student just beginning his traineeship and say “hey Bob, I know I’m just a sociologist but you might want to make sure that the power source is set below half an amp even though the manual says one amp before you turn that machine on. I’ve seen the experiment fail a thousand times because Mark the technician always forgets to tell new students that the experimental protocol is out-dated.” This has obvious advantages in increasing rapport. Perhaps at some point this same researcher could be asked for help in a particularly simple step of the said experiment when not enough hands are available. Or maybe invited to lunch with the rest of the group. The observer is no longer ‘just a stranger’ anymore.

 The participant-as-observer category, by the way, can also include an ex-member of the community, an ex-scientist like me in the later stages of my PhD, who goes back and studies a scientific community he belonged to even though not formally part of the community anymore. During the earlier part of PhD I still attended colloquia and workshops in what were previously my own physics research topics, but at that point I was not able to keep up with the rapidly changing field, as sociology became my prime concern. People knew me, but also knew I wasn’t working in the field anymore, so I had no problem chatting to some old colleagues or interacting with the new students about more general considerations.

There are in fact a lot of ex-scientists working in STS (though not all in their former fields) and while many methodologists consider that observer-as-participant is the ideal position, I have always found that participants-as-observers do work that is just as good.

*Discussion: One of the most important findings in STS has been to explicate the role of ‘tacit knowledge’ (things which people know but don’t explicitly say or write) in understanding a culture, and the role that physical immersion plays in understanding a culture through the acquisition of tacit knowledge. How important do you think physical immersion is for your own research agenda? Can you think of tacit knowledge that you could not have gained had you not been weren’t present at a particular research site?*

**The advantages of immersion**

Participants-as-observers and complete-participants have a lot going on to their advantage relative to mere observers. In virtue of their being familiar with the social world that they want to describe they can easily identify what is most meaningful in the target groups actions or words, and what is not. Observation becomes more meaningful through immersion. Moreover, when they physically immerse themselves in their target’s context, they will not, by definition, be treated as utter strangers, so their influence on the ‘natural setting’ is not that big a problem.

I’ll give an example from my own research experience. While interviewing scientists it is very often the case that when asked to describe their work scientists will first give a ‘pat answer’, a neatly reconstructed picture of what they do but which rarely correspond to the messiness of scientific research in its common form (documenting this, by the way, is a finding we owe to STS). A scientific paper, which is nothing but a technically elaborate version of the pat answer, often reads as an essay in methodological perfection and intellectual purity. The pat answer is science’s ‘official PR response’, but it is very different to the way they would describe their work to a colleague or someone who already knows what science looks like ‘from the inside’.

Any sociologist of science can tell you that the pat answer is hogwash. Though clarity, honesty, rigour, logic, etc. are all scientific ideals that function as moral directives in most scientist’s lives, the path that leads from the messy daily life of science to the pat answer and the published paper is full of the same human messiness and idiosyncrasies as that of any non-scientist’s work. Scientists disagree about results, make mistakes, prefer to cite their buddies and build interest groups while carrying out their research as much as any other profession.

While the informed social scientist will probably be aware that the pat answer is not a reflection of daily scientific activity and the complete-participant can even *testify* to it, this doesn’t mean that the targeted scientist will give away the inside secrets so easily. The social scientists can then try to *intervene* on the pat discourse and, with luck, succeed in bringing out a more accurate account. Of course, a naïve observer-as-participant (and even more so the complete-observer) has no recourse to this inner knowledge, and could simply reproduce the pat answer as ‘empirical evidence’.

I experienced this first-hand in one of the first fieldwork trips I did as part of my PhD when I interviewed a very well renowned theoretical physicist. I had written to him asking for an interview as a ‘PhD student from a sociology department’. One of my first questions was concerning the kind of stuff he did everyday, because, I explained, I was interested as a sociologist in what theoreticians actually ‘do’. He answered, very plainly, to my opening question.

*Theoretician:* If you’re interested in what I ‘do’ all *you* have to do is go and read my papers.

But I had done research in theoretical physics. I had published papers. I knew that most of the hard work done in writing a paper does not, by default, get reflected in the paper. So what I did was ignore the pat answer and ask more concrete and decidedly informed questions, simultaneously showing in an off-handed manner that I knew what I was talking about. Near the end of the interview his attitude was very different and we ended up talking a bit about my own work, “so… you’ve actually worked in such-and-such topic huh? Ah yes, so you must know such-and-such person from the Physics Institute!” Rapport. We had a second interview the next day, which was probably one of the best interviews I ever did. He could not have been more outgoing and candid now that he knew he was not talking to ‘just a sociologist’. Compare the first day’s hostile response to how the second interview started the next day:

*Reyes-Galindo:* Yesterday at the beginning of our interview I asked you ‘what is it that theoretical physicists do?’ and you said that if one wants to know, it’s very easy: you just have to go look at the published papers.

*Theoretician:* Yes, then you told me – and I agreed with you – that this doesn’t give a clear picture of how you do things. It doesn’t give a picture of what you’ve done beyond the results. It doesn’t always give a clear picture, but it’s the same as with any creative activity. It’s the phrase, ‘Art that conceals art’. Which is fine! People don’t want to know that sort of thing when they go to a music concert! They don’t want to hear all the practicing of the scales, up and down, that the musician has spent hours and days doing.

Of course, as a sociologist, I was plenty interested in the ‘practicing of the scales’ dimension to his work, but it was because I had managed to build rapport as someone who knew something about real science (and not in my role as a sociologist) that I had actually managed to get the kind of material I wanted!

*Discussion: When people ask you about your own research work or studies, what kind of answer do you give; a pat answer or a more ‘realistic’ one? Why do you think that scientists give pat answers in the first place?*

**Participant observation’s Twilight Zone, or the danger of ‘going native’**

If there is one challenge that will be raised if you adopt an interaction-heavy participant-as-observer approach or a complete-participant approach to your research it is if and how and you have adopted a strategy to avoid ‘going native’. This term harks back to the uglier days of Victorian Colonialism when it was considered very bad form for a civilised visitor to the colonial lands to adopt the ‘inferior’ customs of the local populace (one can read an ironic criticism of this period of history in Conrad’s *Heart of Darkness*). In the social sciences, the oft-used term ‘to go native’ means to uncritically adopt the customs of one’s research target group, and the implied connotations are just as negative as in its original usage even if they have a different sense. For most social scientists “Thou shalt not go native” would probably rank amongst the most feared Commandments.

 ‘Uncritical’ is the key word here. Imagine a social scientist describing a scientific controversy between two labs, but then siding with one particular lab and actively defending it in academic writing because a scientist he has become friendly with someone who works there. That would be a hard-core case of ‘going native’ and a very ugly one at that. Imagine a sociologist that started to reproduce the natural scientists’ pat discourse when people asked him to describe science from the inside. “Well, science is like this: [pat discourse]”. That would also be going native. But the sociologist could very well say, “well, scientists say that ‘[pat discourse]’ ”. That by itself would *not* imply having gone native because the sociologist sounds like having an awareness that “it’s what scientists say *as* scientists”. The sociologist in the latter case has *exited* the conceptual context that gave rise to the pat discourse.

*Critical* thinking requires *reflexivity*, the ability to *go back* to one’s experience from a different vantage point than the one that gave rise to the experience. Thus, one can be a complete-participant fully immersed in a scientific context, but write as a social scientist if one can take that immersed experience and reframe it as a social scientist would. This is where one’s training as a social scientist becomes most important. All those theoretical frameworks and concepts you are familiar with can be scrutinised to enable one to either reformulate perceived experience, or to focus new perception in a definite manner. At it’s most proficient level, I would say that this implies a sort of game in which the social scientist/participant focuses in and out of the target world smoothly, suddenly seeing things ‘from the native’s point of view’, then zooming out to reflect on this experience.

**Participant comprehension**

Gold suggests that for participant-observers, the observation process itself requires one to always think as a social scientist, and that if this is not the case either one has gone native or is one step away from it. I would like to propose a different view, based on what sociologist of science Harry Collins has called the *participant comprehension* approach. According to Collins, it is not the observer’s distance relative to the target culture that is the true measure of doing good sociology. Collins from the start advocates a deep form of immersion, the deeper possible the better: ideally, one would want to see the native’s social world as a native, but *at will*. To *portray* it as a native would would be the perfect empirical scenario, but to step out of it at will would be the cornerstone of the ideal sociological point of analysis. Because understanding and not information-gathering is the key goal, it is *comprehension* and not *observation* that is the chief purpose of this research programme.

I turn to my research case proper to explain the concept of participant comprehension better. Since I had been fully immersed in the world of theoretical physics for over ten years prior to my PhD, had been trained as a researcher, written articles and spoken at conferences, gone to seminars, etc., I knew the world that was the target of my research perfectly well. In a way, I had achieved what Collins suggests as the foremost empirical goal of the social scientist: full immersion not merely into the technical practice of physics but into the social world of the field (Collins does not suggest that it is proficiency in the technique of a field that is crucial to comprehension but only in the ‘form-of-life’ of it, a term coined by Wittgenstein to mean *linguistic* and *conceptual* understanding). For a social scientist, this depth of immersion would have taken years of constant contact with a physics community to develop, but I simply had the ‘luck’ to arrive there from the start. But *as a social scientist*, this was not enough. My training as a social scientist was focused in developing the skills to be able to reformulate that experience within the conceptual world of sociology. In STS, for example, concepts that are used all the time to describe scientific practice include things like *tacit knowledge*, *trust*, *power*, *interests*, *ideology*, *incommensurability*, etc. each one tied to a theoretical tradition. You would never hear a physicist talk about what they do in their daily lives in terms of, for example, tacit knowledge or ideology, even if as social scientists *we* can ‘see’ tacit knowledge or ideology as part of their worlds and words.

John Ziman was a notable physicist who wrote a lot about physics and tried to give it a ‘social’ dimension. His books certainly contain a lot of sociologically interesting material and some ideas that resonate with STS and perfectly illustrate how ‘social’ scientific knowledge is. But Ziman reads more like ‘auto-ethnography’ in that he rarely discusses the experience in sociological concepts crucial to social scientists, or discusses his experiences from different sociological frameworks, or tries to ask many of the why-questions that a social scientist would ask about his ‘observations’.

*Discussions: Collins has coined the term ‘interactional expertise’ to describe the skill of being ‘completely fluent’ in the practical* *language of a particular social group without belonging to that social group, as opposed to merely speaking its language. What differences in interactional expertise are involved in, for example, ‘speaking French’ compared to ‘speaking to a native Frenchman from the Franche-Comté region as a native’? Which would be ideal for a social scientist doing research in a Franche-Comté village and why?*

**Participant comprehension and theoretical physics**

Why do I choose to focus on participant comprehension and why didn’t I just state my case as a complete-participant, which is how most of my ‘empirical material’ of physics was acquired? Or as a participant-as-observer which is how I carried out most of my PhD sociology work?

‘Thinking sciences’ like pure theoretical physics or mathematics make it very tricky to carry out a laboratory studies-like approach. In a lab one can observe people do things, but in theoretical physics the ‘doing’ occurs mostly inside people’s heads. I know a lot of theoretical physicist whose workday consists of going around for walks, sitting for more hours reading papers, and then and only then writing down stuff in a paper or blackboard. A significant number now spend a lot of time in front of computers, but ‘pure’ theoreticians often look down upon computer-oriented theorists so I didn’t felt simulationists really the heart and soul of theory, even if nowadays they are a very important part of it.

Also, most of what theoreticians write is in highly abstract mathematical language, incomprehensible to the general public (and even to some of their lab-oriented physics colleagues). The social scientist therefore finds relatively little to understand through a theoretical writing point of access. Given the difficulty in ‘observing’ theoretical practice, until now there have been only a handful of sociology of theory studies and I know only one sociology book, by Dan Kennefick, that concentrates on theoretical physics, in contrast to the large literature on experimental physics. Kennefick is an ex-theoretician.

In a social world like theoretical physics’ where interesting ‘observation’ scenarios appear only rarely, it seems that a comprehension approach is the only pathway to follow. Mere ‘observation’ would have given only very limited access to the world of the ‘thinkers’. Fortunately, I had been part of the ‘thinkers’ myself. This does not imply that observation played no role in my work. I had, after all, almost a decade of complete-participant observations in my head, which were what then paved the way for interviews as guided ‘snapshots’ of theoretical practice.

*Discussion: The paper concentrates on the sociology of science, but can the discussion be linked to other research objectives? Is participant comprehension always the single best approach? What are the disadvantages in participant comprehension as opposed to the other approaches?*

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**Further reading**

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