Why is Representation Communal Rather than Private?
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Much work has been done by philosophers of science on the topic of scientific representation. This work has often taken to answering one of two questions. The first asks about the typical uses of representations, identifying common features or perhaps peculiar but instructive features of different types of representations. The second question attempts to give a strong account of the nature of representation, perhaps explaining representation in virtue of structural isomorphism, similarity, or in reference to the inferences made by an agent who is doing the representation. While these are rather interesting questions which deserve attention, I think there is another interesting question which has received less attention: why is representation as it is? In this presentation, I will take up that question. I will work within a broadly inferential account of representation, drawing an instructive comparison to ‘reminiscence.’ Like representation, reminiscence is also practical; that is, it is a relationship that holds in virtue of the inferential performances of an agent; additionally, it often (though not always) involves similarity of some sort. Reminiscence is also interestingly private: whether or not any agent is reminded of some object is entirely up to their private performances. The same is not true of representation, which necessarily requires reference to the judgments, associations, and intentions of a particular community. I show this by first explaining why this is true of artistic representation, and then turning to examples of scientific representation. The examples serve to show the importance of the social reference, but also to show that this does not make representation non-inferential. As a closing thought, I link up these thoughts on representation with Wittgenstein’s private language argument, indicating that this fact is not incidental, but rather a necessary feature of representation within the practice of scientific inquiry.

The Role of Subjective Models in Proto-Scientific Measurement
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The earliest stages of a measurement practice typically involve the operationalization and objectification of some subjective assessment of the world via an external, publicly accessible measurement device: for instance, the transition from subjective sensations of hot and cold to the use of columns of fluid in thermoscopes for measurement of temperature (Chang, 2004). The refinement of this measurement practice is then guided by parallel developments in theoretical models (van Fraassen, 2008; Tal, 2012). In this project, I consider strategies for ensuring measurement stability when an objective model is unavailable. The examples I consider resist objectification either because they are targeted at inherently subjective quantities (the Scoville scale for spiciness; the Mercalli scale for the intensity of earthquake effects) or because the relationship between observable effects and presumed underlying cause is too convoluted to permit observer-independent operationalization (academic grade assessment; the use of looking-time to measure infant novelty detection). These measurement practices conform to the standard formal account (Krantz, et al., 1971) and appear to exhibit improvements in rigor and stability over time. However, I argue that the standard analysis of such improvements in terms of parallel theoretical developments is unavailable here due to the constitutive role of subjective mental models in these practices. Traditional analyses of the role of mental models in scientific reasoning (e.g. Hesse, 1962) take them to be externalizable for community assessment via (e.g. mathematical) public descriptions. However, the models that guide these measurements cannot be communicated explicitly —this is the sense in which they are subjective. Nevertheless, training and intersubjective comparisons may serve a regulatory role, allowing for improvements in both precision and accuracy of measurements that approximate those which can be achieved through interplay with objective theoretical models. This analysis sheds light on more general questions about the theory-ladenness of data accumulation and scientific progress.

Scientific understanding as guidance of and for cognitive activity
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Scientific understanding has become a trending topic of interest in the last few years. This is demonstrated by the progressive increase in the number of publications and works of authors with the main research theme as scientific understanding. Unfortunately, a clear delimitation of the possible objects of scientific understanding is still absent. There are two fundamental perspectives to approach the issue: (1) the perspective from which scientific understanding is characterized as the result or product of certain cognitive processes; and (2) the perspective from which scientific understanding is conceived as an ambiguous epistemic practice. In the
following article, I argue in favour of this second perspective from an analytical point of view. I propose that scientific understanding is a set of cognitive activities that have been proven successful in achieving one or many of the traditional epistemic goals of science—prediction, explanation and description of phenomena and entities of the world—with the special condition that these cognitive activities must be adaptable to representation in certain specific languages to serve as guides for other agents when performing them. In summary, to scientifically understand a phenomenon (p) implies that one must be able to intelligibly represent the successful cognitive activity (c) of achieving a specific epistemic goal (g) relative to the phenomenon (p) in question.