'Found Science: Using Race Concepts in Science'

Cross-disciplinary scientific work is called upon to combine theoretical insights from different disciplines. Science studies flags a key problem here: Different theories, even within the same discipline, are often *incommensurable*. The concepts and ideas of one theory do not match up with those of another[1]. Compare for example relativistic physics to classical physics: classical physics thinks of 'length' and 'time' as fixed but special relativity understands 'length' and 'time' as relative to the velocities of an observer. The problem of incommensurability persists across disciplines. For example, the notions 'power', 'supply' and 'work' are each understood across physics, economics and sociology as picking out different physical, economic or social phenomena, and each discipline has developed more than one theory to study them. The picture is complicated further by variations in, often hidden, assumptions that support each theory.

Take for example the controversial variable 'race' and how it is understood in different medical disciplines in the US. A lot of research and effort is aligned by interests in what everyone calls 'race'. Efstathiou (2009) argues that what variation 'race' picks out for epidemiologists and what variation it picks out for geneticists is different *in type*. Epidemiologists standardly care about variation in risk factors for common but complex diseases. They ask if 'race' picks out *this* type of variation successfully. On the other hand, geneticists care about markers in the genomes, in the bodies of individuals. So what they ask is whether 'race' picks out any interesting patterns on a molecular level (which, in the case of the US population, it seems 'race' does –cf. Tang et al 2005). This is a case where we get a loaded, common, or what Otto Neurath calls a *Ballung* (congestion) concept, 'race', to work in the service of different scientific projects. But concepts named 'race' in each discipline will often differ significantly in meaning to deliver exact discipline-specific work.

Problems begin when we try to reason causally across domains. Are patterns of genetic polymorphisms causally related to the presence of different risk factors across the groups classed as 'races'? Does a genetic pattern with a distinctive frequency in self-identified African American race *cause* a spike distinctive of this race's risk for heart disease, as measured by epidemiologists in the US? This is not some simple mathematical problem where we can move our unknowns from one equation to solve another. The words we use are the same, but not the concepts. And yet, there is also the intuition there *could* be a useful connection there.

Dr Efstathiou's project investigates the origins of incommensurable race concepts. Her PhD identifies a process for breeding one common concept into multiple discipline-specific ones, using the example of how race concepts are used in different biomedical fields. The process consists of: first, *finding* a common concept as available –but loaded– within a scientific context, and second, *founding* that concept in the scientific context, which is to say articulating the concept in terms native to the target domain that already satisfy demands for meaningfulness and rigor. Efstathiou calls concepts that are formed this way 'founded' ordinary concepts and 'found' scientific ones[2]. Founded concepts are easy to miss as not ordinary as they are not necessarily

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[1] Kuhn 1962 is the key text here, though Star and Griesemer 1989 offer a key case study of work that crosses lay and scientific thresholds and is organized using multiply translated concepts.

[2] This account plays on an analogy between found science and found art. Found art objects exist in the common world around us but become art by being modified in appropriate ways as they are brought into artistic spaces. Typical examples of found art are Marcel Duchamp's 1917, *Fountain* (an upturned urinal) and Damien Hirst's 1999 *The Physical Impossibility of Death in the Mind of Someone Living* (a shark in a tank of formaldehyde). Found art objects are recognizably related to what they were in common life but, as found art, they function in different, more limited (and also extraordinary) ways: So we should not mistake found art objects for any ordinary ones. Similarly concepts we see labelled by common terms in scientific domains look like they are common because they are named by common words, but the

operationalized or quantized; they are sifted and modified conceptually just enough to make them pass as relevant in the scientific discipline in question. So for example, understanding 'race' as related, even remotely, to the concept of a 'population', which is native to biology, can give geneticists working with the concept 'race' enough grist to work up an appropriately modified and genetically meaningful, founded notion of race, but which will be no ordinary race concept.

More generally, science studies teaches that incommensurability puts science in a bind:

- First, it inhibits effective communication in a multi-disciplinary group. Researchers from different disciplines read the same terms differently and these readings may conflict and compete for authority. So negotiating theories can cause friction and confusion. This is a problem often labeled a lack of 'transparency' in the work of scientists. But try to solve this problem and a second problem crops up: loss of rigor[3].

- Interdisciplinary work often tries to move forward by shared standardizations of some key concepts. But stripping specialized concepts of their refined meanings can make these concepts unsuitable for the causal reasoning that is undertaken in each discipline. When shared theory is lacking, inter-disciplinary science has to employ context-specific understandings of key concepts if it is to do any *science* at all[4].

Found science helps move us out of this bind:

1. First, found science gives principled reasons for pursuing interdisciplinary approaches to shared problems. Take the case of 'race': geneticists' founded race concepts may be useful for examining inherited disease risks, but they will be useless for studying racism. Deciding health policy on the basis of geneticists' founded race concepts is a bad idea because it neglects, by default, important social effects that social scientifically understood, founded race concepts track.

2. Second, found science comes with a method for managing conceptual pluralism in situ. *Found science* is at heart a simple and intuitive frame to help researchers understand specialized scientific concepts as related to but different from common concepts. It gives a general frame for tracking the conceptual pluralism that interdisciplinary work can breed.

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concepts are *founded* differently so they can do different scientific work in scientific contexts and they are no *ordinary* ordinary concepts.

[3] Atkinson 2002 discusses this trade-off.

[4] Cartwright 1999a, 1999b

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Short version:

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