Epistemic Responsibility and Collaboration in Science

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I. Motivating the problem

Examples:

- "Observation of Top Quark Production in $p\bar{p}$ Collisions with the Collider Detector at Fermilab" – A 1995 paper by the CDF Collaboration, 600+ physicists.
- The mass of the Higgs boson is 125 GeV. – Discovered by ATLAS and CMS collaborations at CERN, 5,000+ collaborators in 2015.
- Superluminal neutrino? – Anomalous result reported in 2011 and retracted in 2012 by OPERA collaboration, 160+ physicists.

Who is **epistemically responsible** for the results of collaborative work?

First, why do we need epistemic responsibility to begin with?

> Incentive structure of science: Epistemic responsibility is essential to adjudicating both *credit* and *blame* in science. Funding decisions, tenure decisions, prizes, etc. all depend on figuring out who is epistemically responsible.

The answer to the question of epistemic responsibility in groups is not immediately obvious:

1. The collaboration as a whole (a group agent) is responsible
2. No one is responsible
3. Every member of the collaboration is responsible
4. Some members are responsible (operative members)

I'm going to argue that every agent in a collaboration can be epistemically responsible for a scientific output, but *responsible in different ways* – we need to rethink what epistemic responsibility means.

II. Against "group agent" and "no one is responsible"

Epistemic responsibility and scientific authorship: Scientific authorship is a central place where questions about epistemic responsibility are raised. Most of how we think about epistemic responsibility come from the single author/individual case.

"Group agent": Wray (2006, 2018) has argued that we should generally conceive of papers produced by collaborations as being authored by one collective author with one collective voice that speaks in the scientific paper.

"No one": Huebner, Kukla, and Winsberg (2017) and Winsberg, Huebner, and Kukla (2014) have argued that there is **no one** who is truly responsible for the results in large collaborations.

> "… neither individual nor multiple nor group authorship is plausible in radically collaborative research, at least in anything like its current organizational form. As things stand, authorship *simpliciter* remains impossible in most radical collaborations." (2017, p. 113)

Why we should reject the "group agent" account:

- The problem of how a group agent is formed
    - Margaret Gilbert's plural subject account – members jointly commit/accept to a view or an action to be the view or action of the group
    - Complexity and size of scientific collaborations make forming a plural subject difficult, if not impossible
- The incentive structure of science is based on individual scientists: ultimate need to evaluate individuals (hiring, tenuring, grants) and who to invite into a collaboration
- Positing a group agent does not actually elucidate the *concept* of epistemic responsibility in science
- Collective responsibility in science ends up looking like individual responsibility

Why we should reject the "no one is responsible" account:

> "For someone to be accountable for a scientific claim, she must believe that there is a coherent set of epistemic and methodological standards that govern its production, and she must take responsibility for defending those standards and explaining how they are met." (2014, p. 17) "This requires the ability to know how all of the pieces of the research fit together into a coherent whole" (2017, p. 105)

- No one can play this role in collaborations because of **epistemic opacity** when epistemic labor is distributed:
    A. **Complexity**: the research is so complex and historically contingent (path dependent) that it is beyond the cognitive ability of a single agent to fully comprehend,
    B. **Values**: methodological decisions are made locally and informed by local values which are opaque to other collaborators, and
    C. **Expertise**: different researchers are using different disciplinary expertise which cannot be evaluated by other collaborators.
- "There is no one who is in a position to be accountable for the entire study" (2014, p. 18) Huebner, Kukla, and Winsberg are not wrong: there is no agent within a collaboration can be responsible or held responsible the same way as we could find and hold a *single author* responsible.
- Huebner, Kukla, and Winsberg focuses on the connection between epistemic responsibility and justification:
    - If the represented results are challenged, there may be no single *justificatory story* to be told about the methodological choices made and the epistemic standards used—not even one that would need to be told piecemeal by the various participants" (2017, my emphasis)
- But "no one is responsible" response is not helpful: the current incentive structure of science will collapse if there are no responsible agents in scientific collaborations. In fact, one can easily run a *reductio* of their view to show that even group consisting of 2 people will fail to be responsible because of epistemic opacity (A)-(C).
- I believe the most promising way forward is to look for a different concept of epistemic responsibility, one that does not take the single author/individual case to be paradigmatic, and opens our evaluations of epistemic responsibility in science beyond justification.

III. Moral responsibility and epistemic responsibility

A popular analysis of moral responsibility (Watson, Scanlon, Smith): First sense, "responsibility as attributability" which concerns the conditions that must be met in order for an agent to be eligible for various forms of moral appraisal. Second sense, "responsibility as accountability" which concerns conditions that must be met in order for an agent to be eligible for moral responses and demands beyond appraisal, that is holding an agent responsible with respect to negative or positive sanctions.

Smith: Attributability as answerability—being responsible for some action or attitude Φ is just a matter of being answerable to others for Φ. Agents who are in proper "rational relation" to Φ are answerable for Φ and therefore open to legitimate moral criticism if it should turn out that Φ violates any moral norms or expectations.

Shoemaker (2011): there are important cases where Φ is attributable to an agent but the agent is not answerable for Φ. Shoemaker suggests that there are cases where one can be responsible in the attributable sense *without* being answerable.

> Cases: irrationality. An agent may both fear spiders and also sincerely believe spiders are not dangerous. We may attribute this irrational attitude to the agent even though the agent is not answerable for it, since her attitude does not actually reflect any judgments about reasons.
>
> Cases: non-rational emotional commitments. A mother of a serial killer may still emotionally care for her son despite judging that he is a morally reprehensible person. These agents cannot be answerable for their attitudes because "they are simply devoid of the resources necessary to engage with your communicative attempt" (p. 611). However, our emotional commitments are still attributable to us, even though we lack the ability to rationally justify them.

Take away: Agents may properly hold attitudes or commit actions for which the reasons are somehow not properly connected to the them.

The structure of the problem of moral responsibility bears on the epistemic case.

Shoemaker's distinction between attributability and answerability obtains in epistemic cases. Epistemic agents can hold beliefs for which the justifiers are not fully accessible to them, i.e. collaborating scientists often make claims in published papers which they are not answerable for because all the justifiers for claims are not directly available to them.

IV. The positive view

A tripartite account of epistemic responsibility:

Attributability: An agent can be epistemically responsible for a claim that P if that claim can be properly attributed to the agent. Intuitively, for P to be attributed to an agent is for the agent to be connected to P in the right way as epistemic agents. A scientific claim is properly connected to the scientists who (1) produced (causal connection) and (2) asserted (publicly avowal) that claim. A scientific claim would not be properly connected to scientists who were researching something else.

Answerability: An agent can be answerable for a claim that P in so far as the agent is able to report the reasons and justifications for holding that P. Answerability demands that one can defend and provide reasons and justification for the content and accuracy of a scientific claim. An agent can hypothetically be called to give reasons for their assertions and appropriately answer "Why?" questions directed at the agent. Epistemic responsibility as answerability is a demand for reasons to a degree which is appropriate to expect given the capacities and experiences of the agent as an epistemic agent.

Accountability: An agent can be held accountable for a claim that P if it is appropriate to blame or praise the agent for asserting that P in accordance to epistemic norms. In scientific practice, the norms in question will be social-epistemic norms like standards for what counts as an appropriate analysis, best practices for experimental design, publication norms, codes of scientific conduct, etc.

Agent can be responsible in one, two, or all three senses of epistemic responsibility.

Notice: attributability is not co-extensive with answerability. It is possible that there are claims which are properly attributed to us for which the reasons and justification are not fully accessible to us. There are at least two sources of such epistemic opacity: (1) The nature of the evidence: some of our claims about the world rely on a vast amount of complex evidence which would be impossible for any single epistemic agent to be answerable for. (2) Division of epistemic labor: scientists have different expertise and they rely on each other's expertise to make inferences about the world, but differences in expertise makes certain lines of reasoning opaque to us.

V. Who is epistemically responsible for scientific claims?

- Attributability: Who is connected in the right way to the claim in question?
- Answerability: Who can be called upon to give answers if you have questions concerning the claim? Who can give justification for the claim in question?
- Accountability: Who should be praised or blamed? Were the scientific norms followed?

Case: OPERA's superluminal neutrinos

> **Who is attributable-responsible?** Active members of the OPERA collaboration who participated in the experiment and were listed as authors on the paper.
>
> **Who is answerable-responsible?** No one in the collaboration is able to give reasons for why or how the cable was misconnected. There is no meaningful answer to unintentional equipment errors.
>
> **Who is accountable-responsible?** The spokesperson and head of experiments, for their instrumental role in making the "discovery" public. The norm that they failed was determining the appropriate time to make important scientific results public.

Upshots of a tripartite account: We can make collaborations more analytically tractable: we are now in a better position to give more satisfactory accounts of how to adjudicate responsibility in cases of complex team science. More importantly, separating answerability from the other sense of responsibility has obvious benefits:

- Important for cases when there exists epistemic opacity between collaborators
- Individual agents within a group will be answerable to different degrees and give different answers to the same questions
- Expectations of answerability for individual scientists cannot be superimposed to collaborations

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