Conflicting Expert Testimony and the Search for Gravitational Waves

Ben Almassi (2009)

Presented by: Jordan Olson on March 23, 2022

Main Questions

1. how can we make informed judgments about ***whom to trust*** given expert disagreement?

2. can experts on opposing sides of a disagreement ***be reasonable*** in maintaining their conflicting views?

3. what can the case of gravitational waves tell us about the ***epistemology of disagreement*** in general?

Main Dispute

- whether Weber had ***successfully detected*** gravitational waves; ***not*** whether gravitational waves ***exist***

Main Areas of Dispute

- replication
- theory
- calibration
- experimental errors

Main Areas of Dispute

- **replication:** do experiments need to be ***identical*** in order to count as replications?

- **theory:** if Weber had detected gravitational waves, what would that say about ***cosmology***?

- **calibration:** how do we determine appropriate ***surrogates*** for calibration?

- **experimental errors:** do specific errors indirectly cast doubt on experimenter ***credibility*** in general?

Meta-Dispute

- Franklin's and Collins' ***analysis*** of the Weber case
  - how do we figure out whom to trust?
  - is their disagreement reasonable?
  - can we learn anything about disagreement in general?

Main Areas of Meta-Dispute

- social factors
- evidential factors
- experimenter credibility
- historical methodology

Almassi's Analysis of the Meta-Dispute

- **Franklin:** argues that "Weber was dismissed on evidential, squarely ***epistemological*** grounds..."
  - but some of Franklin's evidential considerations are ***also social***
  - "***Franklin is right*** to describe the position against Weber as reasonable"

- **Collins:** "emphasizes the ***social factors*** in the formation of opinion against Weber..."
  - but some of Collins' social considerations are ***also evidential***
  - "***Collins is also right*** that Weber's unpopular opinion could also be reasonably maintained"

Almassi's Analysis of Franklin

- **Franklin:** "rejection of Weber's work was reasonable; although ***neither infallible nor algorithmic***, it was based "on valid experimental evidence and on ***reasoned and critical discussion***", not cognitive, social, or career interests."

- **Almassi:** "if the process was ***not algorithmic***, ***further explanation*** is needed"
  - what follows from the fact that there is no algorithmic decision procedure?

Almassi's Analysis of Collins

- **Collins:** "Weber was reasonable too, and had things ended differently, that outcome would have been reasonable as well... His [Collins] point is that if experimental evidence alone did not "force" the anti-Weber movement, ***something extra-experimental*** must explain the formation of this majority opinion."

- **Almassi:** what is this ***something extra***?
  - "the "something extra" Collins locates in this case is ***not overtly political***"
  - "Collins sees it [Weber's loss of credibility] as a ***social-political*** process."

Almassi's Analysis of Collins

- **Collins:** "Weber was reasonable too, and ***had things ended differently***, that outcome would have been reasonable as well... His [Collins] point is that if experimental evidence alone did not "force" the anti-Weber movement, something extra-experimental must explain the formation of this majority opinion."

- Almassi: what is this something extra?
  - "the "something extra" Collins locates in this case is not overtly political"
  - "Collins sees it [Weber's loss of credibility] as a social-political process."

- ***wtf is this counterfactual?***

Everyone Hold Hands

- Weber's unpopular opinion was ***reasonable***
- rejection of Weber's work was ***reasonable***
- Franklin is ***reasonable*** in emphasizing epistemic factors
- Collins is ***reasonable*** in emphasizing social factors

Credibility and Reasonable Disagreement

- **claim:** "credibility is a ***social factor*** with ***epistemic significance***"

- **argument:** "Reasonable expert disagreement was possible, I [Almassi] suggest, in part because of the ***social-evidential dimensions of credibility***."

Credibility: Social and Evidential

1. the trustworthiness of experimental results is partly dependent on the ***experimentalist's reputation*** in their scientific community
2. a scientist's credibility is partly dependent on their ***acceptance of the community-specific rules, norms, and assumptions*** which govern argument and discussion in that field

Almassi's Analysis of Garwin

- Garwin's "critique functions by appealing to ***experimenter credibility*** as evidentially relevant"

- main areas of Garwin's critique:
  - computer error
  - histogram bins
  - time zones
  - random data selectively presented

- "***reasoned and critical discussion*** [such as Garwin questioning Weber's credibility] can be the sort of social-epistemic enterprise capable of ***evidentially supplementing*** disputed experimental evidence"

Settling the Meta-Dispute?

- **Franklin:** "Garwin's behavior could also be that of a scientist who believed that Weber's results were wrong, and that valuable time and resources were being devoted to the investigation of an incorrect result."
  - Weber's loss of credibility is straightforwardly a matter of evidence

- **Collins:** "Garwin "acted as one might expect a scientist to act who realized that evidence and arguments alone are insufficient to settle unambiguously [the debate]."
  - Weber's loss of credibility is a social-political process

- **Almassi:** ***common ground*** between Collins and Franklin when we recognize credibility as both social and evidential

Settling the Main Dispute?

- **Feldman:** "the ***reasonable response*** to ***genuine epistemic disagreement*** among epistemic peers after ***full disclosure*** of the evidence is ***suspension of judgment***"

Settling the Main Dispute?

- **Feldman:** "the ***reasonable response*** to ***genuine epistemic disagreement*** among epistemic peers after ***full disclosure*** of the evidence is ***suspension of judgment***"

- **Almassi:** "***Full disclosure*** seems a demanding requirement for disputes in experimental physics."

- **Almassi:** "Weber and his peers could reasonably disagree in part because of their ***asymmetric access*** to the experimental evidence."

Conclusions?

- "we see how credibility assessments can license different assessments of the evidence by those with different commitments and different access to that evidence... we see how expert disagreement is possible and ***sometimes reasonable***"

- "as the gravity wave case suggests, our evidence for [scientific] knowledge ***is sometimes*** experimental and extra-experimental"

Answering the Main Questions?

1. how can we make informed judgments about ***whom to trust*** given expert disagreement?
   - well, how can we?

2. can experts on opposing sides of a disagreement ***be reasonable*** in maintaining their conflicting views?
   - what exactly does it mean to be reasonable?

3. what can the case of gravitational waves tell us about the ***epistemology of disagreement*** in general?
   - should we suspend judgment?
   - should we require full disclosure?
   - how do we balance/weigh experimental and extra-experimental factors?
   - how is credibility determined? how important is it?

Gems

Almassi is very... reasonable

clear(ish) breakdown of the dispute and Garwin's criticisms

I enjoyed the epilogue about LIGO

Integrated HPS

- Almassi uses an historical case study to (supposedly) shed light on the problem of expert disagreement

- what exactly is the philosophical thesis?
  - that credibility is (sometimes/always) both social and evidential?
  - that credibility is (sometimes/always) evidentially relevant?
  - that scientific knowledge is (sometimes/always) generated by both experimental and extra-experimental processes?
  - that the Duhem-Quine thesis is a genuine problem because reasonable people can always disagree about how to modify assumptions?


Weber Memorial Garden