Logistics: Project Milestone 2

- Milestone 2: Due Nov 4
  - Summarize your progress
    - Should make enough progress to know **whether the project is feasible**
  - Last chance to convert a research project to an extensive literature survey

- Midterm Pitch: Nov 1 (Tue), in lecture
  - Opportunity to engage other classmates
  - Format
    - Every group gives a 1-min elevator pitch about their projects
    - Data collection**: Sign up by tomorrow** if you want to collect data from the entire class
    - Group discussions
      - Three big groups, with 3~4 teams per group
      - Each team gets 10~12 minutes of time from other teams
    - Everyone is expected to attend

Logistics: Project Milestone 2

- More on Midterm Pitch: Nov 1 (Tue)

- What to do beforehand
  - Prepare a 1-min elevator pitch about your project
  - Prepare a 1-page slide and send it to me before noon next Tuesday
  - Think about how to utilize the discussion time

- Let me know by this Wednesday if you plan to engage the entire class

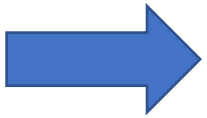
Student Presentation

- Remember to submit the peer review form by 6pm

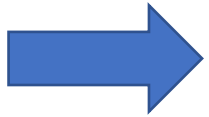
Lecture 15
Non-Independent Work

Instructor: Chien-Ju (CJ) Ho

Human Computation



"Crowd"



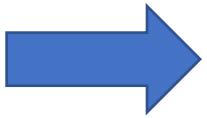
Flower
Dog
Cute
…

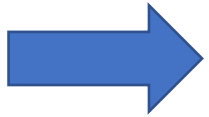
Input

Black Box

Output

Open the Black Box





Flower
Dog
Cute
…

Human as data sources: Label aggregation
Probabilistic reasoning to aggregate noisy human data

Humans are “Humans”: Incentive design
Game theoretical modeling of humans and incentive design

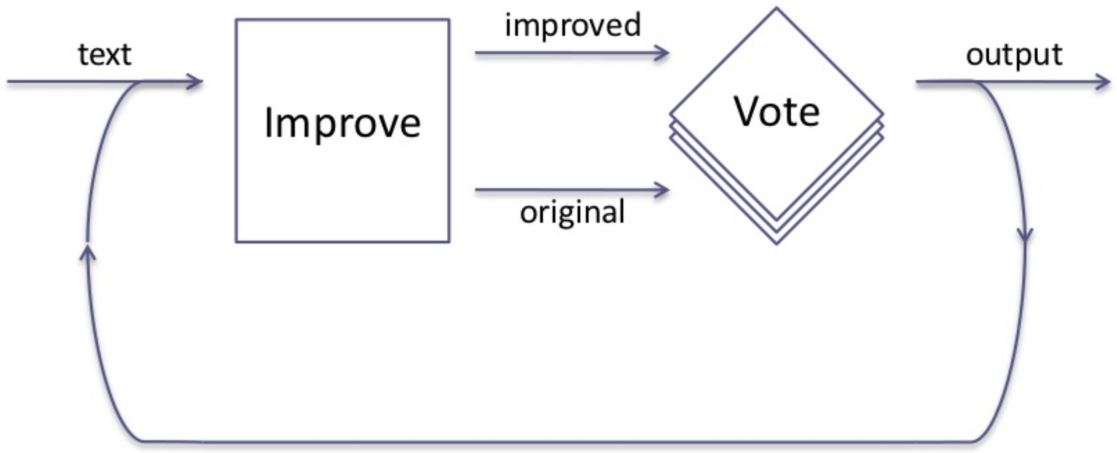
The Crowd is Connected

Flower
Dog
Cute
…

A Connected Crowd

Beyond the Independent Workers

Designing Workflows

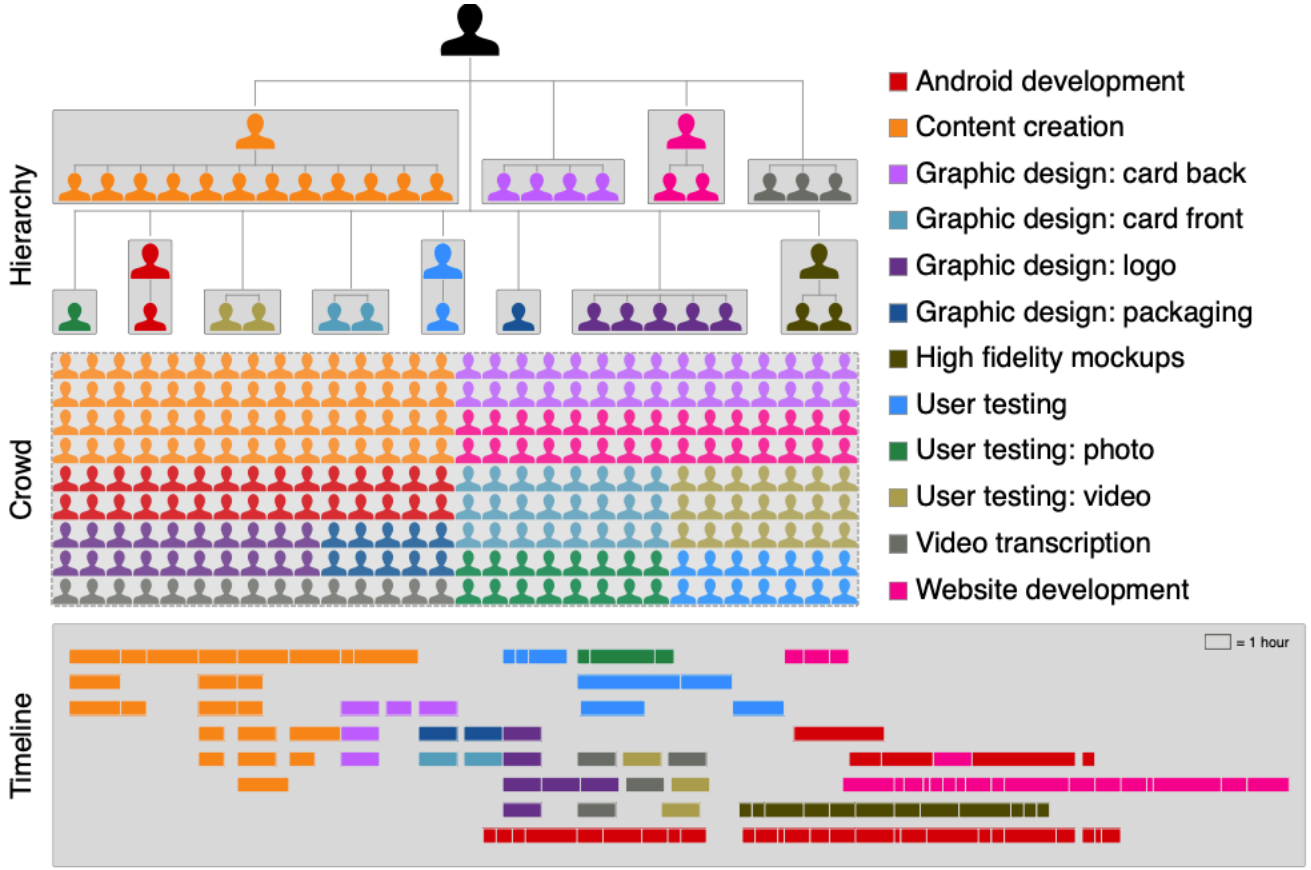


- Some workers are asked to perform **improvement** tasks
- Some workers are asked to **vote** on whether the improvement is good

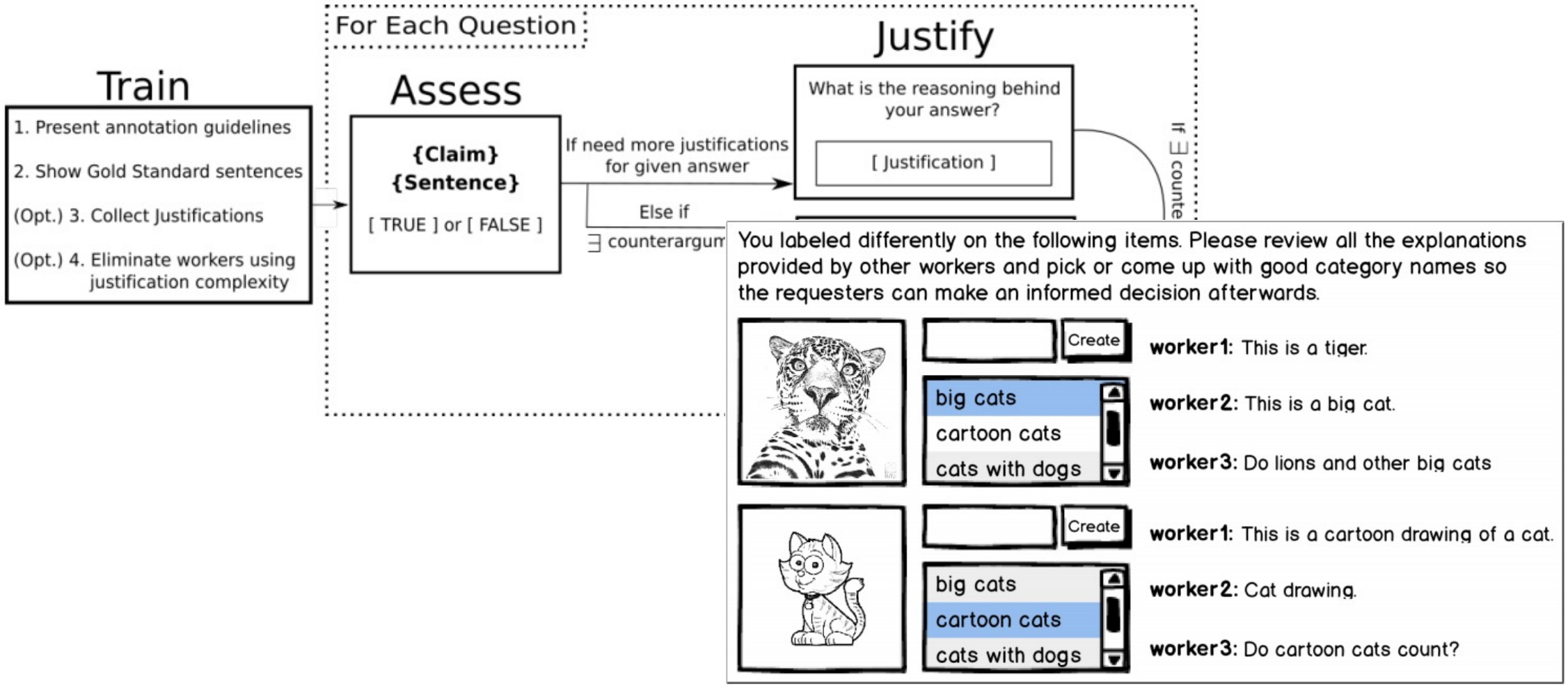
Little et al. “TurKit: Tools for Iterative Tasks on Mechanical Turk”. HCOMP 2009

Expert Sourcing and Teams

- Dynamically assembling a team of experts from crowd

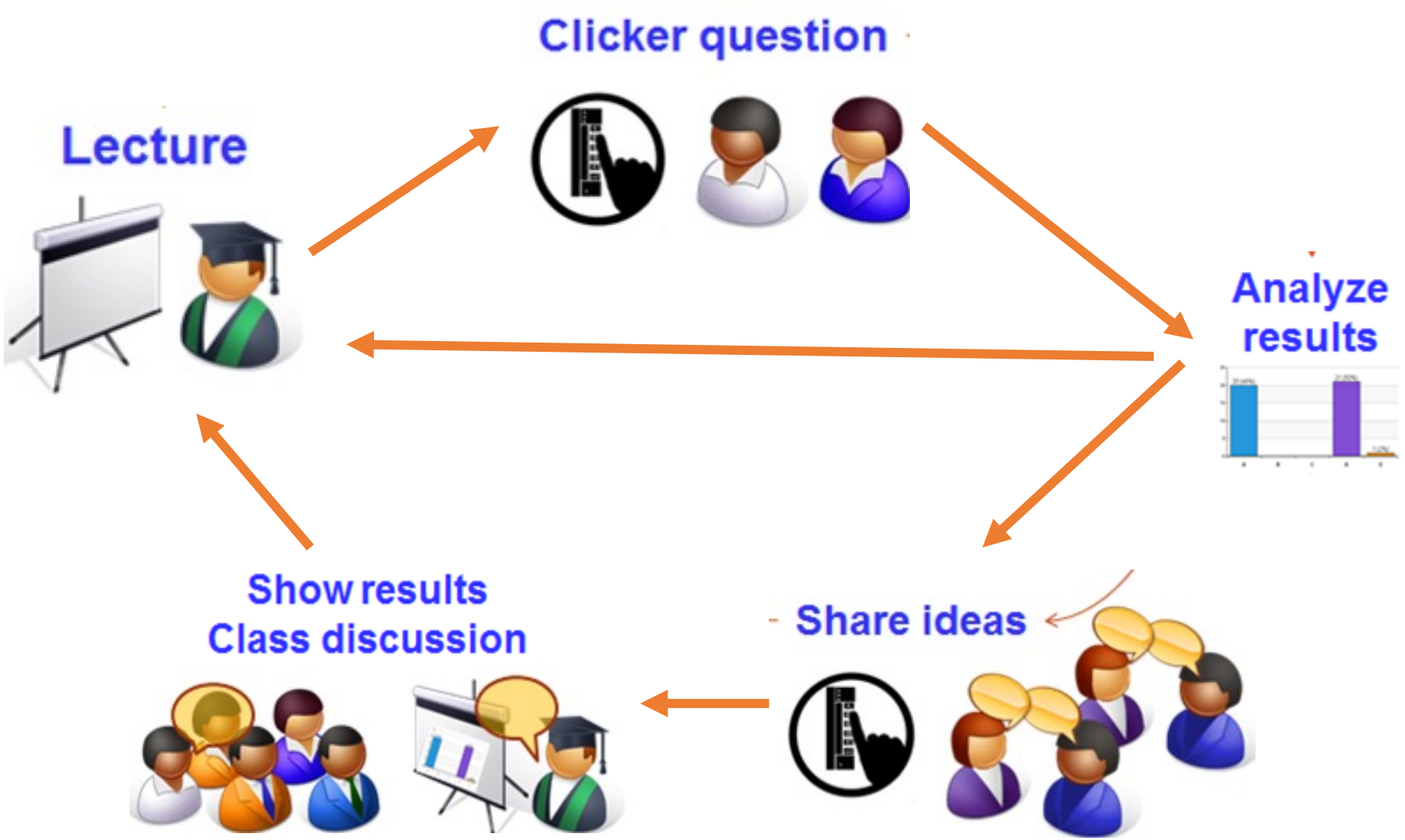


Collaborative Argumentation



Peer Instruction:
Communication helps in education

How Peer Instruction Works



Year	Method	FCI pre	FCI post	Absolute gain (post−pre)	Normalized gain ⟨g⟩	MBT	MBT quant. questions	N
Calculus-based								
1990	Traditional	(70%)	78%	8%	0.25	66%	62%	121
1991	PI	71%	85%	14%	0.49	72%	66%	177
1993	PI	70%	86%	16%	0.55	71%	68%	158
1994	PI	70%	88%	18%	0.59	76%	73%	216
1995	PI	67%	88%	21%	0.64	76%	71%	181
1996	PI	67%	89%	22%	0.68	74%	66%	153
1997	PI	67%	92%	25%	0.74	79%	73%	117
Algebra-based								
1998	PI	50%	83%	33%	0.65	68%	59%	246
1999	Traditional	(48%)	69%	21%	0.40	···	···	129
2000	PI	47%	80%	33%	0.63	66%	69%	126

[a]The FCI pretest was administered on the first day of class; in 1990 no pretest was given, so the average of the 1991–1994 pretest is listed. In 1995 the 30-question revised version was introduced (Ref. 15). In 1999 no pretest was given so the average of the 1998 and 2000 pretest is listed. The FCI posttest was administered after two months of instruction, except in 1998 and 1999, when it was administered the first week of the following semester to all students enrolled in the second-semester course (electricity and magnetism). The MBT was administered during the last week of the semester after all mechanics instruction had been completed. For years other than 1990 and 1999, scores are reported for matched samples for FCI pre- and posttest and MBT. No data are available for 1992 (EM was on sabbatical) and no MBT data are available for 1999.

[Crouch and Mazur. 2001]

Can we apply similar ideas in crowdsourcing?

Leveraging Peer Communication to Enhance Crowdsourcing.
Wei Tang, Chien-Ju Ho, and Ming Yin. WWW 2019

Peer Instruction => Peer Communication

- Apply the idea in crowdsourcing
  - Recruit a pair of workers
  - Each complete and submit the task on his/her own
  - Discuss with another worker for 2 min
  - Decide whether to revise the answer

- Research Questions:
  - Does peer communication lead to higher quality of work?
  - Are there spill-over effects?

Experiment Design

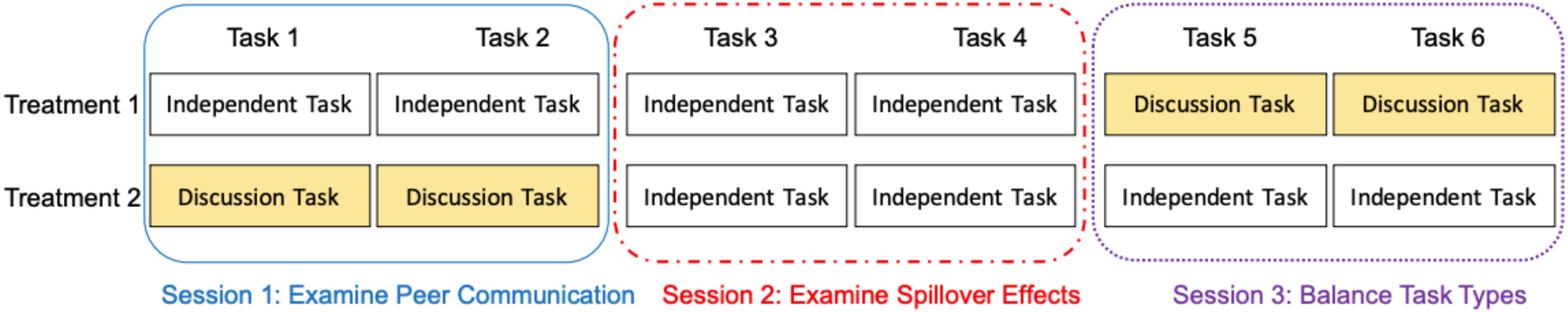
- Task Types:
  - Independent tasks: work individually
  - Discussion tasks: work with peer communication

- A naïve experiment design
  - Post two HITs
  - One with independent tasks
  - One with discussion tasks
  - Measure the end results

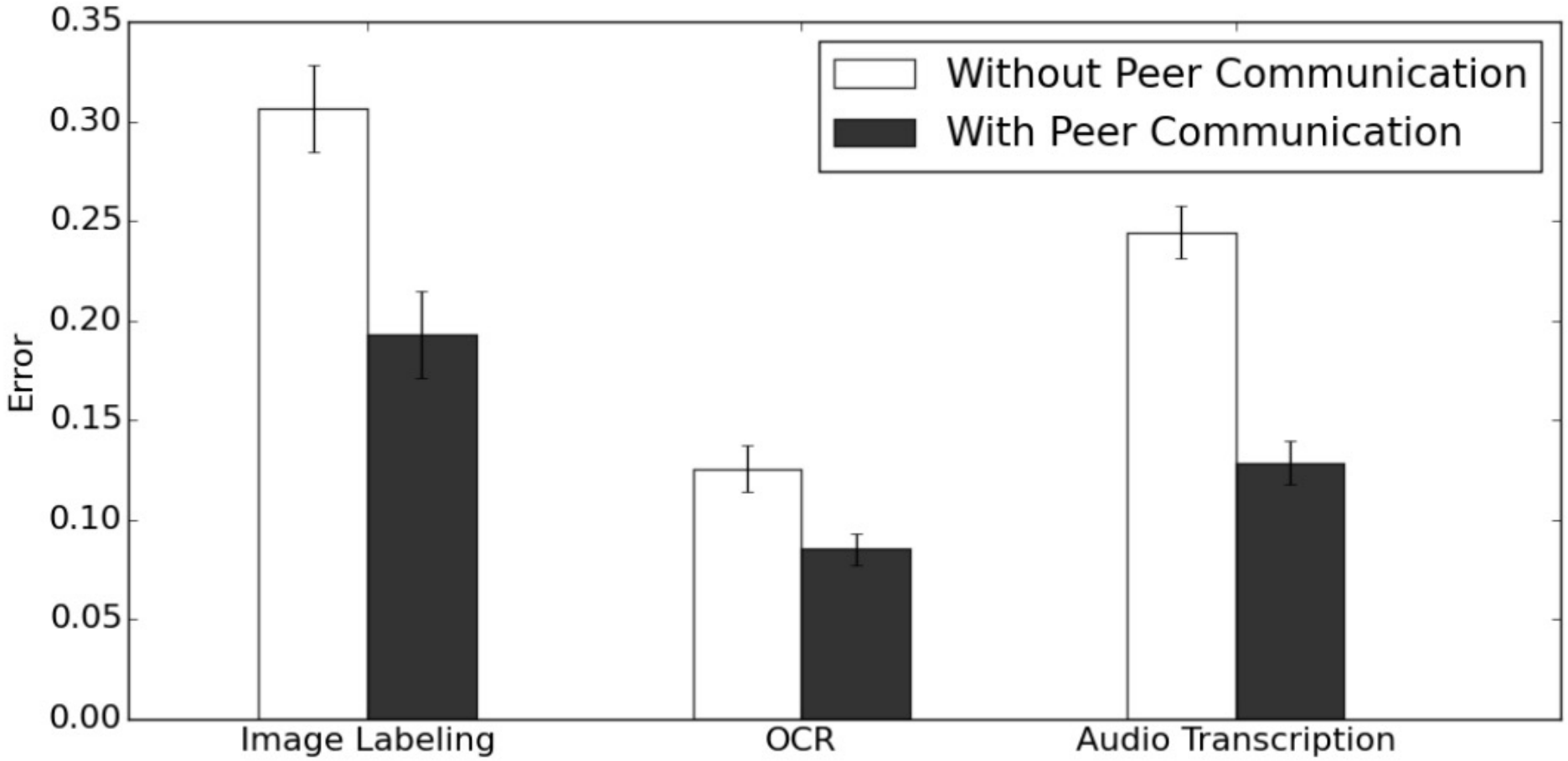
- What might go wrong?
  - Self selection (the worker population won’t be the same across treatments)

Experiment Design

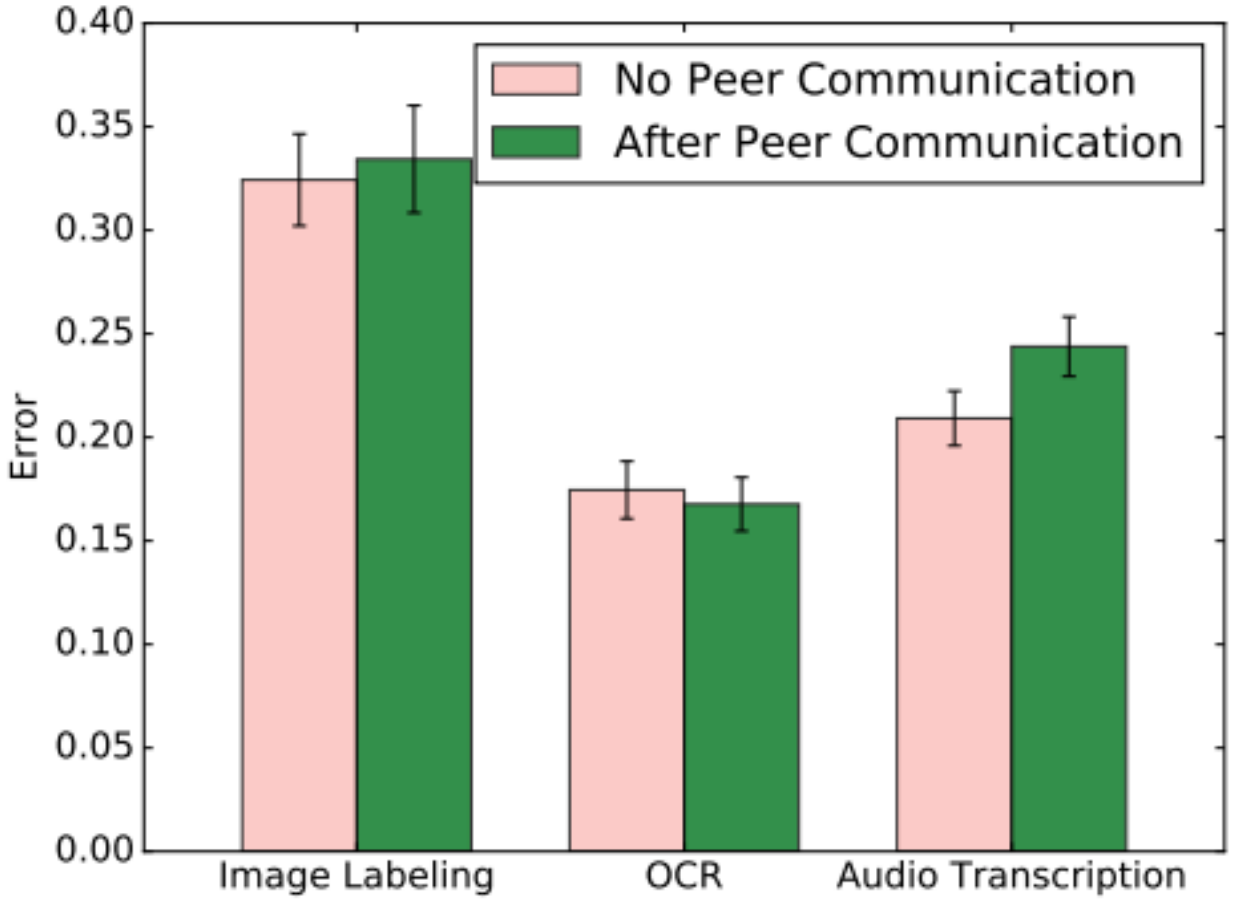
- Goal of our experiment design
  - Ensure there won't be self selection concerns
  - Be able to answer the two research questions
    - Q1: Does peer communication lead to higher quality of work?
    - Q2: Are there spill-over effects?



Peer Communication Leads to Better Work



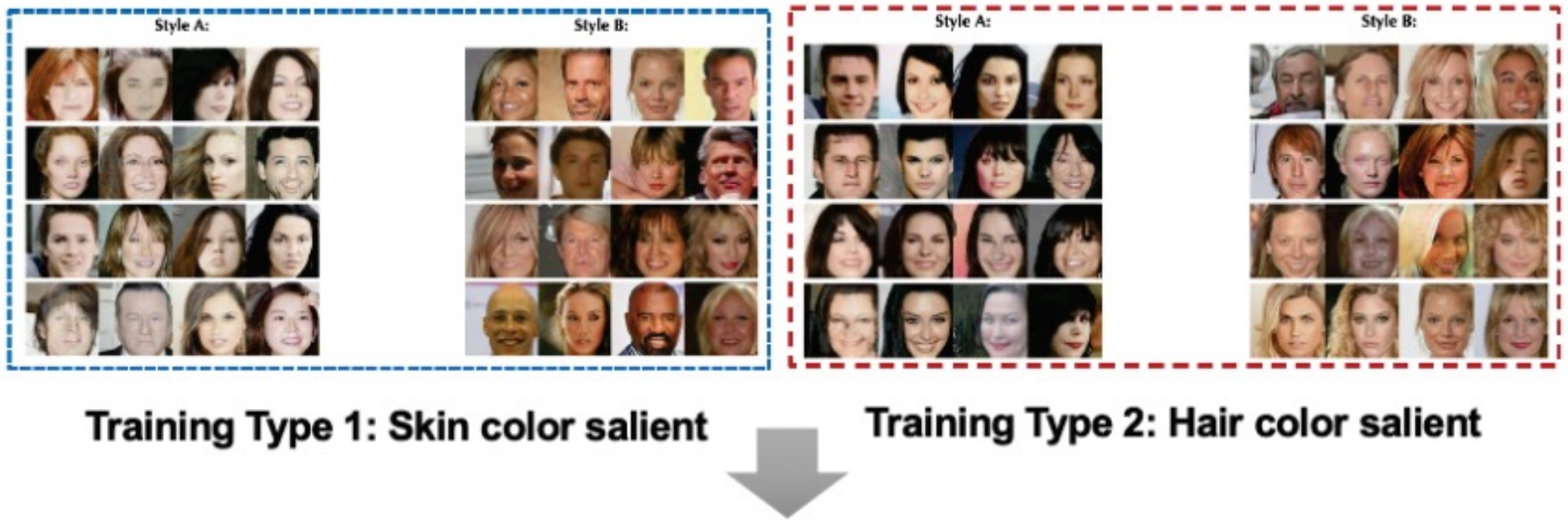
Long-term Performance Might Not Improve



- Might be due to the design
  - Need longer communication time?
  - Need feedback?

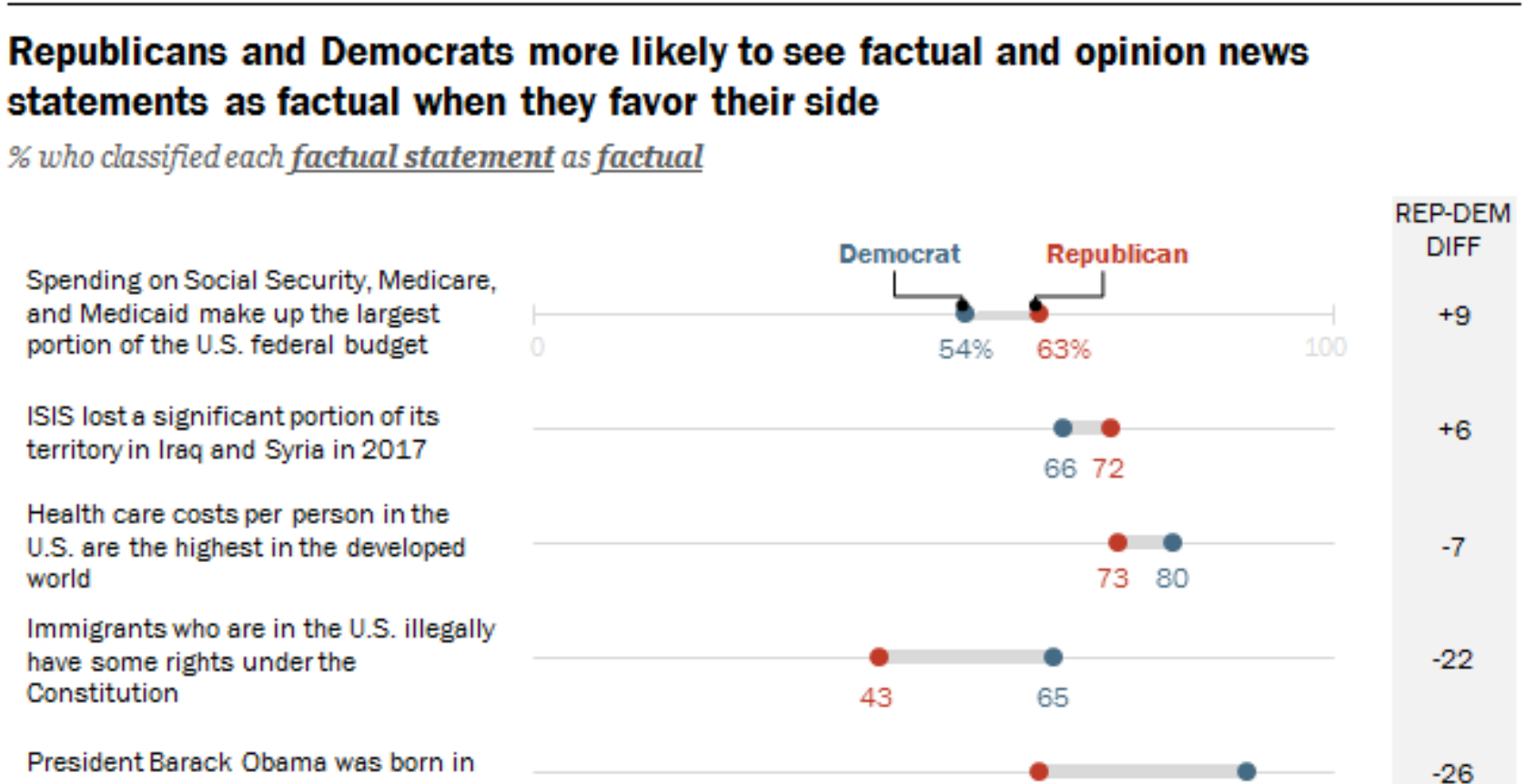
Does Diversity in Communication Help?

- Not that trivial [Duan et al. HCOMP 2020]
- Example:
  - Diversity in (artificial) skills



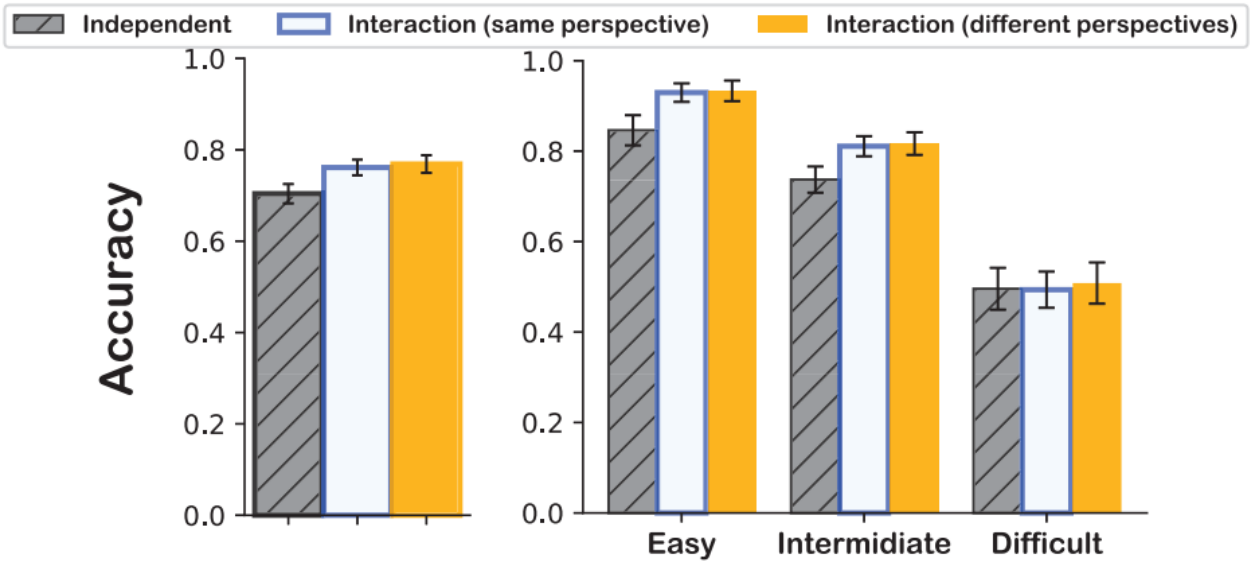
Does Diversity in Communication Help?

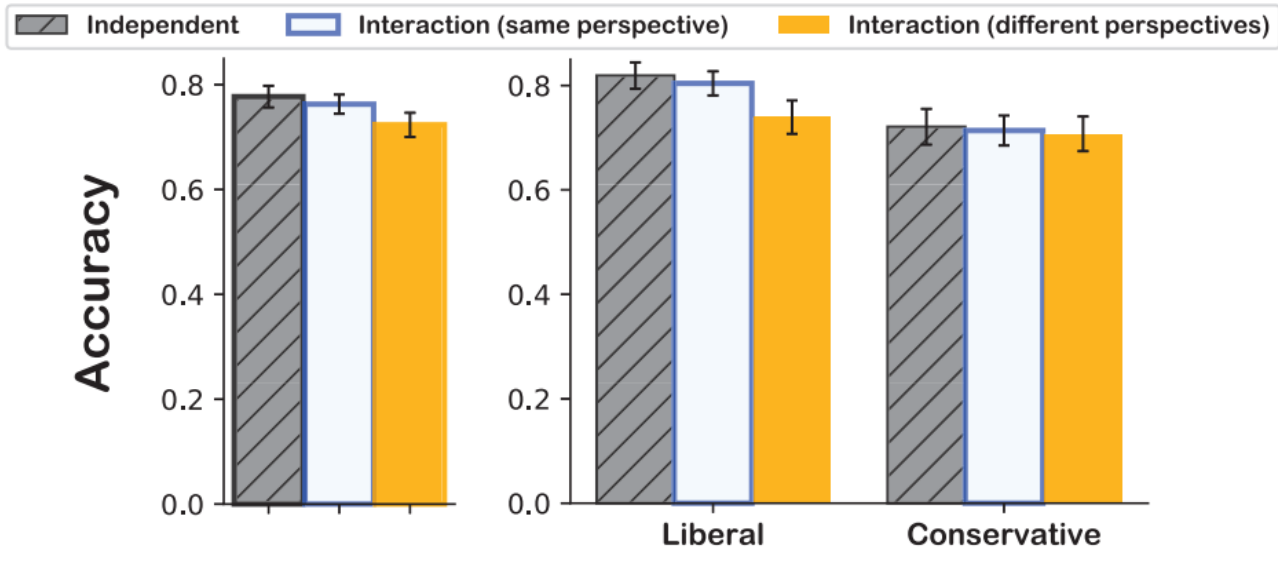
- Diversity in perspectives (Republicans/Democrats)
  - Opinions or factual statements



Does Diversity in Communication Help?

- Not that trivial [Duan et al. HCOMP 2020]
  - A couple of designs are tested; none lead to significant improvements
  - Could be that the designs happen to not work
  - Or could be due to that the “micro” properties of tasks in crowdsourcing





Peer Communication and Network

- Broader question
  - Peer communication is an edge (point to point) of a network
  - Design better network topology?
    - What do we mean by better
- What if we can’t design network
  - Networks are already there
  - The influences are also there
  - What’ll happen?

Discussion

- What can you do to utilize the network/communication to improve crowdsourcing or to achieve social good in general?

- What are the potential drawbacks given that humans are in the network and are influenced/biased by others (e.g., echo chambers)? What might we do to address that?

Hard but Important Questions

RESEARCH ARTICLE

Social learning and partisan bias in the interpretation of climate trends

Douglas Guilbeault, Joshua Becker, and Damon Centola

PNAS September 25, 2018 115 (39) 9714-9719; first published September 4, 2018;
https://doi.org/10.1073/pnas.1722664115

Edited by Matthew O. Jackson, Stanford University, Stanford, CA, and approved August 3, 2018 (received for review January 4, 2018)

”we find that belief exchange in structured bipartisan networks can significantly improve the ability of both conservatives and liberals to interpret climate data, eliminating belief polarization.”

RESEARCH ARTICLE

Exposure to opposing views on social media can increase political polarization

Christopher A. Bail, Lisa P. Argyle, Taylor W. Brown, John P. Bumpus, Haohan Chen, M. B. Fallin Hunzaker, Jaemin Lee, Marcus Mann, Friedolin Merhout, and Alexander Volfovsky

PNAS September 11, 2018 115 (37) 9216-9221; first published August 28, 2018;
https://doi.org/10.1073/pnas.1804840115

Edited by Peter S. Bearman, Columbia University, New York, NY, and approved August 9, 2018 (received for review March 20, 2018)

“Republican participants expressed substantially more conservative views after following a liberal Twitter bot, whereas Democrats’ attitudes became slightly more liberal after following a conservative Twitter bot”