### CSAs, Data, & Popular Science

### The Role of CSAs in the Education, Economic, Social, and Political Contexts

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#### Role of data in CSA assessment

- Prove 'laws'
- Make case for funding
- Improve program

# State of (CSA?) assessment: An exaggeratedly skeptical view

Planning/details are key, but real world gets in the way

- Novices collect most data
- Most data is never analyzed
- Analysis often done 'the night before'
- Decision-makers may ignore analysis

### Randomization is great, but . . .

- Details still can derail
- Results are difficult to generalize
- Costs usually preclude their use

### Naysayers harpoon impact claims

- Going from data to decisions requires logic/assumptions/judgements
- Academic bar is high
- Programs may avoid damaging criticism by avoiding assessment

### We popular scientists are not disinterested

- We have beliefs and goals
- 'Negative' results affect us as well as participants
- Funders have their own incentive structures

# How to Improve Assessment? An exaggeratedly hopeful view

Ask: 'What would movie hero(ine) do?'
Transparently state your purpose

#### **Explicitly recognize incentives**

- Note constraints imposed by incentives/structure, time/resources
- Tell with funders how their incentives/structures affect you
- Issue is not usually ignorance of what is best but rather lack of incentives/time/resources to learn what is best then to work to do it

#### Use resources for data 'wisely'

- Match data with your purpose
- Do not collect data you will not use
- Do 'dry-run' analysis with mock data before collection
- Useful data can be qualitative (stories) or quantitative (measured in known units)

# To aid decision-making, not only report but also analyze

- Data does not speak for itself
- Data does not decide, people do
- Analysis is speculating on impact, causes of impact, and drivers of causes that you might control) by combining data with logic, assumptions, and judgment

#### Decisions rest on beliefs of impact

- Objectivity is often illusory
- Personal and professional decisions rarely benefit from 90-percent certainty and randomization. This imperfection if transparent—is OK
- While trying to improve, do not let the (seemingly) perfect be the enemy of the good

### What is 'popular science'?

- Not just academic nor quantitative
- It is transparency about the full path from data to decision and the uncertainties at each step
- Do not fool yourself
- Transparency of flaws/constraints facilitates reasoned discussion that may lead to cumulative improvement
- Difficult, but what alternative?