Citizen Science: Examples and Issues

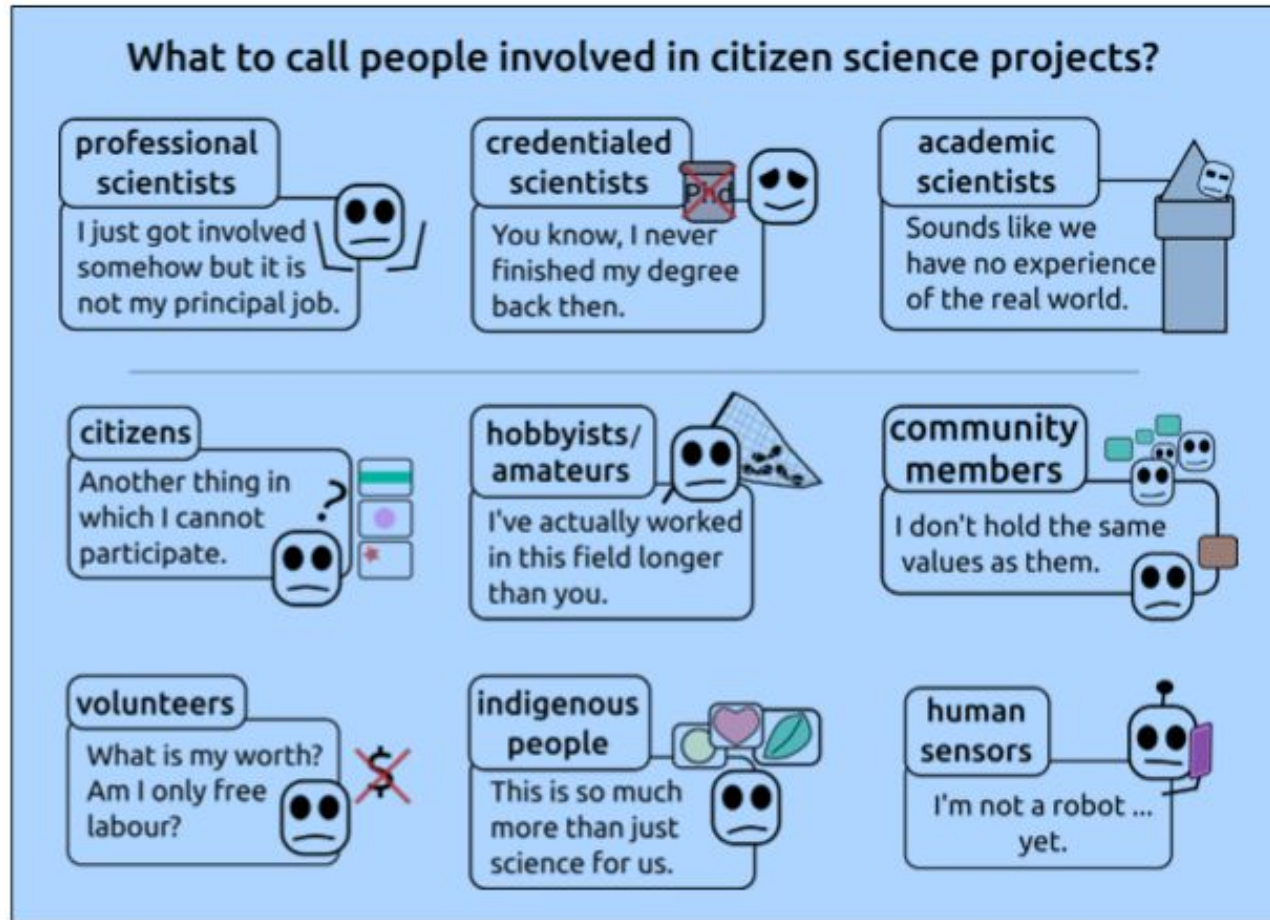Ruth Duerr

Topics

- Citizen Science Terminology Matters
- FAIR and CARE
- Data in the classroom and DataAtRisk.org

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Citizen Science Terminology Matters

Eitzel, M.V. & Oliver, Jessica & Santos-Lang, Chris & Duerr, Ruth & Virapongse, Arika & West, Sarah & Kyba, Christopher & Bowser, Anne & Cooper, Caren & Sforzi, Andrea & Metcalfe, Anya & Harris, Edward & Thiel, Martin & Haklay, Muki & Ponciano, Lesandro & Roche, Joseph & Ceccaroni, Luigi & Shilling, Fraser & Dörler, Daniel & Jiang, Qijun. (2017). Citizen Science Terminology Matters: Exploring Key Terms. Citizen Science: Theory and Practice. 2. 1. 10.5334/cstp.96.

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Citizen Science Terminology Matters: "Scientist Terms"

Table 3: Terms describing scientists who work with citizens in 'citizen science.'

'Scientist' term	Definition	Example	Caveat
Citizen scientist, Scientist-citizen, public scientist, community scientist	Individual with formal science training who is actively engaged in the civic sphere and wants their work to both serve the greater good and do so transparently (Stilgoe 2009)	Citizen scientists investigated anecdotal evidence to construct hypotheses regarding developmental disorders that members of the public claimed were triggered by a MMR vaccine (Stilgoe 2009). Members of Union of Concerned Scientists' Science Network (http://www.ucsusa.org/science-network)	'Citizen Scientist' is easily confused with more common meaning of public involvement in science
Civic educators	Individual who provides information and/or creates educational opportunities for others with the purpose of building a path for greater civic engagement	Researchers, teachers, scientists, issue advocates, journalists, reporters and political campaigners (Ceccaroni et al. 2016)	Closely associated with democratic values, inherently politically laden
Commercial	Individual trained in science with the goal of creating products for profit	Commercial fisher, Commercial scientist	Incentivized by financial profit, rather than 'knowledge for the sake of knowledge'
Credentialed, Trained, Educated	Individual with formal scientific degrees and training	Faculty member at a university	Reinforces the value of formal scientific education

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Citizen Science Terminology Matters: 'Citizen terms"

Table 4: Terms describing the 'citizens' in 'citizen science.'

'Citizens' term	Definition	Example	Caveat
Amateur, Hobbyist	Individual participating in science for non-fiscal personal gain	Amateur Astronomer, Amateur Naturalist	Implies that an individual is not a professional or expert
Anonymous, Non-identified	An individual participating in citizen science that is not identified by name	An anonymous contributor to http://www.myskyatnight.com	Does not credit participants
Citizen	An inhabitant of a particular town or city; a member of the general public in a defined geographic locale	American Citizen, Citizen Soldier	Can also be defined as "a legally recognized subject or national of a state, either native or natural-ized," which is misleading and potentially exclusive in the context of citizen science
Citizen Researcher, Individual Citizen Scientist	An individual leading an activity or performing independent or collaborative research as the lead investigator	Citizen researcher Edward Harris (a co-author of this paper) initi-ated the Scleroderma Education Project	Inherently separates projects from being considered traditional scientific research
Collaborator	An individual working together with a project leader	Participants on www.zooniverse.org are referred to as collabora-tors	Does not specify the level of col-laboration (i.e., what part of the scientific enterprise)

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Findings and Recommendations

- No single term is appropriate for all contexts.
- In a given citizen science project,
  - terms should be chosen carefully and their usage explained;
  - direct communication with participants about how terminology affects them and what they would prefer to be called also should occur.

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How many of you know what FAIR stands for?

(Raise your hand)

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FAIR and CARE

How many of you know what CARE stands for?

(Raise your hand)

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FAIR

Findable

Accessible

Interoperable

Re-usable

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CARE Principles for Indigenous Data Governance

Collective Benefit
- For inclusive development and innovation
- For improved governance and citizen engagement
- For equitable outcomes

Responsibility
- For positive relationships
- For expanding capability and capacity
- For Indigenous languages and worldviews

Authority to Control
- Recognizing rights and interests
- Data for governance
- Governance of data

Ethics
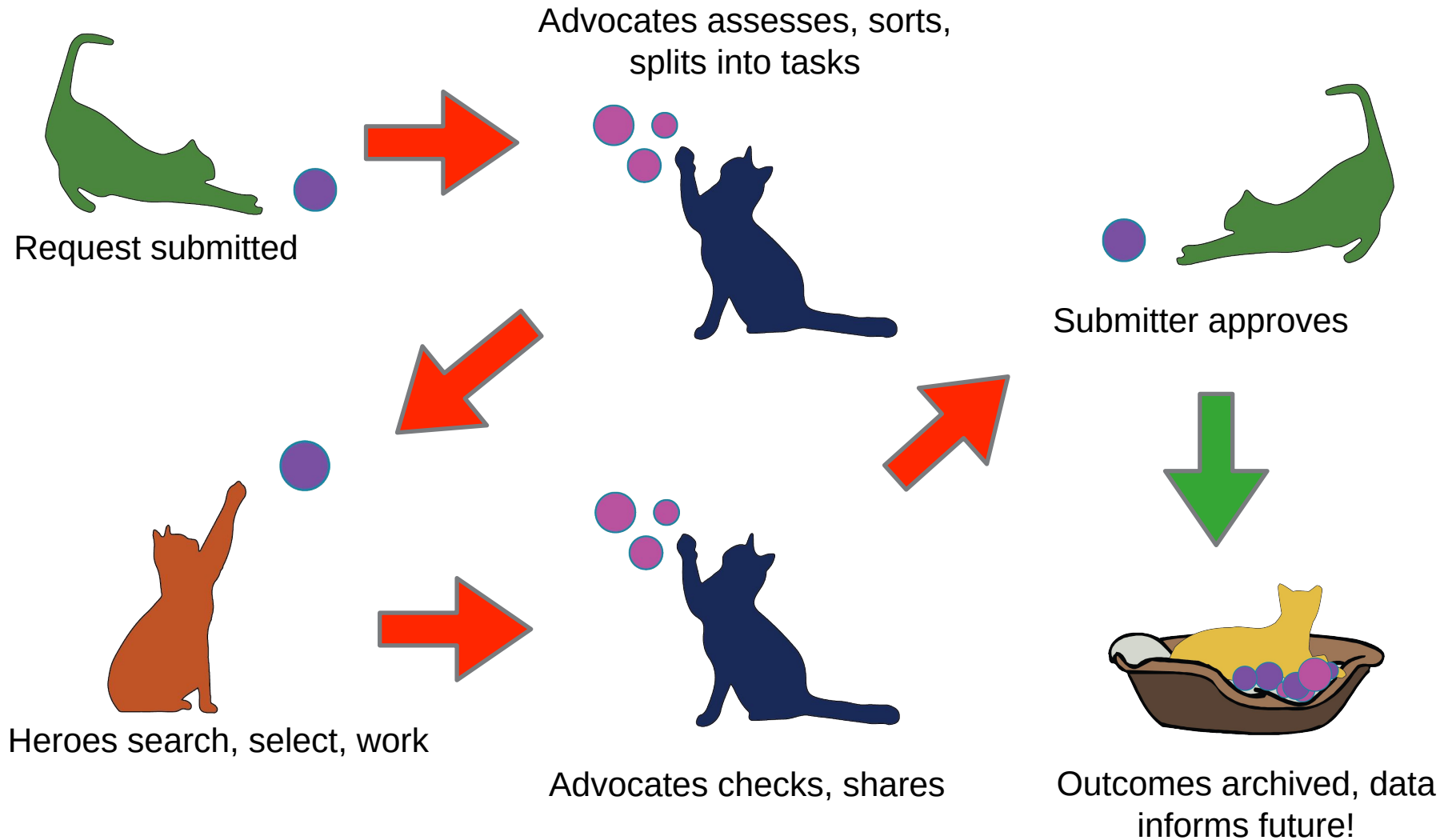- For minimizing harm and maximizing benefits
- For justice
- For future use

https://www.gida-global.org/care

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Lessons Learned

- The days when "scientists" could basically do whatever they wanted with data from, about, etc. "citizens" should be over.
- Reciprocity and win/win scenarios are required
- Ethics and relationship development are key

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Data in the Classroom and DataAtRisk.org

- Taught the fundamentals of data curation at GSLIS for several years
- Required each graduate student to do a data curation project
- Solicited project suggestions from the ESIP community
- The process followed was much like the process being implemented by the At Risk Data Commons

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At Risk Data Commons Envisioned Process at a High Level

Advocates assesses, sorts, splits into tasks

Request submitted

Submitter approves

Heroes search, select, work

Advocates checks, shares

Outcomes archived, data informs future!

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- Not all projects were completed successfully though typically forward progress was made
- Several projects were completed and the repository ingested the updated data and credited the students for their results (e.g., AGU poster)

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- Skills needed for any of these projects varies widely and no one person has all of those skills
- Given adequate support most people, irrespective of their background, can contribute meaningfully in areas that match their skills

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