Creating a Culture of Research Security in the Age of Open Science

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$$\text{Global Competitiveness} \propto \frac{\text{Capabilities and Investments}}{\text{Threats/Interference}}$$

Four Key Terms for our Session Today

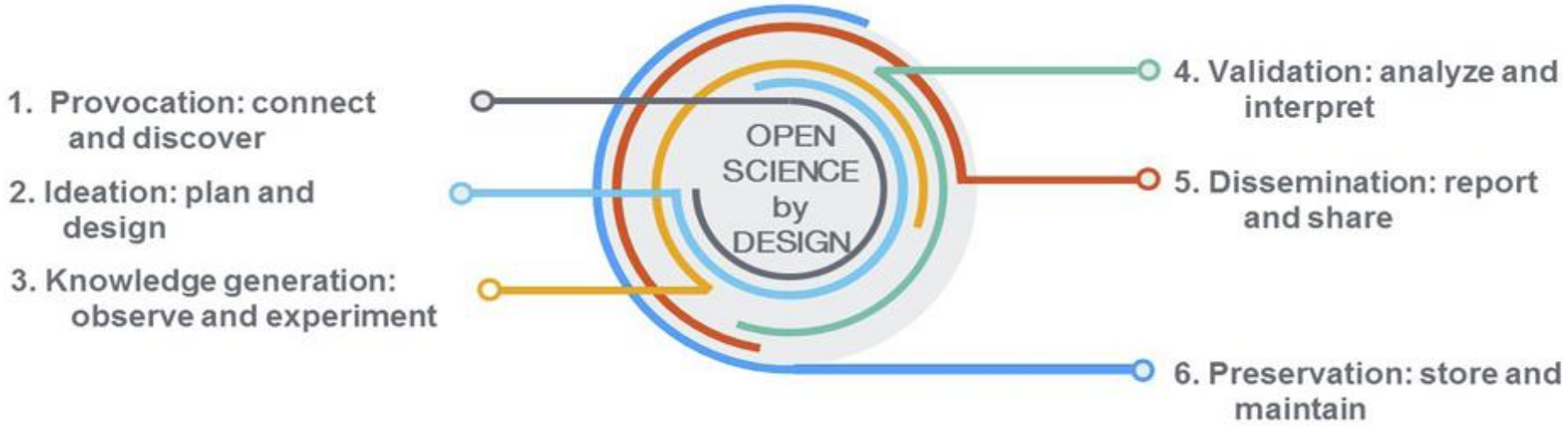
- Open Science
- Research Security
- Research Integrity
- Culture

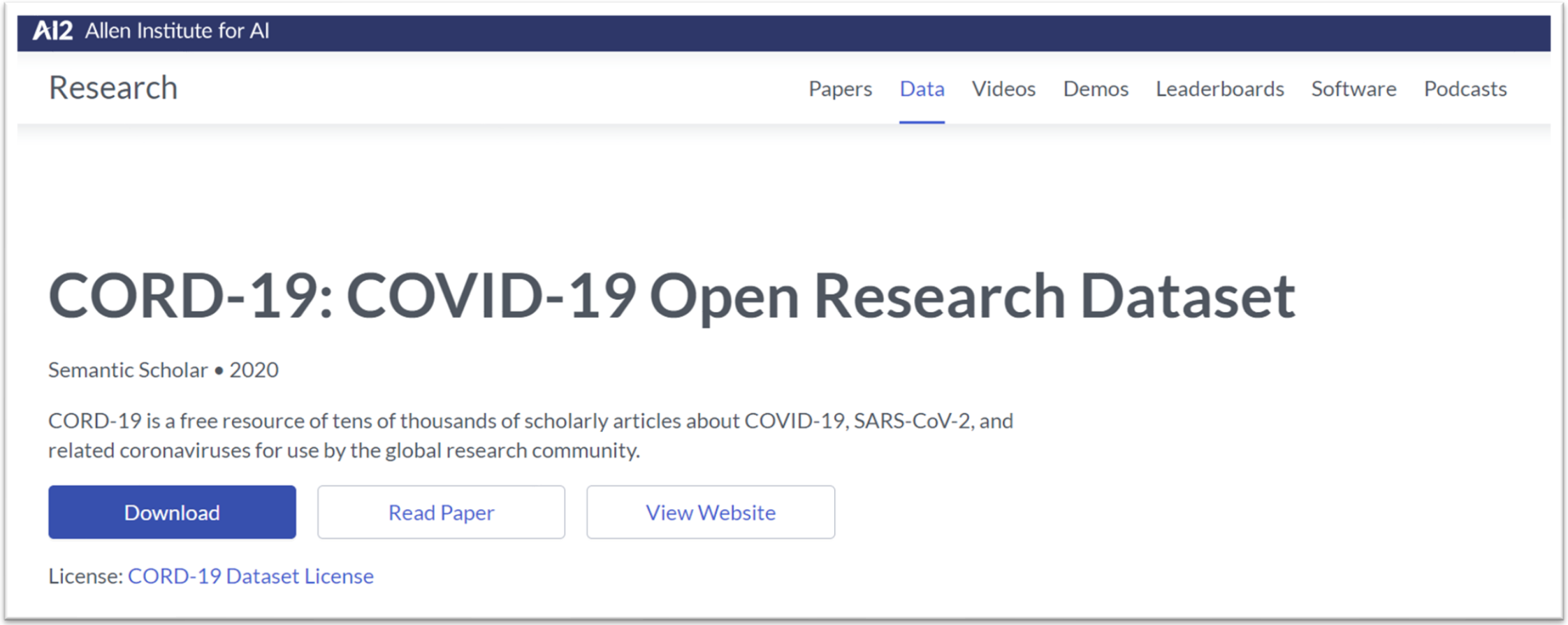
Open Science

- “The principle and practice of making research products and processes available to all, while respecting diverse cultures, maintaining security and privacy, and fostering collaborations, reproducibility, and equity.” (White House Office of Science and Technology Policy, 2023)
- “The free availability and usability of scholarly publications, the data that result from research, and the methodologies, including code or algorithms, that were used to generate those data.” (National Academies of Science, Engineering and Medicine, 2018)

Open Science – Different than but Related to

- Open Access
- Public Access
- Open Science (by Design) leads to better science (NASEM 2018)

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Research Security

- “Safeguarding the research enterprise against the misappropriation of research and development to the detriment of national or economic security, related violations of research integrity and foreign government interference.” (National Science Foundation)

Research Integrity

- “The use of honest and verifiable methods in proposing, performing and evaluating research; reporting research results with particular attention to adherence to rules, regulations and guidelines; and following commonly accepted professional codes or norms.” (National Science Foundation)

(Institutional) Culture

- “The integrated pattern of our knowledge, beliefs, values, structures, behavior, and products of behavior that we can learn and pass on to others.” (Byrne 1998)
- “The collection of beliefs, values and methods of interaction that create the environment of an organization.” (Indeed.com)

Characteristics of Institutional Culture (Watkins 2013)

- Consistent
- Involves repeatable patterns of behavior
- Is shaped by incentives
- Involves jointly-held beliefs and interpretations
- A carrier of meaning (shared view of what is, why is)
- Form of protection
- Shaped by and overlaps with other cultures
- Never monolithic
- Dynamic

Examples of Institutional Culture

- Strong athletics programs
- High value given to all disciplines
- Strong emphasis on instruction/learning/mentoring
- Faculty-centered governance
- Highly diverse
- Highly risk averse

(Institutional) Culture

- "The integrated pattern of our knowledge, beliefs, **values**, structures, behavior, and products of behavior that we can learn and pass on to others." (Byrne 1998)
- "The collection of beliefs, **values** and methods of interaction that create the environment of an organization." (Indeed.com)

(Research) Values

- The principles by which we operate
- Always there to renormalize us when disagreements occur or confusion arises
- Uncompromising – absolutely necessary and an inseparable dimension of research
- Our North Star

(Research) Values

- Honesty
- Integrity
- Transparency
- Accountability
- Openness
- Freedom of inquiry
- Sharing
- Collaboration
- Merit-based competition
- Mutual respect
- Fairness
- impartiality
- Inclusivity
- Objectivity
- Civil debate
- Reciprocity
- Principled international collaboration

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$$\text{Global Competitiveness} \propto \frac{\text{Capabilities and Investments}}{\text{Threats/Interference to our VALUES}}$$

Because values underpin the research process, threats to our values translate into threats to research itself and to the openness that is essential for research to advance

So…How Do We Create a Culture of Research Security in the Age of Open Science?

- How does culture change?
- Sometimes by virtue of a crisis or a disruptive influence
  - Internet, smartphones, COVID, AI
- Sometimes by an evolving situation including geopolitical changes

The Key: Recognizing that Values and Culture are Strongly Linked

- Culture is a product of leadership, information, open and effective communication, vision, goals, rationale and trust
- Changing a culture can be done mechanistically, which is relatively fast (new rules)…
- …or it can be done by leading with and promoting values, which is slower but almost always better

Values are the Heartbeat of Research Security

Changing the Culture

- Open science is not antithetical to research security and research security need not impede open science
- The culture change will happen as the **research community**…
  - Is more informed about the nature & pervasiveness of research security threats/challenges and their consequences → builds trust
  - Has access to risk-based decision-making information
  - Sees personal value in research security measures
  - Emphasizes values, consistent with the research process itself

Changing the Culture

- The culture change will happen as **funding agencies**…
  - Stand up additional processes and training to help researchers avoid breaching rules (e.g., disclosures)
  - Support efforts to better understand the many facets of research security (e.g., nascent NSF Research on Research Security program)
  - Harmonize research security program requirements
  - Continue moving forward with open access capabilities
  - Continue using community feedback to adjust policies