



Social Justice, Community Engagement  
and Information Institutions

# Data Literacy as a Human Right: Roles and Responsibilities of Librarians as Datamediaries

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Data Capitalism  
 Dataclysm  
 Interactivity  
 Data Deluge  
 Data Explosion  
 Datafication  
 Data Revolution  
 Connectivity  
 Access

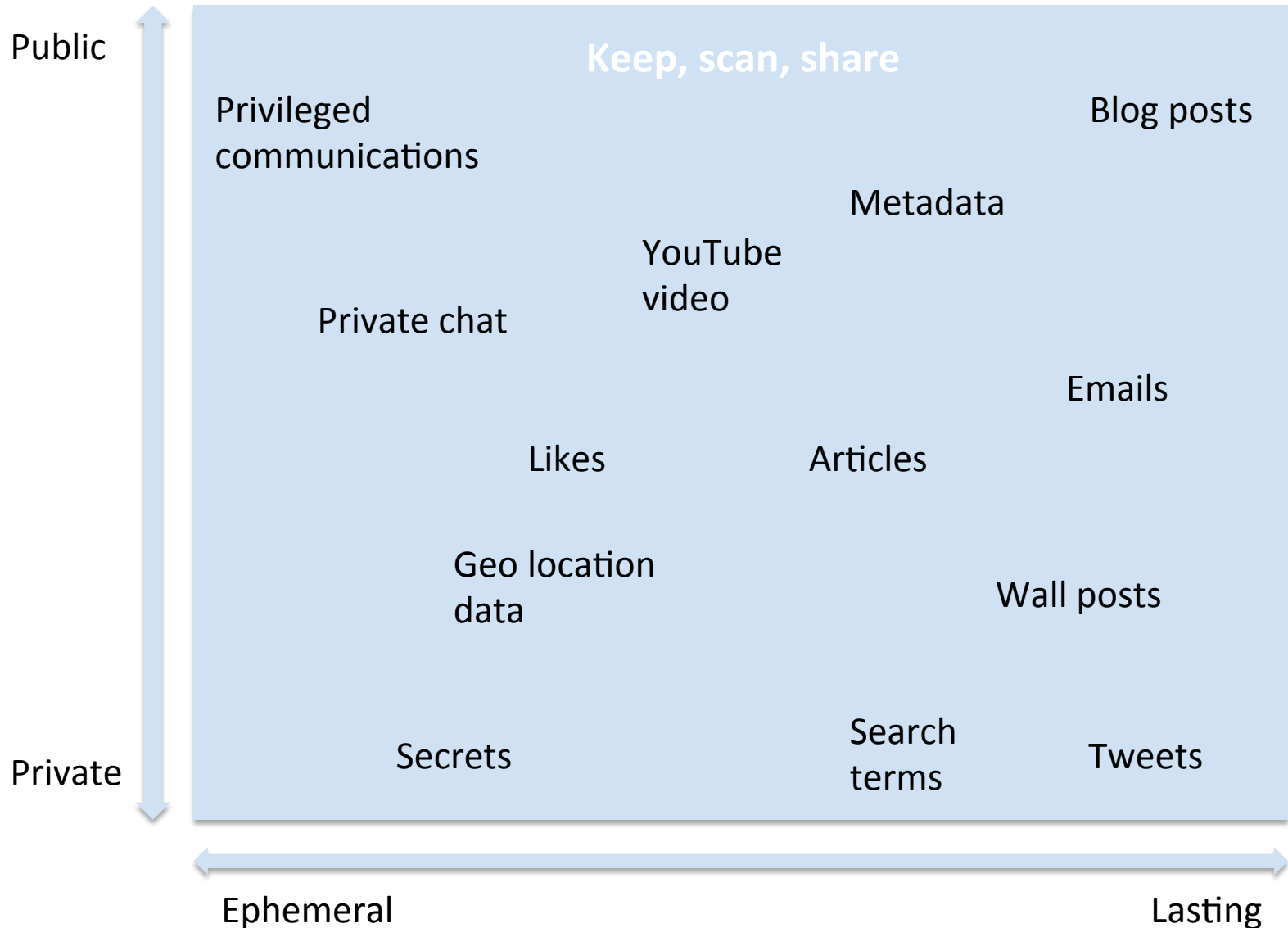
# Big Data in the Network Society

Data Double  
 Data Fluency  
 Data Privacy  
 Data Protection  
 Learning Analytics  
 Data Literacy  
 Data Security

Prodsusage  
 Precision Medicine  
 Data Refineries  
 The Quantified Self  
 Data Warehouses  
 Smart Cities

# User Data on Proprietary Platforms Today (Taylor 2016, 8)

Facebook, Google (local), YouTube, Wikipedia, Yahoo, Amazon (local), Twitter



# Study Design

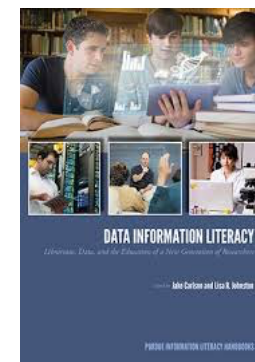
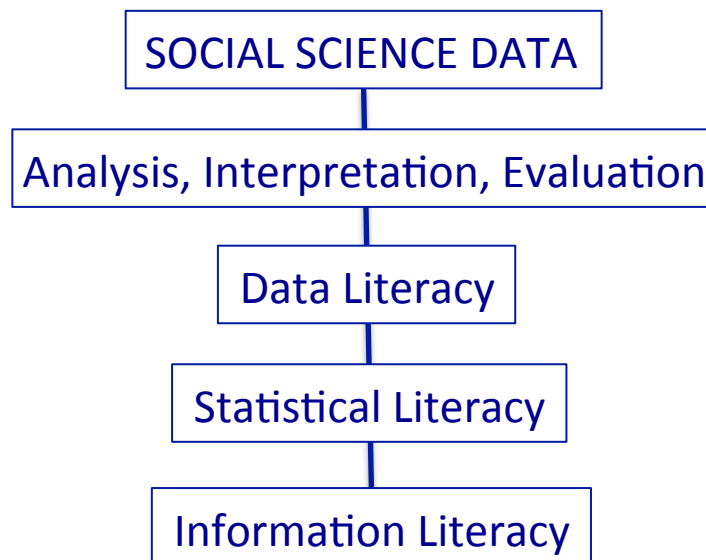
## Research questions

- What does it mean to be data literate in the contemporary digital world?
- Who are the critical stakeholders for the data literacy movement?
- How should libraries respond to the data literacy challenge?

## Theoretical frameworks

- Radical Change Theory (Dresang 1997, 2005, 2006; Dresang and McClelland 1999; Dresang and Koh 2009)
- Theory of Stakeholder Identification and Saliency (Mitchell, Agle and Wood 1997)
- Intellectual Capital:
  - Intellectus Model (Bueno, Salmador and Rodriguez 2004)
  - Overextension Strategy (Itami 1987)

# What Does it Mean to be Data Literate in the Contemporary Digital World?





# Kinds of Data – Diversity of Characteristics

## Form

- Quantitative
- Qualitative

## Structure

- Structured
- Semi-structured
- Unstructured

## Source

- Captured
- Derived
- Exhaust (by-products)
- Transient

## Producer

- Primary
- Secondary
- Tertiary

## Type

- Indexical
- Attribute
- Metadata

## Access

- Closed
- Shared
- Open



# Theories of Literacy – Evolution of Meanings

## A skillset

- Reading, writing, oral
- Numeracy (component or supplement)
- Other enabling skills (multiple literacies)

## An applied practice

- Universally applicable (functional literacy)
- Socially and culturally situated (new literacy)

## A learning process

- Active and broadly-based
- Individuals making sense of their experiences (constructivist learning)
- Groups transforming their communities (critical reflection)

## Subject matter

- Texts produced and used by literate individuals

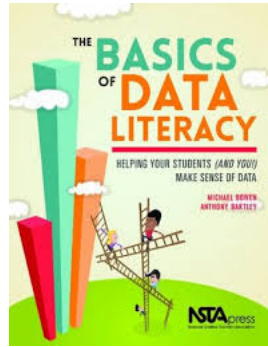
Technical → Critical, Product → Process, Individual → Social



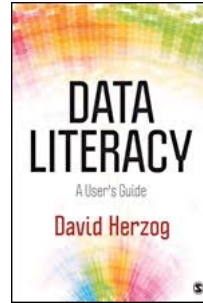
# LIS Conceptions of Data Literacy

- Various presented as an integral part, component/ subset, offshoot, or complement to information literacy
- Emerged from social science dataset community, added qualitative elements to statistical/quantitative literacy
- Expanded definitions for e-science/research (SDL, DIL), emphasized metadata and curation for producer role
- Current work in school and public libraries promoting a lifewide view of youth data literacy and personal DM
- Other projects exploring data literacy for open civic/ government data in public and academic libraries
- A few cross-sector activities (e.g., academic-school/ public/business), but mostly sector-/context-specific
- Some awareness of need to support learner transitions from school through higher ed. to work and citizenship

# Alternative Conceptions of Data Literacy

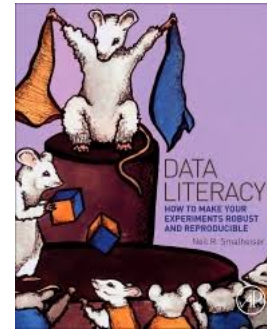


2013



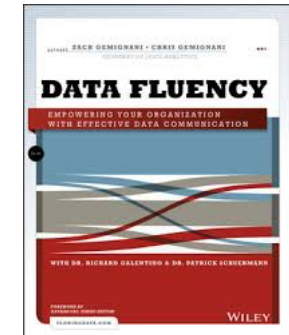
2016

UG Research Skills  
(Secondary Data)

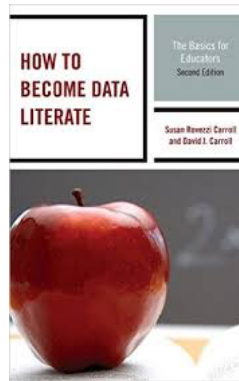


2017

PG Research Methods  
(Primary Data)

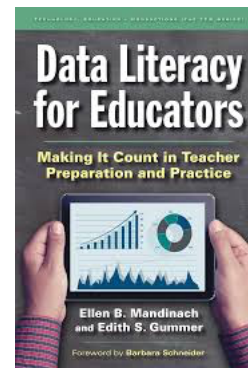


2014

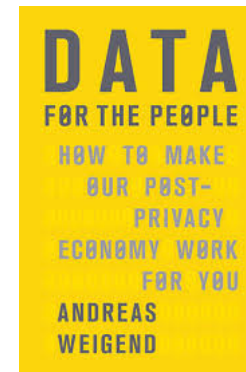


2015

Statistical Literacy



2016



2017

Data-Based Decision Making



# Sample Definitions of Data Literacy

## Journalism

“the ability to consume for knowledge, produce coherently and think critically about data. Data literacy includes statistical literacy but also understanding how to work with large data sets, how they were produced, how to connect various data sets and how to interpret them” (Gray, Bounegru and Chambers, 2012, 148)

## Business

“the ability to read, write and communicate data in context, including an understanding of data sources and constructs, analytical methods and techniques applied, and the ability to describe the use case, the application and resulting value” (Gartner 2018)



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# Who are the Critical Stakeholders for the Data Literacy Movement?



International Association for Social Science  
Information Services & Technology



INSTITUTE of  
**Museum and Library**  
SERVICES





ASSOCIATION of PUBLIC DATA USERS

1975



WORLD DATA SYSTEM

2008



2008



2011

DataKind

2011

UK Data Service



2012



2013



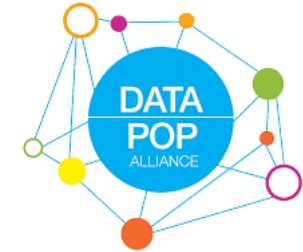
2012



1950



2012



2013



DATA CARPENTRY  
BUILDING COMMUNITIES TEACHING UNIVERSAL DATA LITERACY

2013

DATAETHICS

2015

PITTSICI



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# How Should Libraries Respond to the Data Literacy Challenge?

“information literacy and data literacy form part of a continuum, a gradual process of scientific-investigative education that begins in school, is perfected and becomes specialized in higher education and forms part of individuals’ skill set throughout their lifetime”

(Prado and Marzal 2013, 126)



# Libraries as Community Datamediaries

From an intellectual capital perspective, libraries have the educational know-how (human capital), organizational and technological infrastructure (structural capital), professional networks and community engagement (relational capital) to play a leadership role in data literacy.

By partnering across traditional sectoral boundaries, and building on successful innovations in information literacy, they can engage in collaborative learning-by-doing and reach beyond their current capability for social benefit.

Transferable practices include LibGuides, online tutorials, MOOCs, cross-sector instructional partnerships, and navigating information literacy via multilife perspectives + UNESCO primer + UNESCO declaration...

## References

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# Questions & Suggestions

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