

The International Collaboration for Research on

STATISTICAL REASONING, THINKING AND LITERACY



## Preliminary Announcement

### The Thirteenth International Research Forum on Statistical Reasoning, Thinking and Literacy (SRTL-13)

25 June - 1 July 2023

Hosted by University of New England, Australia

### Theme: Reconceptualising data and data-ing

#### SRTL

The International Collaboration for Research on Statistical Reasoning, Thinking, and Literacy (SRTL) was established in 1998 to cultivate a community of researchers and statistics educators who share the passion of studying the nature and development of students' statistical literacy, reasoning and thinking, and exploring the challenges posed to educators and researchers at all levels in supporting learners to achieve these goals. Today, SRTL offers scientific gatherings for statistics education researchers every two years.

The SRTL research forums have unique features, such as a small size (around 25 participants), that allow time for in-depth presentation and discussion of research. There is extensive use of videos to present how learners solve problems and reason with statistical information, concepts and processes in classrooms or during interviews. Forums include a statistician-in-residence in addition to the educational researchers in order to provide the perspective of the discipline and to give feedback on the research presented. Participants present, discuss and argue about research related to these topics in a format that facilitates becoming acquainted with key researchers and viewing their work in progress in a stimulating, positive and enriching environment. The SRTL research forums have led to many frontier publications that present new research, synthesise and build on previous research, and form connections among related work in other disciplines (Garfield & Ben-Zvi, 2015; Ben-Zvi, Makar, & Garfield, 2018).

#### Data and data-ing

Statistics education has been shifting in recent years to acknowledge how people encounter contemporary data in their lives. Whether they be children, everyday citizens or professionals, the forms, practices and sources of data are often more complex than those taught in schools and introductory university statistics (Gould, 2021).

Many ubiquitous forms of data do not clearly fit the sample-population assumptions that underpin statistical reasoning. For example, data collected in real time (GPS, live traffic, tweets), image-based (photographs, drawings, facial recognition), semi-structured (scraped from social media posts), repurposed (school testing data to estimate housing prices) and big data (open access internet data, civic databases) are all examples of non-traditional data. ... [The] widespread availability and access to myriad non-conventional, repurposed, massive or messy data sets necessitate broadening educational knowledge to better understand how

learners make sense of, model, analyse and make predictions from these data. (SRTL12 final announcement, 2021, p. 8)

Importantly, data have been increasingly accessible for empowering communities and providing evidence of injustice that facilitates advocacy (Dove, 2022; Rowen, 2018; UNESCO, 2015). Our work in the previous Forum, exploring non-conventional data, highlighted how much more there is to learn from data when we consider how data, data sources and access have changed.

Looking back over our twelve forums, the work has gone through a number of evolutions, starting with defining (SRTL1-2) and investigating (SRTL3-4) specific approaches to statistical reasoning (e.g., variability, distribution, sampling, chance), aspects of inferential reasoning (SRTL5-8), statistical modelling (SRTL9-11) and finally non-conventional data (SRTL12). A new era is pushing the field to broaden its horizons. Like the observation that models and modelling cannot be separated epistemologically and hence pedagogically, it's time to build on the previous forum to (re)consider what we mean by **data – and data-ing**. The pair data and data-ing refers to a similar conceptualization of the relation between sample and sampling, or model and modelling, where the first is the statistical concept and the second refers to processes of engaging or reasoning with this concept.

By focusing on data and data-ing we acknowledge a range of elements in terms of the nature, format, source, purposes, processes, generation, contexts, users/access, ethics, visualisation and/or interdisciplinarity that come with learning from/with data. Furthermore, the idea of data-ing can highlight how those who engage with data can draw on their knowledge, purposes, experiences, tools and peers to make sense of and use data.

### SRTL-13

The Thirteenth International Forum for Research on Statistical Reasoning, Thinking and Literacy (SRTL-13) will build on work in previous Forums (particularly around non-conventional data, statistical modelling and informal statistical inference) to re-think and discuss how statistics education research can assist learners to make sense of and reason with data in its many forms and contexts.

Maintaining SRTL's focus on video-rich qualitative research that aims to understand learners' reasoning and thinking with data and its implications, we will consider questions such as:

#### *Learners' reasoning with complex data*

- How must we reconsider statistical thinking/reasoning in light of new forms, processes and contexts around data and data-ing?
- How do learners engage with, structure, wrangle and negotiate complex data, processes or contexts to achieve their purpose?
- In what ways do data structures influence how learners engage in complex data scenarios?
- What new insights about a problem/phenomenon can technologies enable through innovative simulations and/or visualisations of data?

#### *Teaching and learning*

- How do teachers come to develop their reasoning and dispositions about using complex data or engaging in data-ing?
- How does the epistemological relationship between data and data-ing affect pedagogical approaches or designing the learning environment or tasks?
- What assessment tasks and measures can be constructed to assess progress in data-ing?

- What role does computational thinking, interrogating data sources or (re)purposes, perspective of data as non-neutral, valuing ethics, or acknowledging new assumptions (e.g., impact of personal beliefs or bias) about data play in how we re-shape the statistics curriculum?

#### *Affect and agency*

- What is the role of argument when students or citizens use data and data-ing to seek insight into contexts they care about?
- What can we learn about the ways that learners' dispositional outcomes, stories or sense of self evolve when working with data contexts that are meaningful to them?
- How could we broaden participation of underserved people in data science and statistically-rich contexts?

#### *Broader questions for the field*

- What do citizens need to know and be able to do to access and make sense of contemporary data?
- How can research in statistics education and data science education inform one another about data and data-ing, acknowledging the different purposes (or repurposes) and contexts in which data are created and deployed?
- How do new ways of accessing or using data allow engagement with more interdisciplinary issues, possibly including developing research questions?

### Call

**Expression of interest** to attend the conference can be submitted before **October 21, 2022** to [SRTLmailbox@gmail.com](mailto:SRTLmailbox@gmail.com).

Participation in the SRTL-13 Forum can be as a *presenter* or as a *discussant*. *Presenters* are asked to send a brief letter of introduction of yourself (if new to SRTL) and a two-page overview of work-in-progress relevant to the theme of the Forum, addressing: introduction, literature review and/or theoretical framework, methodology, expected results, and your practical and theoretical contribution to the theme. The overview should particularly emphasise the perspective of data and data-ing you are addressing in your proposed presentation. Note that presentations are *intentionally* on incomplete, rather than polished work and are aimed to provoke discussion about the theme.

*Discussants* are experienced SRTLers who will actively participate in all sessions and discussions and will share their own reflections and insights in a panel on the concluding day. Discussants are asked to send a brief letter with a formal expression of interest.

### Key preliminary dates:

- October 21, 2022: Expression of interest due
- November 2022: Response to Expression of Interest
- December 15, 2022: Extended abstracts due, if requested
- January 2023: Decision on acceptance
- May 1, 2023: Registration and preliminary paper for forum (front end of a full paper)
- 25 June-1 July, 2023: SRTL-13 held<sup>1</sup>

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<sup>1</sup> Participants may be interested in continuing on to the 45<sup>th</sup> annual conference of the Mathematics Education Research Group of Australasia (MERGA) conference in Newcastle, Australia (just north of Sydney) 2-6 July, 2023. Further details later from [www.merga.net.au](http://www.merga.net.au).

**SRTL-13 Local Organising Team:**

Jill Fielding ([jill.fielding@une.edu.au](mailto:jill.fielding@une.edu.au)), the University of New England, and Katie Makar, The University of Queensland.

**SRTL-13 Location**

Australia (specific location TBC).

**References**

- Ben-Zvi, D., Makar, K., & Garfield J. (Eds.) (2018). *International handbook of research in statistics education*. Singapore: Springer.
- Dove, G. (2022). *Learning data science through civic engagement with open data*. Presentation at the Paderborn Colloquium on Data Science and Artificial Intelligence in School, 12 January 2022 (online). <https://www.prodabi.de/colloquium>
- Garfield, J., & Ben-Zvi, D. (2015). The International Collaboration for Research in Statistical Reasoning, Thinking, and Literacy (Foreword). In A. Zieffler & E. Fry (Eds.), *Reasoning about uncertainty: Learning and teaching informal inferential reasoning* (pp. xv-xviii). Minneapolis, MN: Catalyst Press.
- Gould, R. (2021). Toward data-scientific thinking. *Teaching Statistics*, 43, S11-S22.
- Rowan, R. (2018). Open-source technical communication in the classroom. In G. Y. Agboka and N. Matveeva (Eds.), *Citizenship and advocacy in technical communication: Scholarly and pedagogical perspectives* (pp. 265-284). Routledge.
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- United Nations Educational, Scientific and Cultural Organization [UNESCO] (2015). *Global citizenship education: Topics and learning objectives*. UNESCO. <http://unesdoc.unesco.org/images/0023/002329/232993e.pdf>