



TWG07 Adult Mathematics Education(AME)

David Kaye

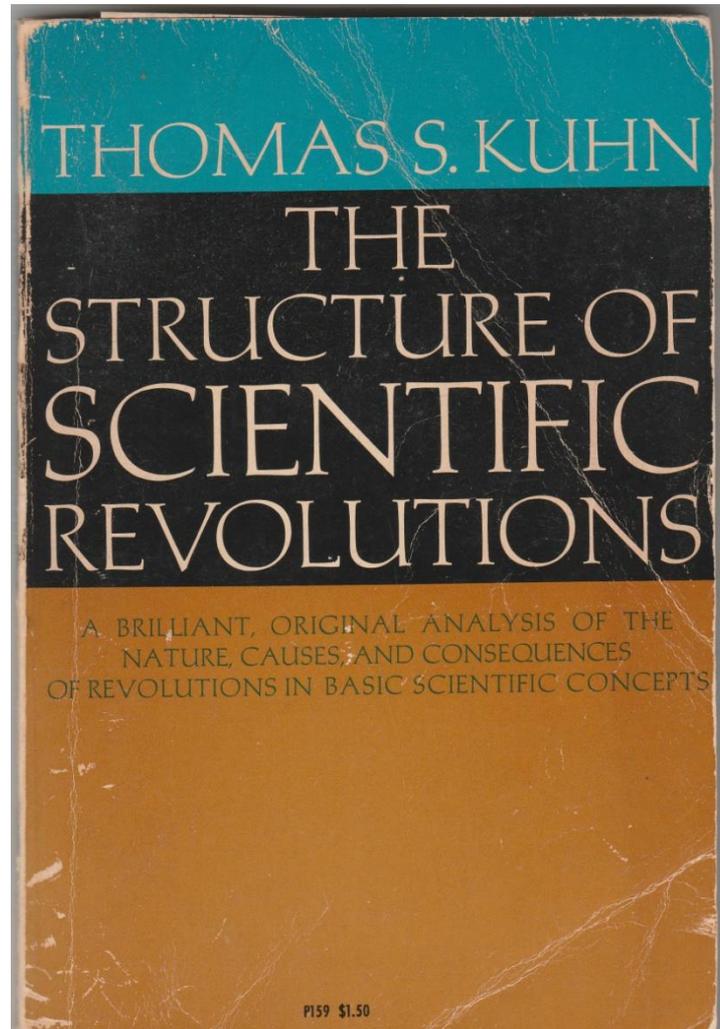
Adult numeracy – a paradigm shift?

Beginnings

An idea that has been with me for many years

- Origins from a long time ago whilst studying history of science
- Since teaching adults numeracy have been involved in the debate about mathematics and numeracy
- Now bringing the two together

Paradigm



Paradigm

The transition from a paradigm in crisis to a new one from which a new tradition of normal science can emerge is far from a cumulative process, one achieved by an articulation or extension of the old paradigm. Rather it is a reconstruction of the field from new fundamentals, a reconstruction that changes some of the field's most elementary theoretical generalizations as well as many of its paradigm methods and applications.

Paradigm change

Incommensurable

Lexical change

Defining numeracy (1982)

- 'We would wish 'numerate' to imply the possession of two attributes. The first of these is an 'at-homeness' with numbers and an ability to make use of mathematical skills which enable an individual to cope with the practical mathematical demands of his everyday life. The second is ability to have some appreciation and understanding of information which is presented in mathematical terms, for instance in graphs, charts or tables or by reference to percentage increase or decrease
- Cockcroft (1982: para 39)

Defining numeracy (2008)

- From this definition we derived the concept of a 'numeracy incident'. The quantitative aspect of the world around us takes many forms. It shows up in artefacts and devices (meters, gauges, clocks, numbers, symbols), in constructions (measurements, angles, spatial attributes) and in texts (numbers, symbols, diagrams, maps, graphs, formulas).
- Kees Hoogland (2008)

Defining mathematics

- Pure mathematics
- Applied mathematics
- School mathematics
- Vocational mathematics
- Ethnomathematics
- Math(s)

Numeracy again (2020)

- Adult numeracy is a construct related to the ways people cope with the many mathematical, quantitative, and statistical demands of adult life. Some definitions of *numeracy emphasize basic* computational skills or focus on emergent numeracy at a young age. In this paper, however, numeracy is used broadly to encompass a set of diverse skills, knowledge-bases, dispositions and affect, communication abilities, and practices and behaviours, that range from simple to very advanced, relate to mathematics and statistics, and that individuals need or use in order to engage and manage diverse life situations and tasks in the adult world.
- Gal et al., 2020, p. 378

A new paradigm

- I have applied the concepts of incommensurability and lexicon fluidity to the ongoing debate about adult numeracy.
- By combining this theoretical approach with a well informed account of defining adult numeracy I am making the claim that adult numeracy research represents a **paradigm change** in the context of mathematical education research.
- There have been repeated attempts to explain and explore adult numeracy with the incommensurable lexicon of pure mathematics and its related educational processes, which have failed.

Paradigm debates

- “But paradigm debates are not really about relative problem solving ability Instead, the issue is which paradigm should in the future guide research on problems”
- Kuhn et al., 2000, p. 156

The future

- This can only become really apparent if future research recognises the lexical divergence and with more and more researchers and practitioners using the new taxonomy, a new branch of education research evolves as does a new species through Darwinian evolution. **A new habitat or niche is defined where adult numeracy can grow freely** (Kuhn 2002, pp. 97-99)