

Invited Commentary

Polarising Qualities of Systems Thinking

Ian Roderick, The Schumacher Institute, Bristol, UK

I have often noticed the use of categorising as a technique to describe how people behave or think differently. For example, introvert versus extrovert or progressive versus reactionary. Categories are constructs or styles of dealing with the world that have arisen from text and narrative sometimes backed up by analysis or statistical survey. They are ways of generating language to help explain thoughts and as long we beware of the fallacy of misplaced concreteness they are excellent tools for explanation and illustration.

The simplest scheme is to have just two categories and to have no doubt about which category your 'elements' fall into, for example with a few exceptions people are either male or female. This polarises the population; it is bipolar in this case. A well-defined example of a multipolar division is putting people into age brackets. It is well defined, as the boundaries are precise to the day or even hour and minute. But we begin to get hints of a problem. Many people like to consider themselves in the same age group as the one beneath the absolute numerical one they fall into, at least until they strain credibility. It is when things are not clear-cut that polarisation into categories leads to tensions and resistance.

It is the nature of the qualities that we are distinguishing that counts. So often we are dealing with sliding scale qualities, an element is neither at one end or the other, but it is somewhere in the middle and sometimes past the ends. Consider feminine and masculine qualities instead of female and male. Not only do we have a problem of situating a person on a scale for which we have no metric, no absolute points and no universal standard but also our element moves about as they engage in different social contexts. To add to any misconception that we can easily categorise we have the added problem of compound qualities. Feminine and masculine are adjectives that combine a multitude of other dual adjectives soft - hard, emotional - rational, connective - insular and so on. These are all qualities that make up this bigger concept expressed through two powerful polarised descriptions.

However, what has this got to do with systems thinking? Well I took a list of adjectives or qualities of systems thinking that have collected and I tried to develop some polarisations.

To make it easy I have kept to two poles that I have called loose and tight for each quality. I have considered systems thinking as 'loose' and its opposite, probably something like empirical physics, as 'tight'.

Table 1 shows the first attempt at a table, I do hope you disagree with some of this.

These polarising qualities in Table 1 can easily be described as dual fuzzy sets. For example, we could consider the set of research projects that have a loose discipline style and the set of projects that

Table 1. List of polarising qualities

Quality / Adjectives	Loose	Tight
Structure	Unplanned, unfocused, self-generating rules, serendipitous	Pre-planned, clearly defined, well focused, prescriptive, algorithmic
Scope - relevance	Specific to a place and time and only for the set of people involved	General, applies everywhere, for always and for everyone
Entropy	Constructive and creative, integrative - only breaks down in order to reconstruct an improved version. The clock is now working and telling time more accurately	Destructive, reductionist. The clock is in pieces with all parts clearly labelled and their purpose explained
Activity chronology	Cyclical, networking, parallel activities, Multiple feedback loops	Linear, sequential steps. Single feedback loop
Diversity and richness	Encourages wide-ranging inputs	Tries to minimise inputs and their influence
Discipline style	Multiple, integrative, unifying	Specialised, divisive, categorising
Judgement (assessment)	Internally assessed by results for the participants and by the participants.	Externally assessed by peer group
Teleology	Intention to change	Intention to understand
Time endurance	For the moment, any conclusion or action is only valid at the time it is made	Permanent - conclusions and results stand forever (until disproved)
Probability	Relies and encourages chance, stochastic	Seeks to eliminate chance, deterministic
Gender polarity	Feminine	Masculine
Personality (or nationality)	Experimental, individualistic, eccentric, entrepreneurial e.g. Anglo-Saxon, Caribbean, Indian	Conforming, obedient, conventional e.g. German, Continental, Japanese
Cleanliness	Dirty and messy	Neat and tidy
Political	Democratic - proceeds by consensus	Autocratic - dictated by the rules of the game / nature
Language	Adjectives and adverbs. Emotions and feelings	Nouns and verbs. Facts and figures
Argument	Analogy, illustration, metaphor, presentation, advocacy, adduction	Definitions and logic, deduction
Mathematics	Topology, fuzzy sets, patterns, statistics	Numbers, graphs, algebra, calculus, and trigonometry

have a tight discipline style. Any particular project that veered towards looseness could be described as belonging 80% to the loose set and 20% to the tight.

Fuzzy logic has seen success in engineering control system particularly for information feedback in non-linear systems that exhibit extreme sensitivity to small changes. If action research is an inquiry approach with a grounding in system thinking which includes an awareness of social feedback mechanisms, then the qualities we may want to consider that make up this feedback, could be described using dual fuzzy sets.

This is not an attempt to quantify in any traditional scientific way, turn systems thinking into hard data to feed a control computer. The key to using fuzzy logic is the estimation of belongingness (for example how much is this sunset a member of the set of glorious red sunsets). This estimation is a

subjective task, within an inquiry process it should be valid to make these estimations in participation and indeed to examine differences in estimation is often the essence of argument and debate - on the way to consensus or greater understanding we hope.

As an example, in a hospital we may be concerned at the cleanliness of wards and we have a systems inquiry to address this problem. The participants may all examine different places and estimate how much they belong in the set of clean places as distinct from dirty places. A comparison of these estimates may reveal distinct differences and the inquiry can explore these and find that the concepts of cleanliness are very different between the cleaner and the theatre ward manager.

The post-modern philosophic worries about polarisation or categorisation seem to centre on trying to discover what meanings exist in separating and classifying. Do we mean to value one set over another, do we mean to initiate conflict, do we mean to confuse, do we mean to exclude some from any category, do we mean to box things up neatly so that we can ignore them? In a paragraph above I have said "...with very few exceptions people are either male or female, this polarises the population..." am I trying to exclude a good friend of mine because of my fear, the threat to my masculinity. To deconstruct why we categorise or separate into binaries is an attempt to reveal these underlying subtexts.

These worries are valid and a post-modern feminist view of the polarising qualities in the table above would clearly identify the association of a 'tight' research methodology with a masculine hegemony.

Perhaps, whenever we are tempted to devise categories we should pursue this deconstruction at least down one level. It should be possible to examine critically the meanings behind and within the categories and the process of forming them but having done that move on to use them with a better understanding of their potential dangers and failings. The best often fall between the cracks.

Categories are ways to construct difference and difference creates boundaries. Boundaries are at the heart of systems thinking – it is where interesting things happen.