Systems Thinking for Community Involvement in Policy Analysis

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1 Emergent Publications

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Abstract

This paper is the text of a presentation to the 1st International Workshop on Complexity and Policy Analysis delivered by Gerald Midgley and transcribed and edited by Kurt Richardson. It charts the development of systems thinking since the 1960s, identifying a number of different systems paradigms. These are then compared with paradigms in complexity research, and significant parallels are identified. It is argued that there are several interacting research communities (including those writing about complexity, systems thinking and cybernetics) that have the potential to learn from one another. A research program on systemic intervention is then presented, focusing on the need to think critically about boundaries and values as a means of dealing with the inevitable lack of comprehensiveness in systemic interventions. A rationale for methodological pluralism is also given. All through the paper, the theoretical and methodological ideas are illustrated with practical examples.

Introduction

I would like to start by thanking you for inviting me. I feel quite privileged to be invited to a complexity conference, given that I haven't made much of a contribution to complexity thinking at all, being primarily engaged with the systems community. But my hope is that there can be learning across these two communities, and that's one of the things I want to talk about today.

My talk is called "Systems Thinking for Community Involvement in Policy Analysis", and over the years I have talked with numerous audiences, particularly in the areas of management and community development. Some approaches that I've used are adaptable across domains, so I'm hoping that what I say will have some relevance to policy.

I want to start by acknowledging some of the history of policy analysis because, as I understand it, in the 1960s policy analysis and systems analysis were considered virtually synonymous — most policy people were using systems analysis in some way. That approach came into disrepute in the late 60s and early 70s. In this presentation I want to touch on what happened with systems analysis, in case there are people out there who are skeptical about why somebody would even bother to talk about systems thinking again. I also want to give some information about where systems thinking has moved to, because it has entered a space that has a lot of commonalities with complexity thinking. I would also like to talk about the relationship between systems thinking and complexity science before going onto my own work, which is about *systemic intervention*.

When I talk about 'systemic intervention', I am making an assumption that I think all systems thinking and complexity approaches make: that everything in the universe is directly or indirectly connected with everything else. However, you can't have a God's eye view of that interconnectedness, so there are inevitable limits to understanding, and it is those limits that we call *boundaries*. So, systemic intervention is fundamentally about how to explore those boundaries, and how to take account of the inevitable lack of comprehensiveness and begin to deal with it. This will lead me onto talk about something that I've called *boundary critique*. And by this I mean being critical of boundaries, rethinking them, considering the different meanings they invoke and the values associated with those meanings.

The discussion of boundary critique will take me onto the need for theoretical and methodological pluralism, drawing upon mixed methods, and evolving methodology on an ongoing basis. Throughout this talk I will give you some practical examples, as I think

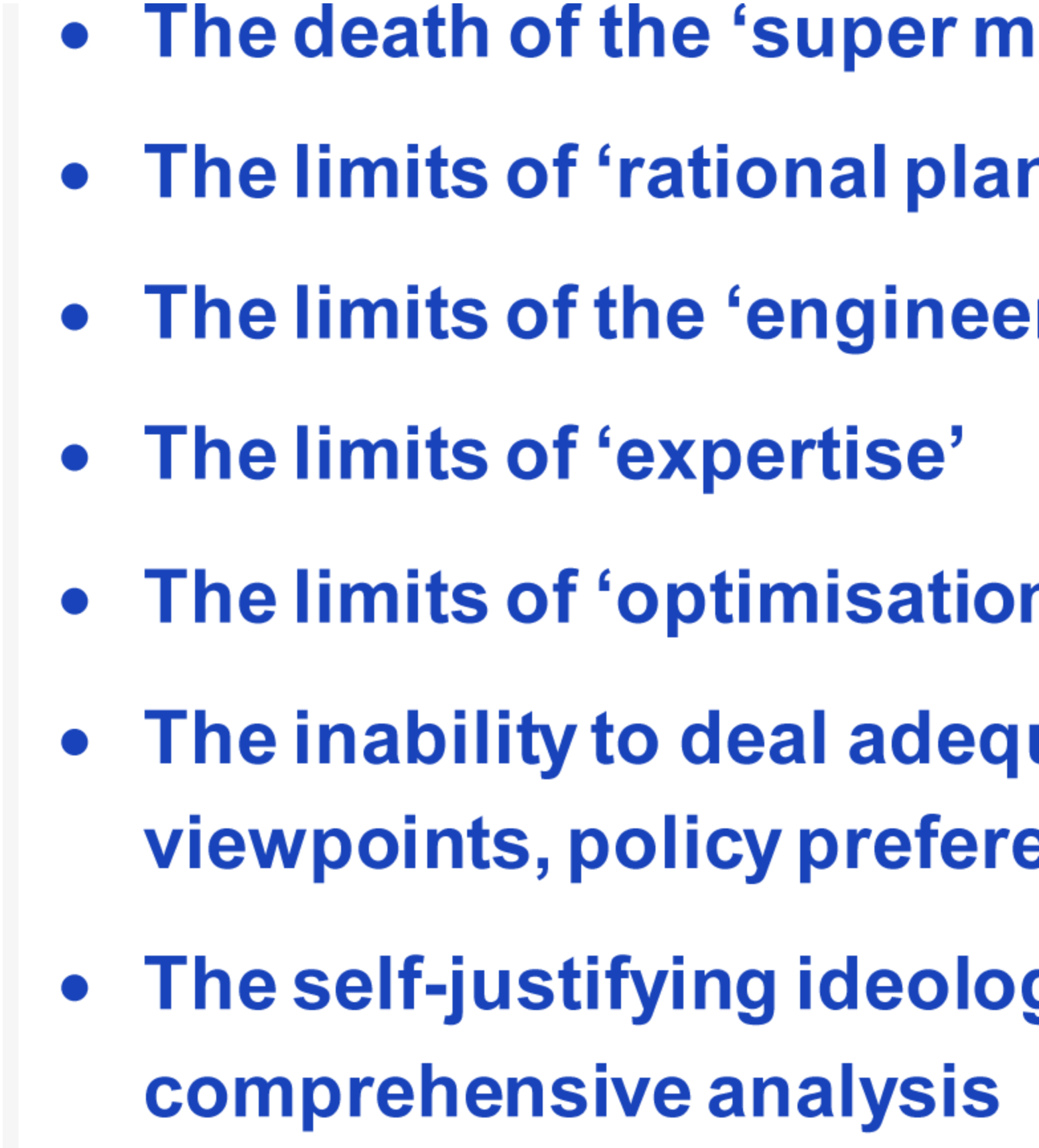

Fig. 1: Slide 1

The critique of systems analysis (‘60s and ‘70s)

it is quite important to ground these ideas in practice to give them deeper meaning.

The critique of systems analysis (1960s and 1970s) (slide 1)

Let us start with what happened to system analysis in the early days. People may be aware that there were lots of large scale modeling projects in the 1950s and 1960s. The ones that seemed to come into most disrepute were the ones where giant models were built, especially in California (the Californian experience seems to be the typical one that other authors have written about), where local government offices were recruiting consultants to build models of whole cities with no particular purpose in mind. The belief was that a policymaker could go to the modeler and say, "Well, can you now answer this question for me given all the wonderful data that you have?" Of course, by building models without purposes you end up with such huge complexity that the results are largely unreliable and meaningless. In the 1960s, millions of dollars were invested in giant models of this nature, with limited practical results. I call this phenomenon the *death of the super model*.

People also began to realize the limits of conventional *rational planning*. And the example that I like to give (it's not really an example from systems thinking actually — it's an example from operations research in the UK) is the planning of Stansted airport. Here, they spent a lot of money commissioning an analysis of the best option for building a new London airport. They evaluated a number of alternatives, taking account of environmental and social impacts, etc., and then said, "This is the best one." The politicians promptly replied, "Well, that's no good. It doesn't take into account our political realities, and we'll choose this one instead." This example is widely regarded in the OR community as illustrating the decline of rational planning. Actually to me it's an example of *irrational* planning. It's irrational because it did not take into account the perspectives (or the rationalities — plural) of those people who needed to take the decision. That doesn't mean that you just agree with political perspectives, regardless of the assumptions they are based upon, but it does mean that you have to work with them in order to be able to get something that's going to be useful.

Interestingly, these issues were not only encountered by systems analysts. There was also a major *systems engineering* movement that spread across the world in the 1950s and 1960s. With the term 'engineering', of course, come all the connotations of being able to command and control social systems, as if people with their own self-consciousness didn't actually sometimes say, "I want to resist those kinds of improvements." So, the engineering metaphor began to die away.

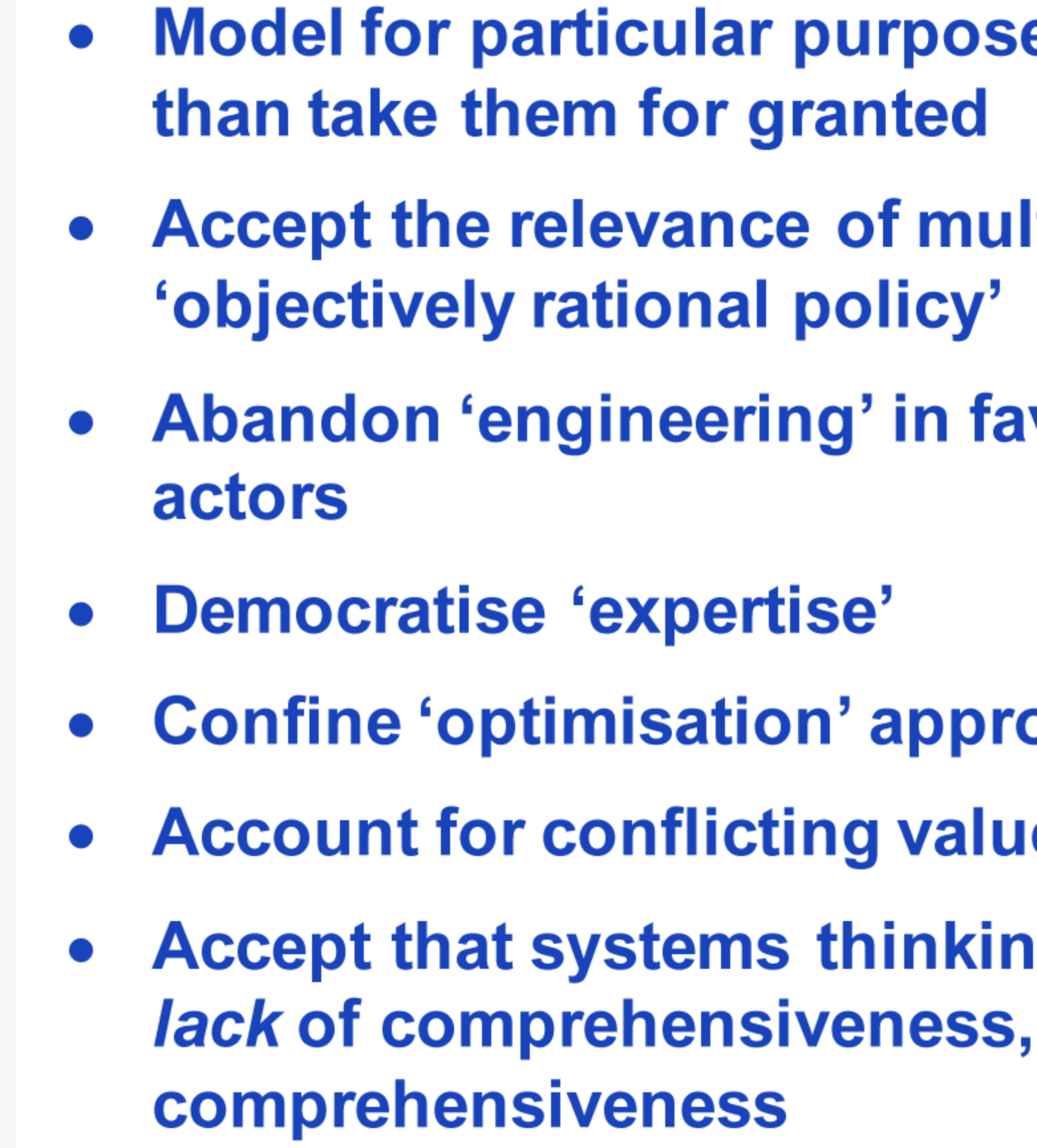

Fig. 2: Slide 2

More recent systems thinking principles

The notion of 'expertise' also came under scrutiny, i.e., the idea that modelers and scientists always know best. People began to realize that other kinds of expertise (e.g., the expertise of the people on the receiving end of some of these policies), were

actually important.

People also began to appreciate the limits of optimization approaches. It is simply the case that what is optimal from one perspective may, given a different value set and a different perspective, be completely unacceptable. So, simply talking about optimization as the only thing that we do is not enough.

With the inability to deal adequately with conflicting values, viewpoints, policy preferences, ideologies, power relations, etc., the limitations of some of the 'engineering', 'rational' and 'optimization' approaches began to show through. People began to realize that, if you simply start with the goal of one stakeholder and assume that this is unproblematic, then all kinds of side effects can emerge.

Finally, on Slide 1, I have said that, in the 1960s, the 'self-justifying ideology' of systems science was one of*comprehensive analysis*. What often happened is that if a model failed (i.e., if people were not satisfied with the results), the modelers simply said "we weren't comprehensive enough so we need more systems analysis." If that kind of reply is given often enough, people will eventually declare, "the Emperor has no clothes."

So that's what was happening in the 1960s and 1970s, with the backlash against systems analysis, and it really took systems thinking a good decade to recover its credibility. In that process of recovery, some quite dramatic shifts in systems thinking happened. I'll talk very generally about what those shifts involved. Of course you will always be able to find exceptions to these generalizations, and there are dimensions to the shift that I will not cover, but here I am only able to provide an overview.

More recent systems thinking principles (slide 2)

Instead of producing massive super models, modeling for particular purposes (rather than all purposes) became more usual. Much more focused modeling was undertaken that didn't necessarily pretend to be comprehensive, but actually thought about what is involved in making a model fit for purpose. Also, modelers*explored* those purposes instead of just taking them for granted. So, now people began to embed that modeling in a social process, as opposed to simply producing a mathematical model and thinking that it will produce the answers on its own.

Part of the new socially-embedded modeling process was accepting the relevance of multiple rationalities, instead of generating

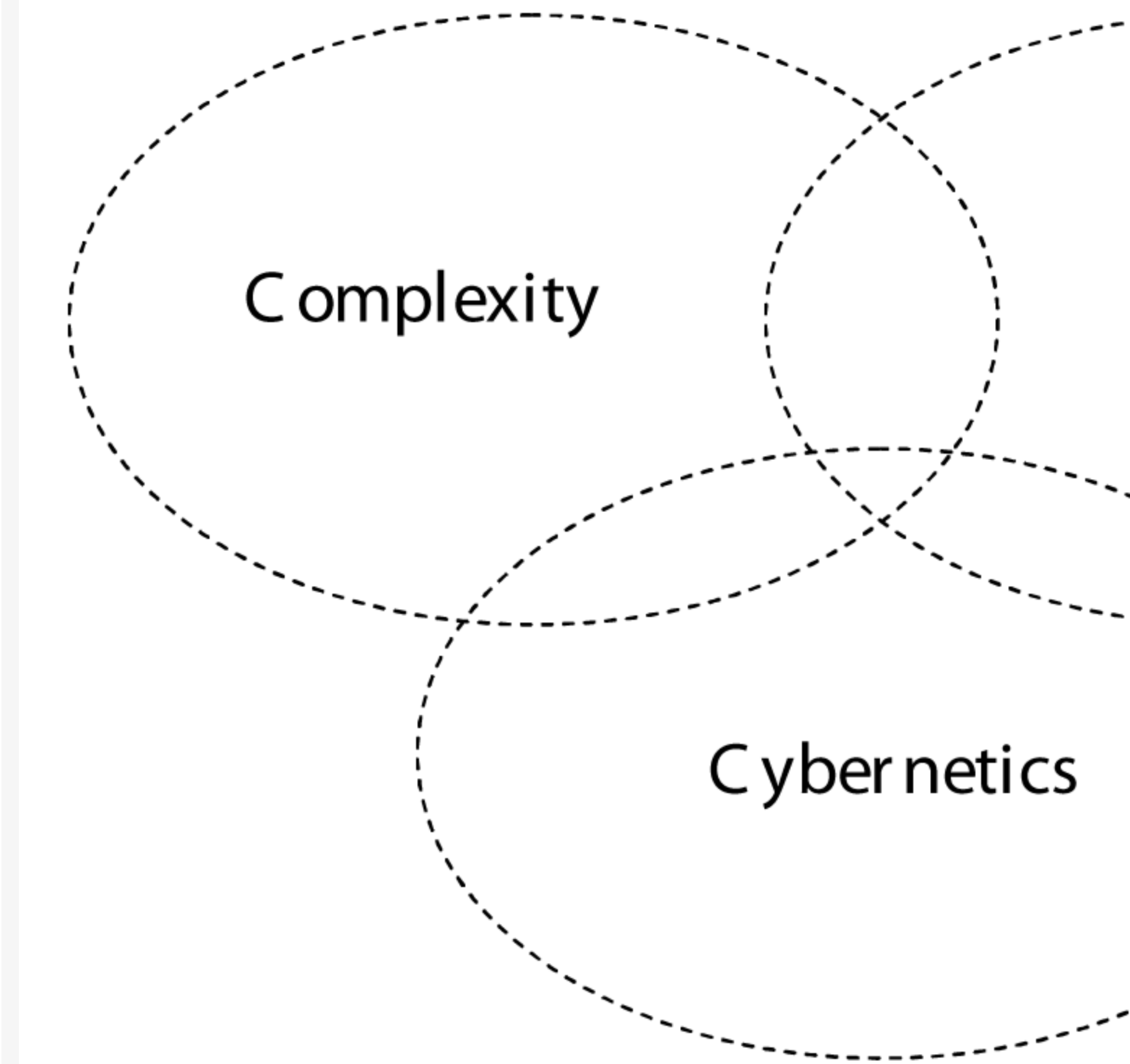

Fig. 3: Slide 3

Systems thinking and complexity science

a so-called objective rational policy. We began to realize of course that, if there are different perspectives out there, it's going to matter whether our modeling is meaningful or not to those different perspectives.
The engineering metaphor was largely abandoned in favor of engaging with self-conscious actors, although it is still around in a few places. For example, in the military domain, people still talk about systems engineering. It's also still prominent in China where there's an institute for systems engineering (which has over 600 researchers) that is as important as the institutes for physics, biology and chemistry. In Colombia, there are still systems engineering degrees, but what they teach is actually the whole breadth of systems thinking, so the term has changed its meaning.

The democratization of expertise has also taken place. Instead of assuming that the necessary expertise is simply scientific, modeling or policy expertise, many other possible types of expertise are recognized, including perspectives from people in the community. From my own point of view, it is really important to preserve the notion of expertise because, although there have

been some people arguing that we should just get rid of the term, it's quite dangerous to pretend that the systems thinker, or the intervener, is 'just another participant'. They actually play quite a pivotal role in constructing events, and by labeling it as a particular kind of expertise, you can make them accountable. If you lose the notion of expertise altogether, there is a risk that you lose accountability for the exercise of power.

The value of optimization approaches has not been entirely undermined, but there is a growing acceptance that such approaches have limited spheres of application. I like something that somebody said yesterday about *islands of tractability*, as it is an idea that has really come into favor. The idea is that there are, of course, valid applications for optimization techniques. You want the trains to run on time. You want to be able to get to a conference like this on time. Of course we need optimization techniques, but they have *limited domains of application*. We also need approaches that account for conflicting values, viewpoints, policy preferences, etc.

Ultimately, the contemporary systems view urges us to accept that *systems thinking is about dealing with the inevitable lack of comprehensiveness, and is not the means to achieve comprehensiveness*. This is a really crucial shift in how systems thinking has developed.

Systems thinking and complexity science (slide 3)

In terms of the relationship between complexity and systems (why I'm here basically, in terms of learning from complexity people and hopefully the learning being two-way), I see systems thinking as a discourse that has a community of people who are engaged within it, with fuzzy boundaries at the edges. I think that complexity is quite similar in that respect. There's a community of complexity researchers, and both communities overlap

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Fig. 4: Slide 4

Multiple paradigms of systems and complexity