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The Systemic Intervention Approach

Gerald Midgley[a,b,c,d,e,@]
a: Centre for Systems Studies, University of Hull, UK
b: Birmingham Leadership Institute, University of Birmingham, UK
c: Department of Informatics, Linnaeus University, Sweden
d: School of Innovation, Design and Engineering, Mälardalen University, Sweden
e: Schumacher Institute, Bristol, UK

@: G.R.Midgley@hull.ac.uk

Introduction

Many of the environmental, social and organizational issues that we face in contemporary society exhibit significant complexities: numerous interacting variables that need to be accounted for, and multiple agencies and groups who bring different perspectives and concerns to bear [1,2]. In response, it has become relatively common for people across the public, private, voluntary, and community sectors to call for a systems approach. The desire is for a "bigger picture" understanding, both of complex, non-linear interactions and the dynamics of multiple stakeholder relationships and perspectives. Those calling for a systems approach hope that glimpsing the bigger picture will help them, not only to take appropriate action, but also to anticipate possible negative side-effects of intervention. The aim of a systems approach is to design new ways forward that pay greater attention to the systemic complexities of the context than more narrowly focused social policy and management science methodologies [3–5].

To address the call for a systems approach, I offer a 'systemic intervention' methodology [6]. It explores the complexity of the situation and the different purposes that stakeholders bring into it. This exploration includes a consideration of different possible boundaries and values (what matters in relation to the purposes being pursued in a particular context of action) that are relevant to understanding the situation and designing systemic improvements, and it looks out for processes of conflict and marginalization that might need to be addressed. It also offers a theory and practice of creatively mixing methods from a diverse range of methodological sources in response to the initial exploration. This creative mixing of methods yields a much more flexible and responsive approach than might be possible with just a few tools from a single source.

Like all the other systems methodologies in this *Handbook*, the first emergence of systemic intervention [6–8] had a historical context. This chapter therefore starts with a brief explanation of the most relevant challenges and debates that I was responding to when I first proposed it. Then I explain how systemic intervention is grounded in a new approach to systems philosophy, which informs its methodology and practice. This methodology (particularly the exploration of boundary judgements and the creative mixing of methods) is the main focus of the chapter. Each aspect of the philosophy, theory, and methodology is illustrated with practical examples from my own interventions, undertaken with collaborators.

Historical Context: The Third Wave of Systems Thinking

There have been three "waves" (or paradigms) of systems thinking since the 1950s [6,9,10], and there is currently discussion of whether a fourth wave is beginning to form [11,12]. The waves will not be discussed here, as they are described in detail in the literature just referenced (and also see the work of Jackson [13], who provides a historical analysis without using the wave metaphor). Suffice it to say that the third wave, in which systemic intervention can be situated, was at least in part a response to two significant criticisms of previous systems methodologies and the practitioners advocating them, for naiveté about power relations and engaging in a paradigm war between first and second wave systems thinkers (for other criticisms, see [14–20]). These two criticisms are explained in more detail below.

First, the previous waves of systems thinking were critiqued for being relatively naïve about power relations [13,21–23]. The first wave methodologies [e.g., 24–31] tended to involve "expert" systems analysts operating in consultancy mode, and they often took client agendas as given instead of sweeping in other stakeholder perspectives and evolving project briefs [13,15,16,32–34]. They were also criticized for viewing human beings as objects that could be manipulated as parts of larger systems, instead of individuals with their own goals, which may or may not harmonize with wider organizational priorities [17,35]. In their desire for objectivity, the first wave methodologists failed to see the value of stakeholder participation, which enables collective self-empowerment, fueled by learning about purposes and perspectives across stakeholder boundaries. This learning is essential to finding mutually acceptable solutions to the complex issues being addressed [3,17,32,33,36,37]. Finally, the emphasis of practitioners on the desirability of massive computer models [15] sometimes tipped over into unfalsifiable faith, so when projects failed to live up to expectations, the answer was invariably a bigger and more complex model rather than rethinking the whole approach [16]. This consolidated the power of the first wave "expert" at the expense of finding new solutions that would work more effectively for both clients and communities.

In contrast, the second wave methodologies [17,38–40] were much more strongly participative, and placed an emphasis on enhanced mutual understanding among stakeholders rather than objective analysis. Therefore, they corrected for some of the weaknesses of the first wave approaches, and indeed some previously existing methodologies were thoroughly rethought in the second wave of systems thinking to make them more participative [41,42]. However, there were still issues with power relations. It was pointed out that coercion and hierarchical relationships can obstruct the open communication that is fundamental to a participative approach [13,21–23,43,44]. Also, systemic processes of marginalization [6,45–47], where some stakeholders and their concerns are derogated by others who pursue relatively narrow objectives, likewise damage open communication, requiring adjustments to modes of participation: e.g., provision of separate, confidential space for marginalized stakeholders to talk [6,48–51]; building between-group empathy [52]; challenging stereotypes [53]; enabling the transcendence of narrowly defined purposes and values [54]; and establishing rituals of social inclusion [54].

A further issue discussed in relation to second wave methodologies followed from the observation by Thomas and Lockett [55] and others that unjust power relationships are built into the structure and/or

culture of society: it was pointed out that the tendency of most practitioners to do projects with single organizations often means that these wider issues are avoided [56]; or worse, the extent of organizational participation can give people the *impression* of radical change, but in reality all the "solutions" developed through that participation tackle locally relevant issues while taking wider societal power relationships as given [13,21–23,55,57,58].

All the above criticisms concern naiveté about power relations, but (as mentioned earlier) there was also a second criticism of the previous waves of systems thinking: a highly divisive paradigm war had opened up between first and second wave systems thinkers [18,59–61]. First wave thinkers were said to prefer quantitative modeling, sought objectivity, mostly operated in an expert mode, and viewed systems as real-world phenomena, while their second wave opponents favored qualitative modeling, sought intersubjective understanding, mostly operated in a participative mode, and viewed systems as conceptual: i.e., in the mind of the observer, with the systems idea used to *interpret* phenomena (or model potential actions for change [17]), rather than those phenomena actually *being* systems [13]. Dando and Bennett [59] observed that, at the time they were writing, the paradigm war had become so divisive that it threatened to destroy our research community.

In response to these two critiques (focused on power relations and conflict between competing paradigms), the third wave of systems thinking began to coalesce under the banner of "critical systems thinking" (CST) [62,63].

First, Ulrich [64,65] addressed the issue of power relations obstructing free and fair dialogue by offering a CST approach that he called "critical systems heuristics". This was designed to support ordinary citizens as well as planners in examining and challenging the boundary judgements implicit in change; i.e., what is included in or excluded from consideration, and who gets to make decisions on this. He argued that, if planners refuse to listen to stakeholders and citizens, the latter have a right to advance a "polemic" to embarrass those planners into meaningful engagement.

Next, in a separate research program from Ulrich's, and in response to the need to end the paradigm war, Jackson and Keys [18] called for recognition that the two paradigms are actually useful for *different purposes*, so should be viewed as complementary rather than competing. Broadly speaking, first wave approaches were said to be more useful when there is stakeholder agreement on the purposes of a project, and quantitative analysis can therefore aid the design of objectively-best or optimal solutions. However, when there is disagreement between stakeholders but open communication is still possible, or the situation is messy and unclear, second wave approaches focused on building better mutual understanding come into their own [13,18,66,67].

The call was for *methodological pluralism* (sometimes also called "multimethodology"[68]), and a rapidly-growing group of researchers contributed to defining what this meant [13,43,60,61,66–84]. Essentially, the focus was drawing upon a wide range of methodologies to address a correspondingly wide range of purposes in interventions, instead of favoring just one relatively narrow methodology and pretending it can address every context we might encounter in systems practice.

Importantly, both the researchers interested in exploring boundary judgements [64] and those aligning

different methodologies with different contexts of application [13] drew upon the same body of literature on the potential for an expanded form of dialogue in the public sphere to counter the negative effects of power relations built into the structure and culture of our politics, economies and wider societies [85–87]. This body of literature is commonly called "critical theory", and it was used in conjunction with the systems literature, which is why the label "critical systems thinking" was meaningful for both strands of research.

Nevertheless, these two strands were not fully unified during the late 1980s and 1990s, and tensions between them emerged. Flood and Jackson [67] portrayed Ulrich's [64] critical systems heuristics as just another systems methodology with its own strengths and weaknesses, rather than a broader approach that embraced political philosophy and social theory, as Ulrich intended. Flood and Jackson [67] sought to subsume critical systems heuristics within a six-box framework aligning different methodologies with their "most appropriate" contexts of application. It was said to be useful when relatively simple and straightforward cases of coercion are encountered. Ulrich [88] strongly resisted this, saying that exploring boundaries is necessary in any situation where there might be initially-hidden complexities or contested objectives: we can't know whether these things exist without some preliminary testing of boundary judgments [6,88,89,90]. Later, he criticized Flood and Jackson [67] for reducing the critical-systemic idea to being critical about the strengths and weaknesses of different systems methodologies to inform choice between them, instead of appreciating its more general significance for subjecting problematic, taken-for-granted boundary judgments (made by stakeholders and/or the practitioner) to critique [91]. Jackson [92] then replied that different systems methodologies offer different understandings of what it means to be critical about system boundaries, so we can take advantage of them all if we prioritize methodological pluralism.

While the *practical* context of launching systemic intervention was the pressing need to address the burgeoning complexity of many ecological, social and organizational issues (including power relationships and the limitations of existing approaches), it was the above debate between advocates of the two strands of critical systems thinking that formed the *academic* context for the emerging systemic intervention approach. I wanted to unite the two strands, in the belief that *both are right*, but limited on their own. As Ulrich [64] claims, exploring boundaries is indeed of generic relevance when approaching potentially complex problem situations, but this alone is insufficient because it doesn't help stakeholders define actions to be taken: once some provisional boundaries are chosen, methods drawn from other methodologies (or designed from scratch) can be brought on stream to support stakeholders in thinking systemically about possible solutions, or ways forward for action—and the learning that is facilitated through the use of these methods can actually enable a further rethinking of the boundaries. Theoretically, cycling between the rethinking of boundaries and methods could go on indefinitely, but in practice a systemic intervention is undertaken to move towards some kind of improvement [6], so the need for action inevitably becomes an *enabling constraint*: i.e., a driver for the setting of boundaries and design of methods that can be justified as "good enough", with the practitioner and others being open to dialogue on what "good enough" means).

After I wrote my first paper on what a systemic intervention approach that could unite the two strands of critical systems thinking might look like [7], I realized that it is possible to go much further: a new approach to systems philosophy might be possible, which could challenge some of the problematic

assumptions that have been ingrained in Western culture and scholarship for hundreds of years—and which even some systems methodologists had unwittingly inherited [6,12,93]. Further details of three such major assumptions (reductionism, mechanism and subject/object dualism) can be found in the literature just referenced, but here I am going to focus only on subject/object dualism, which is arguably the assumption that is most frequently criticized by systems thinkers (see, for instance, Bateson [94] for one of the best known critiques). Subject/object dualism means seeing the object (whatever is in the world) and the subject (the person who creates an understanding of the object in their mind) as unconnected, or independent from one another, so it appears to be a reasonable proposition to focus on one (either the external world or the individual mind) to the exclusion of the other.

As I worked on the new systems philosophy, I expanded on what is needed for an approach that can support both explorations of boundaries and methodological pluralism, and I reflected on a series of my own practical interventions that embodied this way of thinking. It became apparent that it would be possible to write a wide-ranging book. This was called *Systemic Intervention*, and it was published in the year 2000 [6]. Below, the systems philosophy is summarized first, followed by the two main aspects of the methodology (boundary critique and methodological pluralism). Practical examples of application will be provided too, but what will *not* be discussed here are the multiple methodologies that I have adapted methods from during my systemic interventions. Many of these are covered in other chapters in this *Handbook*, and also see Midgley [95] for reprints of a wider set of classic, influential methodological papers.

Toward a New Systems Philosophy

As discussed earlier, Midgley's [6] systemic intervention is founded upon a new approach to systems philosophy, challenging subject/object dualism. The latter involves the conceptual splitting of the "subject", who observes things and is the holder of knowledge about them, from the "object", which is observed and known. If, following this split, the subject is hidden from view, we end up with a false impression of perfect objectivity and denial of the relevance of subjectivity, as if we can have knowledge without a knowing subject. Alternatively, if the object is hidden, we succumb to the illusion of solipsism: denial of the existence of anything outside an individual consciousness.

The ideal of objectivity has long been central to the pursuit of science, and Popper [96] famously talks about how any piece of scientific knowledge involves a truth claim, based on an "independent observation" that is tested and agreed upon by a community of scientists. Philosophers of science, such as Popper [96,97], make it clear that independent observation doesn't actually mean observation without an observer: it means that any observer undertaking the same observation under the same conditions would arrive at the same conclusions about the truth claim. In other words, any possible biases brought in by the subject have been eliminated.

There are two problems with this from a systems perspective. First, many scientists (let alone non-specialist readers outside scientific communities) don't actually study the philosophy of science and are unaware of the careful caveats built into the above understanding of what a truth claim involves. Therefore, there is insufficient scrutiny of the role of subjective perception and inter-subjective

interpretation, as objectivity is largely taken for granted (unless an obvious methodological mistake has been made).

The second problem with this understanding of science is more important: it assumes that subjectivity and non-universal inter-subjectivity (especially of the researcher) should be *eliminated*, instead of being understood as *a critically important source of information* [98-102]. Science, as traditionally practiced, focuses on truth claims about the world, but marginalizes or excludes other vital foci, including inter-subjective claims of rightness (socially shared value judgements about appropriateness, including what it is appropriate to research) and understandings of individual subjective perspectives (including the researcher's personal values) [3,64,71,85,87,101–104].

Also, as mentioned above, authors hiding the object make the same assumption of subject/object dualism: they become so concerned with exploring subjectivity that they deny the possibility of speaking about anything beyond the contents of consciousness, so all claims to objectivity lose their legitimacy (see, for example, [105]). From a systems perspective seeking to transcend subject/object dualism, this is equally problematic [106–109].

Midgley's [6] argument for a new philosophical approach to this issue can be summarized as follows. A conventional approach to epistemology (the study of the nature of knowledge) asks, if there is such a thing as knowledge, what gives rise to it? There are many possibilities: an individual consciousness, an embodied mind, an individual linked into a linguistic community, an intersubjective construction of a social group, etc. Actually, there are as many possibilities as there are theories of epistemology.

Now, anything that can be seen as giving rise to knowledge can be called a "knowledge generating system". The trouble is, if the task of epistemology is to identify a general theory that can specify the nature of knowledge generating systems, it is very easy to slip into subject/object dualism. Somehow, knowledge generating systems come to be seen as fundamentally distinct from the knowledge of the world they give rise to. This is illustrated in Figure 1.

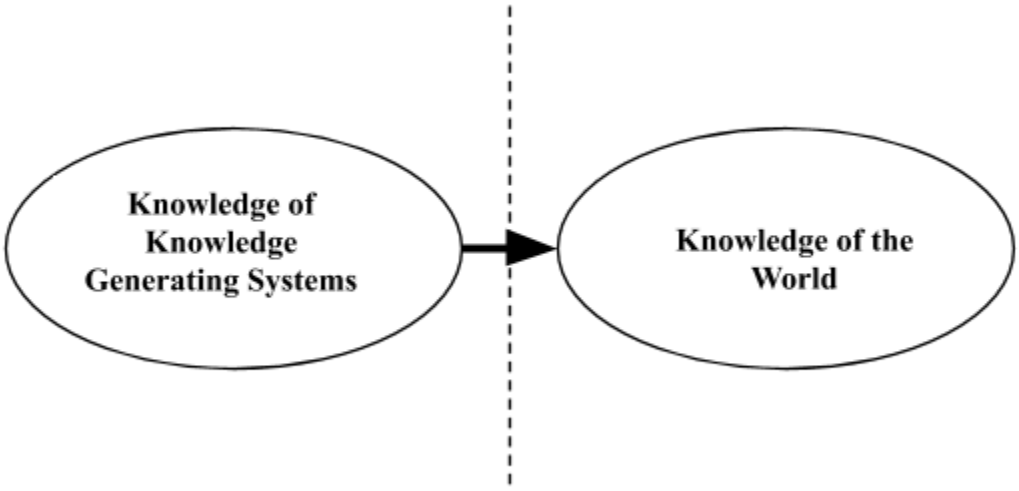

Figure 1: Conventional approach to epistemology (adapted from [110], p.5).

However, there is an alternative approach to epistemology. A key insight is that what we actually know about any situation has limits, and it is these limits that we call boundaries. So, for Churchman [3], Ulrich [64], Midgley [6] and Cilliers [111], amongst others, all knowledge is dependent on boundary judgments, whether these boundary judgments are implicit or explicit. If we recognize this, then suddenly both knowledge generating systems and the world itself come to be defined in *exactly the same manner*—through the process of making boundary judgments [6]. This is represented in Figure 2. Knowledge about knowledge generating systems and the rest of the world has the same character: there is no dualism between the subject (knowledge generating system) and object (world).

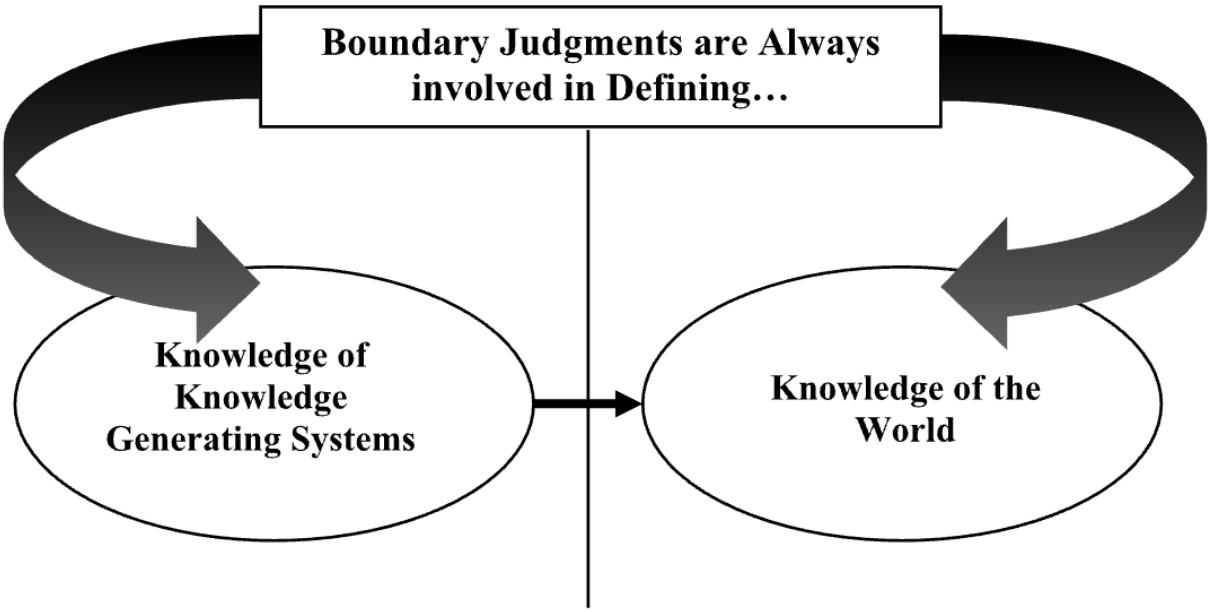

Figure 2: Systemic Approach to Epistemology (adapted from [104], page 6).

Of course, there is still a *kind* of dualism in here, but it's not the pernicious subject/object dualism that underpins mainstream scientific and other research practices that focus on only one side of the subject/object pair while making the other side invisible. Rather, it's a duality between the *process* of making boundary judgements and the *content* of any analysis, whether it's an analysis of what's in the world or an analysis of knowledge generating systems giving rise to knowledge about the world. This actually means that it is possible to accept any number of theories about either knowledge generating systems or the wider world, depending on our purposes. Each theory will be based upon a different boundary judgment [6,110].

Of necessity, there is a great deal of detail missing from this summary of the new systems philosophy. For instance, it is important to acknowledge that boundary judgments about the world cannot exist independently from knowledge generating systems—it's just that defining the nature of the latter requires a boundary judgment and should not be taken for granted. I therefore recommend consulting Midgley [6,110] for more information.

Appreciating the duality between the process and content of an analysis, and realizing that the identity and knowledge of the subject are intimately tied to how the object is seen [98–100], makes it abundantly clear that the practitioner needs to critically reflect on his or her own self-understanding, knowledge, identity and relationships with others in order to reveal assumptions flowing into the way the wider world and the practitioner's part in it are perceived [64,65,80,112–119]. Also, appreciating how others might perceive one's own identity can really matter, as trust cannot always be taken for granted [120].

Below, I explain the methodological implications of this philosophy for systemic intervention, starting with an explanation of the meaning of the term "systemic intervention" itself.

Systemic Intervention Methodology

The term "systemic intervention" is made up of two words, and I will start by defining "intervention". I see it as *purposeful action by an agent to create change*. I accept that this definition raises questions about purpose and agency, but these are addressed elsewhere [6,101,102]. My emphasis on intervention contrasts with the usual focus of science on observation. However, unlike some authors who champion intervention [e.g., 121], I do not regard it as incompatible with scientific observation: methods for observation can be harnessed *into the service* of intervention.

Building on the above definition, and drawing upon the philosophy discussed in the previous section, I characterize *systemic* intervention as purposeful action by an agent to create change *in relation to reflection upon boundaries.*

One common assumption made by many systems thinkers is that everything is either directly or indirectly connected with everything else. However, human beings cannot have a "God's-eye view" of this interconnectedness [39]. What we know about any situation has limits, and (as discussed earlier) it is these limits that we call boundaries. Comprehensive analysis is therefore impossible. Nevertheless, by acknowledging that this is the case, and by explicitly exploring different possible boundaries for analysis, we can paradoxically achieve greater comprehensiveness than if we take any single boundary for granted [122,123]. I call this process of exploration *boundary critique* [50]. For me, this is the crux of what it means to be systemic.

Boundary Critique

The term "boundary critique" was first coined by Ulrich [124] to refer to his own methodological practice, but here (following Midgley et al. [50]) I am using it more broadly as a label for the concern with boundaries that is present in the writings of several authors, starting with Churchman [3].

Churchman's basic insight is that boundary judgements and value judgements are intimately linked. Values direct the drawing of the boundaries that determine who and what is going to be included in an intervention, so the most ethical systemic practice is one that involves pushing out the boundaries as far as

possible in order that a wide set of stakeholder values and concerns can be accounted for (but without compromising comprehension through over inclusion).

However, Ulrich [64] argues that, in practice, it is often difficult to push out the boundaries in this way: other constraints can intrude. Ulrich therefore stresses that boundary critique should involve the justification of choices among boundaries, and should be a rational process. The widest possible boundary is not necessarily the most rational, given practical considerations. For Ulrich (following Habermas [87]), rationality is inherently dialogical: all rational arguments are expressed in language, and language is primarily a tool for communication, so a boundary judgment is only truly rational if it has been agreed in dialogue with all those involved in and affected by an intervention. Stakeholder participation (of those involved in or affected by decision making) is therefore crucial to boundary critique (also see [124]).

Marginalization

In my own research on stakeholder participation and boundary critique, I have been particularly interested in what happens when two or more groups of people make different value/boundary judgments and then find themselves in entrenched conflict. As an aid to understanding and intervening in such situations, I offer several generic models of conflict, marginalization and stigmatization processes [6,125–127] that explain the persistence of difficult relationships between stakeholders [128–130]. Here, I will focus only on marginalization. Stakeholders and issues can both be marginalized, and this marginalization can even become institutionalized.

The most commonly used model of marginalization can be found in Figure 3. I argue that, in conflict situations, if one group makes a narrow boundary judgment and another makes a wider one, there will be a *marginal* area between the two boundaries. This marginal area will contain elements that are excluded by the group making the narrow boundary judgment, but are included in the wider thinking of the second group. We can call the two boundaries the "primary" and "secondary" boundaries (the primary boundary being the narrower one).

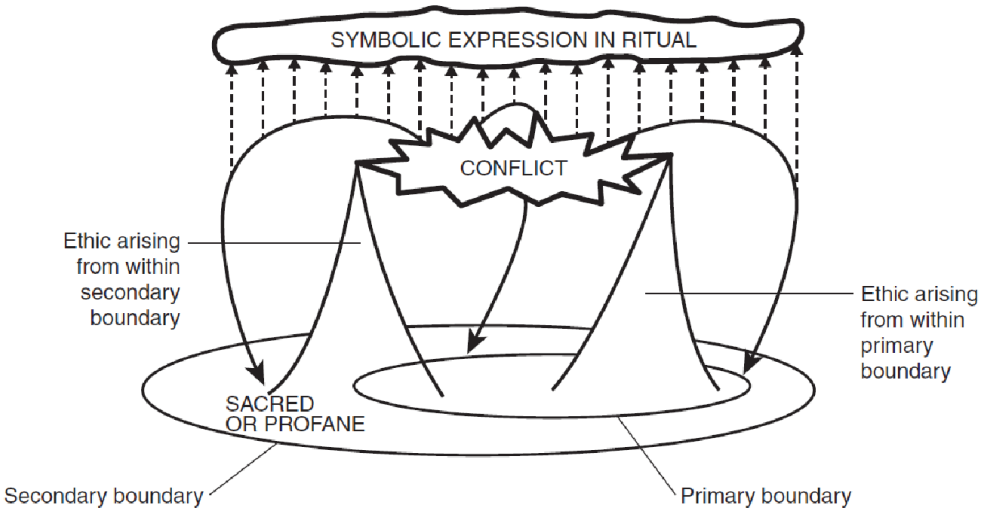

Figure 3: Marginalization Process (from [131], p.158).

In Figure 3, the primary and secondary boundaries both have a set of ethics (or values in purposeful action) associated with them. Between the two boundaries is the marginal area. Within this are people and/or issues that are of concern to those operating with the secondary boundary, but are excluded from the concerns of those using the primary boundary. The two ethics come into conflict, and whatever is in the margins becomes the focus of this conflict.

The conflict is then stabilized by the imposition of either a "sacred" or "profane" status on the marginal people or issues. These terms are not meant in a religious sense, but indicate the valued or devalued status of marginalized elements. Following Douglas [132], I use them in preference to more "neutral" language to reflect the strength of feeling that accompanies the derogation or exaltation of other people on the basis of their status, roles, interests, identities, or beliefs.

In a conflict situation, there is rarely a consensus about whether marginalized people or issues are sacred or profane, but by institutionalizing value judgements in social rituals, language and imagery, the conflict comes to be stabilized with one set of values dominating. So, if the profane status of marginal elements is institutionalized, then the primary boundary is reinforced because people can quite justifiably ignore or derogate whatever is in the margins. But if the sacredness of marginalized people or issues is institutionalized, then this challenges the narrow boundary judgment by encouraging the exaltation of whatever is in the margins, and this reinforces the wider secondary boundary.

These kinds of processes operate at every level in society, from small groups to international relations. Many different stakeholders and issues can be marginalized for all sorts of reasons, and when they are made profane, the effects can be quite devastating. Some forms of marginalization are relatively easy to overcome because they have their roots in quite localized histories of conflict, but some stem from conflicts that are structured into society as a whole, and these are the ones that are the most difficult to change [6]. It is vital to take processes of marginalization into account as part of boundary critique and systemic intervention, as discussed in the practical example below.

Boundary Critique in Action

A couple of years ago, my colleagues and I supported waste reduction in a large food production company in the Niger Delta region of Nigeria [133], drawing upon methods from second wave systems methodologies [134] and Lean [135]. Lean methods involve mapping value chains to identify waste that can be eliminated from industrial processes and supply chains [136,137]. One of my colleagues (Daniel Ufua) did the work on the ground in Nigeria, and another colleague (Thanos Papadopoulos) and I advised from the UK. One of the early questions we addressed was how boundary critique might make a difference, compared with a more usual approach to industrial waste reduction. In thinking about who the stakeholders might be, we widened the boundaries beyond those usually engaged in Lean projects, and we reached out to the local host community living in the surrounding area.

The community leaders we talked with raised a serious issue. They said that the company was dumping animal effluent, including carcasses, near residential areas, causing a persistent odor and significant public health risk. We asked the senior management about this, as the issue hadn't already been raised by anyone in the company. The management agreed that it was indeed a serious problem, but they were at a loss to know how to address it: the dumping ground had already been moved further away from people's

houses, yet residents were still complaining, and the Environmental Health Inspectorate had been informed. This meant that the company could be subject to escalating financial penalties, and the issue was threatening both their growth strategy and their relationship with their host community.

The community leaders we spoke with were espousing public health values on behalf of their fellow residents, but they also had an interest in the success of the company, as it employed many local people. In contrast, the food production company, which was primarily concerned with values of efficiency and profitability, initially focused only on their immediate premises—putting what was happening with the local community outside their boundary of concern (at least for our project). In terms of Figure 3, the company was operating with a narrow primary boundary, and the community was assuming a wider secondary boundary, putting both the effluent dumping and those complaining about it in a marginal position. The effluent was clearly viewed as profane by everyone, and the dumping activity could be interpreted as a kind of ritual—functional for the company, but also symbolic of the value conflict being played out, with the company's interests dominating. In addition, we saw a risk that, if the company continued as they were, the management could start to view the local community leaders as profane too (i.e., difficult or dangerous stakeholders who were not willing to see things from the company's perspective).

However, the community was not powerless in this situation: the marginalization was considerably mitigated by the involvement of the Environmental Health Inspectorate, which had given the company a financial incentive to address the problem. This can be seen as an assertion of the sacred status of the community's public health concern, and the imposition of escalating fines is a ritual that reinforces the importance of the secondary boundary around the whole community along with the sacred status of those public health values.

We judged that the barrier to progress had not been denial of the issue by the company management (which might have prevented further dialogue), but simply uncertainty about what more could be done to improve the situation. In making the waste dumping issue a significant focus of our intervention, we invited both representatives of the host community and the company to engage in participatory workshops using systems thinking and Lean methods to generate innovative solutions.

The final way forward to tackle the waste dumping was a win-win for everyone concerned. The company was experiencing a very unreliable electricity supply, and every time there was a long outage, it would add to the waste management problem: sometimes whole batches of eggs and chicks in incubators would die. One of the participants in our study (an interviewee in a government department) suggested that the waste could be used to generate biogas, which in turn could drive a generator. A feasibility study showed that actually there was *not enough* waste for this: the production of chickens would have to double to make the plan work. Following some market research to test whether they could sell enough produce if they ramped up production, investment was approved by the senior management of the company, resulting in more work for the local population, a solution to the waste dumping issue, a more reliable electricity supply, efficiencies and greater profitability for the company, and better relationships between the company, local community and Environmental Health Inspectorate.

This is a classic example of how widening the boundaries of who was involved in defining "the problem"

brought attention to a marginalized issue with major impacts. If not for the boundary critique, we were sure that the issue would not have surfaced in our project, despite the pressure being applied by the Environmental Health Inspectorate, as (prior to the community involvement) the managers were only thinking about waste reduction within the confines of their organizational boundaries. For more details of the case, and other examples of systemic intervention with this company, see Ufua et al [133]. Also see [138] for a new critical-systemic approach to stakeholder analysis, inspired by boundary critique and other theories.

Methodological Pluralism

In addition to boundary critique, I also advocate two forms of methodological pluralism. The first is learning from other methodologies to inform one's own. This way, each agent has a *continually developing* methodology. We no longer have to accept a situation where people build a static methodology like a castle and then defend it against others who want to breach the castle walls. Rather, if people begin to see methodology as dynamic and evolving, they can learn from others on an ongoing basis [6,139].

This is particularly useful and important in contexts where a team is formed from members with initially-different methodological ideas, who come together to undertake a project of common interest: Velez-Castiblanco and colleagues [140,141] researched just such a team, and tracked the members in a complex "dance" as they negotiated how to conceive of and act within their project: sometimes there was a strong convergence between the methodological understandings of the team members, especially in action-orientated meetings when decisions on what to do had to be taken; and sometimes there was divergence, particularly when members were operating on their own between meetings [140]. Mutual appreciation and methodological learning from other team members is obviously necessary for coordination, but even a lone practitioner can learn from others if they consciously expose themselves to different perspectives and think about what they might usefully gain from them.

If learning from other people's methodologies is the first form of methodological pluralism, the second involves *drawing upon and mixing methods* from other methodologies [6,13,60,64,68,142-144]. The wider the range of methods available, the more flexible and responsive our systems practice can be. No methodology or method, whether it comes from the systems thinking tradition or elsewhere, can do absolutely everything people might want. Therefore, being able to draw upon multiple methods from different paradigmatic sources can enhance the systems thinking resources we have available for intervention.

It is important to note that, when mixing methods, the aim is to find appropriate ways to address a *set* of intervention purposes. However, this doesn't usually mean one-to-one alignments between purposes and methods, as if the intervention can be disaggregated into completely separate parts, each of which is tackled independently of the others. Rather, *synergies* are looked for [142,145]. Most commonly, these take one of two forms:

The first is synergies across methods arranged in a sequence. For instance, in tackling the issue of how international organized crime interfaces with local gang violence, Sydelko and colleagues [2,146,147] first designed a new method called "systemic perspective mapping" to help the various agency

representatives gain a better appreciation of their different partial understandings of the complexity of the crime problem. Then they supported the design of a collaborative interagency organization using the viable system model [148]. If they had stopped at just gaining a better understanding of people's partial perspectives on the complexity, it is likely that the agency representatives would have been left feeling that they were no better prepared to collaborate on action. Conversely, if they had gone straight into the design of an interagency organization, it is likely that there would have been conflicts of perspective, with each agency representative thinking they were right and others were wrong, making collaboration more difficult than it needed to be—the systemic perspective mapping prepared the ground by supporting learning, so they could better appreciate the "bigger picture" of organized crime as well as the limitations of their own perspectives on it, stemming from their partial, situated roles.

The second form of synergy is when aspects of two or more methodologies or methods are fully integrated into a single new approach. An example from Midgley [6] is the integration of twelve questions from Ulrich's [64,145] critical systems heuristics (used to support people in challenging the boundaries of design proposals) with Ackoff et al's [149] interactive planning method. The latter supports people in designing ambitious solutions to social and/or industrial problems, and it ensures that these solutions are checked for technological feasibility, viability, and adaptability to future changes. Each contributory element of this approach strengthens the other in a new whole: Ulrich's questions make interactive planning more critical about boundary judgments and governance requirements than otherwise might be the case, while interactive planning provides a design framework that channels the use of those twelve questions into the co-creation by stakeholders of a new service, policy, or social change. This approach has been applied in a number of systemic interventions [6,48,50,145,150], including the design of new services for homeless young people living on the streets [52], discussed below.

Of course, it is also possible to develop entirely new approaches and methods from scratch, if and when no previous methods seem to meet the needs of the project [2,52]. Because of the search for synergies between methods to address multiple research purposes and the complexities of the context, and because developing new methods is also possible, this whole approach to synergistic development has been called the *creative design of methods* [6,145,151], which is illustrated with an example below.

The Creative Design of Methods in Action

In the late 1990s, I worked with Alan Boyd and Mandy Brown on a project to facilitate the design of new services for young people (aged under sixteen) living on the streets [6,52,152]. We recognized, and all the relevant stakeholders concurred, that it was crucial for young people to be core participants in the research. Elsewhere [52], I have written about how the marginalization of young people was countered, so they could indeed play a central role in the service design process. Here though, I want to focus on methodological pluralism. The project used a number of different interlinked methods and techniques:

- Individual interviews with young people, foster caretakers, and retailers;
- The use of photographs and cards with evocative pictures to stimulate ideas, integrated into some of the interviews;
- A focus group with staff working in a children's home;
- Rich pictures (i.e., visual depictions of the problem situation using drawings and arrows showing the links between key issues) [134];
- A synergistic combination of two systemic planning approaches—interactive planning [38,149]

and critical systems heuristics [64,65]—to enable both the young people and professionals to separately design new services in a manner that enabled critical thinking about boundary judgments;
- Values mapping (a new method we developed to visualize people's values and the logical connections between them);
- Small group, multi-agency action planning;
- The production of reports, magazines, and posters for multi-audience dissemination; and
- Formative evaluation using feedback questionnaires filled in by participants.

In my view, no single, previously existing methodology was able to provide all the methods needed for this project. Methodological pluralism was absolutely necessary.

Conclusion: The Added Value of Systemic Intervention

Arguably, the main added value of systemic intervention compared with earlier systems approaches is the synergy between boundary critique and methodological pluralism [6,131,153,154]. If boundary critique is practiced on its own, it is possible to generate some interesting sociological analyses, but there is a danger that these will not effect change unless other more action-oriented methods are used too. Also, embracing methodological pluralism without up-front boundary critique can give rise to superficial diagnoses of problematic situations: if a complex issue is defined from only one limited perspective (such as a client's), without reflecting on values and boundaries, and issues of conflict and marginalization are neglected, then the outcome could be the use of a systems approach that misses or even exacerbates significant social problems. The synergy between boundary critique and methodological pluralism ensures that each aspect of systemic intervention corrects the potential weaknesses of the other.

I suggest that this kind of approach is not only able to address values, boundaries, conflicts and processes of marginalization in defining complex issues, but it also has the potential to deliver all the utility of other systems approaches, such as those discussed in the rest of this *Handbook*. This is because it explicitly advocates learning about and drawing methods from those approaches to deliver maximum flexibility and responsiveness in systemic interventions.

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