

Toward a Values-Informed Approach to Complexity in Health Care: Hermeneutic Review

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Policy Points:

- The concept of value complexity (complexity arising from differences in people's worldviews, interests, and values, leading to mistrust, misunderstanding, and conflict among stakeholders) is introduced and explained.
- Relevant literature from multiple disciplines is reviewed.
- Key theoretical themes, including power, conflict, language and framing, meaning-making, and collective deliberation, are identified.
- Simple rules derived from these theoretical themes are proposed.

Keywords: complexity, value complexity, quality improvement, pragmatism, narrative, hermeneutic review.

MORE THAN 20 YEARS AGO, A SERIES OF ARTICLES IN THE *British Medical Journal* introduced a novel approach to innovation and change, referred to as “complexity thinking” or “complexity theory,” which emphasized the dynamic and unpredictable nature of health care systems.^{1–4} That series, along with other conceptual papers published at the time,^{5–7} have been widely cited and informed policies, programs, and research studies around the world. However, these early articles, which depicted complexity in broadly mathematical

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terms, missed—or, at best, failed sufficiently to emphasize—a key aspect of complexity in health care systems: human values.

In this review paper, we explore the crucial contribution of human values to complex interaction and change. In the form of “simple rules,” we offer some preliminary recommendations for a more contemporary and values-informed approach to complexity in health care. We invite a new generation of research to extend the existing evidence base.

Complexity in Health Care: Missing Values

By complexity, we mean “a dynamic and constantly emerging set of processes and objects that not only interact with each other, but come to be defined by those interactions.”^{8p42} Defining features of complex systems include nonlinearity (small inputs may have large effects and vice versa), path dependency (initial conditions shape how a phenomenon subsequently unfolds), adaptation and self-organization (agents need to constantly respond to local changes, and health organizations need to continually adapt to a changing context in a way that is true to their mission and values), interconnectedness and interdependency (it is impossible to deconstruct the system into components that can be separately analyzed), fuzzy boundaries (the system is open and permeable), and inherent paradoxes that cannot be resolved.^{1,9–12}

Early papers on complexity thinking in health care positioned this new approach as an antidote to prevailing linear and reductionist thinking in medicine, in which a fixed input to a system was often assumed to have a fixed and predictable output (as illustrated, for example, by a randomized controlled trial designed to generate a more or less universally applicable “effect size”).^{1–7} Various models and frameworks were produced; for example, the Cynefin framework (from a Welsh word depicting how we are influenced in ways we can never fully understand by multiple factors in our environment and our experience), which recommends different approaches to leadership depending on whether the context is—in increasing levels of complexity—simple, complicated, complex, chaotic, or disordered.¹³

Although the authors of these papers were well aware of the human actions and interactions on which health care depends, they drew primarily on metaphors and examples taken from disciplines such as

mathematical modeling, economics, computer science, neural networks, and artificial intelligence (“chaos theory,” “fractals,” “nonlinear dynamics,” “randomness”). In that literature, human beings were either overlooked or included implicitly rather than explicitly.¹⁴

The world has moved on considerably since the early 2000s. It is more complex not just in mathematical terms (more components, more interactions, more interdependencies) but also in *human* and *political* terms (more at stake for more people, more disagreements about what the problem is and how to address it, more clashes among interest groups). In short, *real-world complexity* is not only (or even primarily) a mathematical phenomenon; it is a human, social, and political one characterized by strongly held values, contested meanings, and stakeholder conflicts.^{9,11} It requires not merely generalizable, abstract, and formal knowledge but also what Polanyi¹⁵ and Tsoukas¹⁶ have called “complex knowledge”—including embodied, intersubjective, collective, and distributed elements.

The human and political dimension of complexity is illustrated by what have become known as “grand challenges,” such as the climate emergency.¹⁷ These are often presented as grand in difficulty (multiple interacting components), grand in scope (extended temporal or spatial scale), or both¹⁸ and as requiring a heroic, all-out collaborative effort.¹⁹ Such framings emphasize the *mathematical* (or *structural*) *complexity* arising from the sheer number of components and interactions in a system and resulting logistical challenges. However, another key feature of grand challenges is that they are *grand in wickedness*—that is, putting scale and logistics aside, they resist definitive description or clear solutions, they are inherently unpredictable, and efforts to address them often generate conflict among stakeholders.²⁰ In other words, they also exhibit *value* (or *normative*) *complexity*,^{21,22} which we define as *complexity that arises from differences in worldviews, interests, and values, leading to mistrust, misunderstanding, and conflict among stakeholders*.

Clashing Values—Three Case Examples

Box 1 describes three cases of change efforts in health care that stalled. Each involved a clash of values. In case 1, not all staff charged with issuing global positioning system (GPS) tracking devices to clients with cognitive impairment felt it was morally acceptable to electronically

“tag” another human being.²³ In case 2, experts from different scientific disciplines came to widely different conclusions about how COVID-19 is transmitted.²⁸ In case 3, experienced vocationally trained nurses rejected policymakers’ assumption that degree-trained (and sometimes clinically inexperienced) nurses could “supervise” their patient-facing work.²⁶

BOX 1: Three cases

Case 1: In a socioeconomically deprived and multiethnic UK borough, the local council sought to address the problem of “wandering” by people with cognitive impairment.²³ The envisaged solution was a global positioning system (GPS) technology worn on the wrist and linked to a central call center, allowing a lost person to be quickly traced and rescued if needed. An estimated 1,500 people in the borough had cognitive decline, but after a 3-year implementation effort, only 11 had ever tried the technology, and just three were still using it.²⁴

Case 2: The World Health Organization (WHO)’s initial advice to the public on COVID-19 was to wash hands, sneeze into a tissue, and maintain a physical distance of 1–2 meters.²⁵ These measures assumed that the primary mode of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) transmission was by droplets, and reflected the views of a prominent WHO committee whose membership was mostly infectious diseases doctors. They were skeptical of the value of facemasks because randomized controlled trial evidence was lacking. Aerosol scientists (chemists and engineers), in contrast, believed that the virus was airborne and that facemasks and attention to indoor air quality were essential for controlling the pandemic. These different groups of experts publicly briefed against one another, each describing the other’s evidence as weak.

Case 3: In 2019, a high-profile dispute emerged between the government and part of the nursing profession in the Netherlands.²⁶ The government, backed by the nursing association, sought to introduce a statutory distinction between degree-qualified and vocationally trained nurses, with the aim of supporting and repositioning more highly educated nurses and thereby (it claimed) “professionalizing” nursing. The amendment was met with fierce opposition from the vocationally trained part of the nursing community—backed by some highly visible doctors who wanted to protect their “Cinderellas,” the staff who performed day-to-day unglamorous labor without recognition (thus neglecting their clinical and organizational work).²⁷ Nurses’ vocal rebuttal

on social media used the polarizing language of “genuine” versus “elite” nurses. The proposed amendment was eventually withdrawn.

We discuss these cases in more detail below and elsewhere.^{23,24,26,28–30}

Aim of the Review

We sought to identify, explore, and synthesize the academic literature relevant to value complexity in health care. We acknowledge that many of the concepts and ideas presented here have been addressed previously in disparate streams of scholarship, though these streams have mostly unfolded in parallel rather than in dialogue with one another. We did not set out to produce a framework or protocol that could be applied formulaically because (for example) complex systems are unpredictable and goals may reasonably change as projects unfold. It is already well established, for example, that a complexity approach to real-world projects, programs, and change efforts would usually seek incremental and negotiated progress, keeping a universal goal in mind but attending to local realities such as path dependencies, priorities, and sensitivities and using local learning to refine ideas and plans.^{31–33} Rather, we aimed to produce a “theory in the wild,” which we define as *a theory grounded in local, real-world action and oriented to generating learning through action*—for addressing value complexity in complex change efforts involving multi-stakeholder partnerships. We sought to present this theory not as fixed predictive statements but as a set of heuristics or *rules of thumb*—that is, points of departure for reflection and situated moral reasoning (“thinking through” or “working through” real-world challenges).^{34,35} In the language of some complexity theorists, these might be termed “simple rules.”^{1,36}

Our research question was as follows: “How should we conceptualize, theorize, and address the different ways in which conflicting stakeholder values add to a project’s complexity and thwart the change effort?”

Method

We used hermeneutic methodology, the goal of which is to *deepen understanding* of complex phenomena rather than produce an encyclopedic

inventory of every published source.³⁷ Given that the focus of our review was human values, the potentially relevant literature was vast. We considered that a “deep dive” into a small sample of traditions would generate richer insights than a superficial sweep of wider literature.

Sensitized by critical interpretive synthesis³⁸ and metanarrative review,^{39,40} we identified, through discussion, research traditions relevant to value complexity. These reflected our disciplinary backgrounds—medicine and health policy (T.G.), improvement sciences (S.K.), humanities (E.E.), and social sciences (R.B.). Guided by our research question, we began with known sources that were well regarded and highly cited in these fields. Using snowball searching (e.g., citation tracking via Google Scholar), we iteratively refined our disciplinary summaries.

In a synthesis phase, we discussed commonalities and differences across traditions. We oriented our synthesis to producing “rules of thumb”—points of departure for situated moral reasoning—that emerged as we discussed how to address key themes. For example, the finding that metrics contain inscribed values about what is important to measure led (through discussion) to a rule of thumb “question metrics.” Using empirical case studies (see, e.g., Box 1), we tested and refined these rules.

This work comprises desk research, so formal research ethics approval was not needed. All material used is in the public domain, as it is based on published sources. The paper describes a collaborative effort to summarize complex literature. All authors worked to search for, appraise, and summarize sources in their field of expertise. All collaborated on a cross-disciplinary synthesis. The lead author wrote the initial draft of the paper, which other authors amended by discussion. All authors approved the final paper.

Results

Overview

The included research traditions are summarized in Table 1. They had much in common but differed in scope, philosophical assumptions, and theoretical focus. Below, we outline these traditions, list the rules of thumb we derived from them, and apply the rules to the case examples in Box 1.

Table 1. Summary of Included Research Traditions

Tradition (Key Scholars)	Key Ideas and Principles	Preferred Methods	Relevant Insights for Value Complexity Research
WSQI (e.g., Deming, ⁴¹ Donabedian, ⁴² McNab et al., ⁴³ Batalden et al., ⁴⁴ Batalden and Davidoff, ⁴⁵ Batalden and Stoltz, ⁴⁶ Dixon-Woods et al., ⁴⁷ Bate et al. ⁴⁸)	<ul style="list-style-type: none"> Understand the system (e.g., interdependencies, workflows) Analyze variation Learn from real-world data Develop capable leaders for system transformation 	<ul style="list-style-type: none"> Balanced measures on system level (e.g., in plan-do-study-act cycles) Qualitative interviews Partnership building with patients Developing leadership through reflective practice Experience-based codesign 	<ul style="list-style-type: none"> A management system based on simple rules and trusting partnerships All people are improvers Narratives of patient experience can be powerful drivers for improvement
Pragmatist philosophy (e.g., Peirce, ⁴⁹ Misak, ⁵⁰ Dewey ⁵¹)	<ul style="list-style-type: none"> Knowledge is (must be) closely linked to action Science is fallible; certain truth will always elude us Epistemological pluralism (there are multiple ways of knowing) 	<ul style="list-style-type: none"> Engage collectively with a real-world problem or issue Collect a wide range of data to test hypotheses in the real world Value diversity of perspectives, including people's experiential knowledge Deliberate and reflect on areas of doubt 	<ul style="list-style-type: none"> Evidence about values should be brought to the table and discussed along with scientific findings How people view the world and frame issues affects whether and how they act

Continued

Table 1. (Continued)

Tradition (Key Scholars)	Key Ideas and Principles	Preferred Methods	Relevant Insights for Value Complexity Research
STS (e.g., Knorr Cetina, ⁵² Latour, ⁵³ Mol, ⁵⁴ Nowotny et al., ⁵⁵ Oudshoorn and Pinch, ⁵⁶ Tsing ⁵⁷)	<ul style="list-style-type: none"> • Broad field, covers sociology of knowledge, actor-network theory, postnormal, mode 2, and feminist studies • Views science and technology as discursive, social, and material activities 	<ul style="list-style-type: none"> • In-depth case studies using critical ethnography • Discourse analysis • Sociomaterial study of technologies • Analysis of sociotechnical networks • Performative lens, asking, “What is brought into being with these actions?” 	<ul style="list-style-type: none"> • Relationships and partnerships are crucial • Power plays out in complex and subtle ways • Public debate is needed about the societal implications of science and technology
Narrative and rhetoric (e.g., Rapp, ⁵⁸ Fisher, ⁵⁹ Majone, ⁶⁰ Perelman, ⁶¹ Turner ⁶²)	<ul style="list-style-type: none"> • Narratives (stories) give life its meaning • A key purpose of narrative is rhetorical (to persuade) • Narrative has an ethical dimension • The basis of policymaking is storytelling and arguing 	<ul style="list-style-type: none"> • Narrative interviews • Analysis of stories in texts for scene, characterization, plot, and rhetorical moves • Analysis of case studies as social dramas • Rhetorical discourse analysis 	<ul style="list-style-type: none"> • People think in (and gain meaning from) narratives • Collective deliberation is crucial to determining what is right and reasonable in policymaking

Continued

Table 1. (Continued)

Tradition (Key Scholars)	Key Ideas and Principles	Preferred Methods	Relevant Insights for Value Complexity Research
Deconstructive political philosophy (e.g., Derrida, ⁶³ Kristeva, ⁶⁴ Mouffe, ⁶⁵ Mouffe, ⁶⁶ Foucault ⁶⁷)	<ul style="list-style-type: none"> • Texts and concepts contain hidden assumptions and contradictions • Words, expressions, and mental models constrain scientific, policy, and public thinking 	<ul style="list-style-type: none"> • Deconstruction (critical close reading of texts) to reveal hidden meanings • Analysis of disagreements and conflicts based on group identity (“we” and “them”) 	<ul style="list-style-type: none"> • Conflict and antagonism are inherent in society • Effective political action requires us to surface these conflicts and harness productive disagreement

Abbreviations: STS, science and technology studies; WSQI, whole-system quality improvement.

Tradition 1: Whole-System Quality Improvement

Whole-system quality improvement (WSQI) began as a US movement in the 1990s/2000s,⁶⁸ drawing on Deming's work on quality in organizations⁴¹ that emphasized the need to a) understand the system (especially its interdependencies and workflows), b) analyze variations within the system, c) learn continuously from real-world data, and d) develop capable leaders.^{41–43,45,68–70} Adapting a total quality management approach that had transformed the Japanese car industry, WSQI in health care sought to improve efficiency, reduce waste, treat upstream causes (hence preventing disease), and help all services approach the standards of excellence achieved by the best. However, changing health systems proved difficult because structures and processes of work are institutionally embedded, and people may be wary of imposed directions of change.

Conventional WSQI has been criticized for making linear assumptions and overlooking social science and human values.^{47,48} Adaptations of the WSQI model have placed greater emphasis on building trusting partnerships, sharing power democratically and agreeing on goals, sensemaking collectively, and coproducing change.^{44,46–48,71–73} These approaches recognize that people's willingness to accept change and strive to achieve it depends on their *values*; transforming a system may first require *personal transformation* to develop qualities such as insight, imagination, courage, and the ability to reason reflexively with others.^{74,75} As Ostrom showed, collective action will help in avoiding the tragedy of the commons as people are able to see their interdependencies and common interests.

Tradition 2: Pragmatist Philosophy

Pragmatism is a branch of applied philosophy based on the *pragmatic maxim*—that concepts and theories should link closely to experience, practice, expectations, and consequences.^{49,51,76} For pragmatists, the value of an idea depends on how it fares in action. Truth is to be found not in generalities and abstractions but in the usefulness of knowledge for informing actions in context.⁷⁷ Pragmatists reject the idea that knowledge is first produced and then applied in practice. Rather, they consider that knowledge can be explained only in terms of (and evoked within) practice.⁷⁸ Pragmatists hold that science is fallible; its

truths are provisional because theories are always underdetermined by available facts, and facts can be explained by more than one theory. The pragmatist notion that we can never achieve certainty so must learn to work with *uncertainty* reframes science as an ongoing process of hypothesis-testing, occurring mostly in the real world. This rests on a broad, inclusionary epistemology encompassing “*the full range of human capacities, material, moral, and aesthetic,*”⁷⁹p287 which are all relevant to what Healey calls the “*art of judgment*” in public policy contexts.⁷⁹ Pragmatism emphasizes “human logic” (how people understand the world, deal with doubt, and reason about how the future will unfold) and the symbolic meanings that events, actions, and objects hold for them. It stresses that research approaches need to match the complexity of what is being studied; system-level problems need to be studied in all their richness rather than simplifying them into relationships among a limited set of variables. Pragmatism emphasizes the importance of collecting and analyzing data *with* rather than *on* or *for* partner communities. Crucial to this process is the need to value the practical wisdom (a concept originally developed by Aristotle) and lived experience of practitioners and citizens (especially the marginalized and oppressed).⁸⁰

Tradition 3: Science and Technology Studies

Science and technology studies (STS) is an interdisciplinary field drawing on sociology, anthropology, history, philosophy, and more. It is concerned with understanding science and technology as discursive, social, and material activities. It questions the place of scientific and technological expertise in the public sphere and the place of public interests in scientific decision making. STS is a broad church, embracing (but not limited to) sociology of knowledge, social constructionism, feminism and postfeminism, actor-network theory, postnormal science, mode 2 science, posthuman studies, and the political economy of knowledge.⁸¹ In contrast to rationalist paradigms such as evidence-based medicine that see the world as a “given” that needs to be “discovered” through research and then represented and acted on, STS, much like pragmatism, views the social and natural world as *constructed* through practical activities, including research.⁸²

Feminist-informed STS emphasizes the relationality of objects and subjects⁸³ and highlights the epistemic injustice when research and

policies leave out less powerful voices.⁸⁴ It recommends reflexive engagement to build trusting relationships, as the trustworthiness of knowledge is assured partly by how democratically it has been produced and whether the societal implications have been adequately debated.⁸⁵ STS views research evidence and technologies not as neutral tools but as actively contributing to particular versions of the world, including distributions of power. It depicts knowledge production as a translational act through which various sources of knowledge, experience, and expertise are continuously recontextualized and applied. For example, STS scholars study how power differentials and knowledge orthodoxies come to be inscribed in software, guidelines, and regulatory frameworks.⁸⁶

Tradition 4: Narrative and Rhetoric

This tradition originates in literature and drama and has wide applications across many disciplines including political science, social policy, and history.^{58–60} A narrative is a chronological account of events and actions involving characters (of greater or lesser virtue), a setting, a scene, and a plot that is conveyed through literary devices such as metaphor, suspense, and surprise. Storytelling is how humans make sense of their world both retrospectively (sensemaking) and prospectively (envisioning the future).⁸⁷

Narratives are not just stories that people tell; we live our lives through narratives, and a collaborative change effort is a kind of narrative drama. A key purpose of a narrative is to persuade—hence the value of storytelling and rhetoric in collective deliberation and policymaking.^{59,60} Aristotle proposed three key dimensions of oratory (giving persuasive speeches): *logos* (evidence), *ethos* (the credibility of the speaker or writer), and *pathos* (the appeal to emotions).⁵⁸ Narrative has an important ethical dimension, and narrative (or practical) rationality relates to what is right and reasonable in a particular set of unfolding circumstances.⁸⁸ As Perelman (among others) has argued, engagement with one's audience's worldview and "points of departure" (i.e., prior assumptions) is key to effective political argumentation and persuasion.⁶¹

Tradition 5: Deconstructive Political Philosophy

This tradition is based on an approach to critical analysis associated with the French philosopher Jacques Derrida; it seeks to expose unquestioned

assumptions (often binaries such as “we” versus “them”) and contradictions in texts.⁸⁹ Close reading, including studying intertextuality (how one text echoes another⁶⁴) will allow us to deconstruct the concepts, expressions, mental models, and social practices that shape and constrain scientific, policy, and public thinking. This will help us surface and engage with the value complexity that lies at the heart of much policy paralysis.

The literature on partnership working in health and social care, for example, is often consensus focused and assumes a goal of harmonious agreement—indeed “shared vision” is often depicted as the starting point for collective action. A deconstructive approach, in contrast, acknowledges that conflict and antagonism are permanent features of the real world and accepts that “a perfect consensus, a harmonious collective ... must therefore be abandoned.”⁶⁵ Deconstruction has been used by political philosopher Chantal Mouffe to develop novel ways of studying and harnessing stakeholder conflict. Inspired by Derrida’s work on difference,⁶³ Mouffe claims that the production of identity is also the production of difference (to constitute a “we” always requires a “them”).⁹⁰ Effective political action and change can grow only from harnessing difference and productive disagreement (“agonistic pluralism”). Applying Mouffe’s ideas to change partnerships reframes conflicts not as obstacles to be overcome but as a constitutive aspect of democratic, bottom-up approaches that *draw productively on* value complexity and plural positions rather than reducing them to consensus.

Synthesis: Ten Rules of Thumb

Across the above five traditions, a number of broad principles recurred that support some provisional rules of thumb. Although not every principle was evident in every tradition, there was much overlap between them.

Rule 1: Partnership Process Is Mission Critical. Complex projects are delivered via partnerships, which must be organized and governed in a way that builds trust, assures the psychological safety of all stakeholders, and supports rather than constrains collective action.^{91–93} Rationalist values and efficiency framings tend to overemphasize partnership *outputs* (milestones, deliverables) at the expense of process.⁹⁴ The change effort becomes formulaic, oriented narrowly to a promised product (e.g.,

a “codesigned” technology⁹⁵) while overlooking the need for psychological safety with teams⁹¹ and the relationship-building and power-sharing work needed to develop trust and achieve the partnership synergies on which action depends.⁹²

Rule 2: Be Alert to the Complex and Subtle Ways in Which Power Plays Out. It is a truism that partnerships should be democratic. However, power-sharing policies are often based on a naïve and dichotomous model of power (e.g., assuming that doctors have power, but patients do not). Such an approach, although well intentioned, may have the unintended effect of rendering key voices “docile” by reducing them to a category of people who are “empowered” to speak in certain well-defined circumstances and ways.⁹⁶ Such approaches may inadvertently reinforce the problem they seek to solve. Power differentials in change partnerships may benefit from a deeper, more critical analysis.^{97–101} For example, critical analysis of arguments, disputes, and procedures can reveal how *epistemic* power is wielded (some kinds of knowledge are valued, whereas other kinds are ignored).^{52,102–104}

Rule 3: Engage with Conflict, Which Can Be a Positive Force. Rationalist models depict change as a nonpolitical and consensus-driven process in which conflict does not (or should not) exist. While “shared vision” is typically hailed as the starting point for change partnerships, value complexity is *inherently* conflictual,^{65,105} hence apparent consensus is an illusion in which less powerful voices are silenced. Examining conflict (for example, surfacing and exploring *why* people feel so strongly about a particular issue) can be a potent means by which diverse partnerships can come to understand their differences and develop the multifaceted approaches needed to achieve action in change partnerships.^{57,66,106}

Rule 4: Carefully Examine Language, Which Shapes How We See Issues. Policy is made of language.^{59,60,107,108} All texts (including scientific papers) serve a rhetorical purpose.¹⁰⁹ As our case studies (Box 1 and below) illustrate, language incorporates assumptions and values; it frames how we see issues,¹¹⁰ creating possibilities but also *limiting what we view as possible*.⁶¹ To illuminate why actors view issues so differently, we must examine the work done by language.

Rule 5: Ask What Hidden Value Judgments Technologies Contain. Digital technologies inscribe, reproduce, and sometimes ossify value-based human judgments. Software, for example, “configures the user” (that is, it includes built-in assumptions about who will use it and how—for example, via the limited choices offered in pull-down menus).¹¹¹ Language

in digital form may appear legitimate and “factual.”^{112,113} Digitization of services may create new forms of inequity and social exclusion.¹¹⁴

Rule 6: Question Numbers, Metrics, and Charts. Scientists, policymakers, and interest groups select particular numbers and metrics and present them visually to support a preferred view or argument (e.g., that what is being counted *stands for* progress in addressing a problem).¹¹⁵ A critical approach to partnerships asks questions about where the numbers and diagrams that are being brought into play came from, whose interests they serve, and how they perform specific realities.^{116–119}

Rule 7: Encourage Frame Awareness for Mutual Understanding. How people view the world and reason about it strongly influences how they engage with a situation and whether and how they act.¹²⁰ Supporting stakeholders to understand where other groups in a partnership are “coming from” (*frame-reflexive awareness*¹¹⁰) helps them construct arguments that are more likely to appeal to those parties, and builds the intersubjective understandings needed to work harmoniously *despite* differences in values.¹²⁰ Frames are often institutionalized in procedures and institutional set-ups, making it important to study their history (and path dependency) as well as how they shape current action.¹²¹

Rule 8: Contemplate on Uncertainty. Uncertainty is inherent to complex, real-world projects.¹²² Those who disregard it risk the “illusion of explanatory depth”: a mistaken sense of knowing arising when they feel they understand complex phenomena with more precision, coherence, and depth than they actually do.¹²³ Uncertainty can be of different kinds—for example, in relation to the relevance, completeness, and trustworthiness of data, but also in relation to how actors make sense of those issues and what value they assign to them.⁴⁹ Engaging with uncertainty requires human qualities like courage, humility, and flexibility.¹²³

Rule 9: Use Deliberation to Plan Collective Action. Even when scientific evidence on a topic is strong (and more so when evidence is weak or contested), science does not *determine* real-world action.¹²⁴ Rather, we need to *deliberate* on what to do (and when and how) because policies must take account of—for example—local constraints, budgets, incentives, and stakeholders’ differing priorities and values.^{60,125} Deliberation requires evidence about these priorities and values. It also requires human qualities such as curiosity, imagination, reflexivity, and respect for positions that differ from one’s own.

Rule 10: Creative Action Cannot Be Scripted. Because of the unique, emergent, and multifaceted nature of real-world situations,

generalizable knowledge (e.g., from randomized controlled trials) and standardized interventions (even if “evidence based” and “theory informed”) can inform but not determine action.¹²⁶ Real-world challenges require an ongoing cycle of data collection, analysis, and “tinkering” (trying things out and seeing if they work).

Applying the Rules of Thumb to Case Examples

We now return to the case examples from Box 1 and consider how our ten rules of thumb can enrich our explanations of how they unfolded. Because value complexity is deep-rooted and multimodal—it is built into concepts and ideologies, technologies, everyday practices, and narratives—there is no single way of addressing it. In each case, different rules were salient to the real-world challenge.

Case 1: GPS Tracking for Cognitive Impairment. Cognitive impairment and its impact on a person and their family follows an individual, uncertain, and nonlinear course (rule 8). A desire to walk outside the home is common but not universal, for example. Stakeholders used different language to describe and frame the issue (rule 4); doctors depicted walking outdoors by cognitively impaired people (“wandering,” “hyperactivity,” “disorientated activity”) as meaningless and unnecessary, whereas the individuals themselves depicted it as meaningful and worthwhile (“going for a walk,” “getting outside,” “shopping”).²⁴ The GPS tracking devices inscribed a set of assumptions and values about electronic tagging and tracking (rule 5).^{23,24} One feature, for example, was the “geofence” (a geographical boundary programmed into the device); an alert was triggered if the wearer strayed beyond this boundary. This technology had originally been designed for use in the criminal justice system—for example, to help enforce house arrest. Industry representatives framed the GPS tracking devices and their associated call center support as a “risk management service,” and referred to the geofence as a “safety zone.” Front-line social work staff, in contrast, interpreted the devices as coercive, restrictive, and undignified (“like a dog,” “granny tagging”) and as interfering with their professional role of supporting vulnerable people to remain independent and fulfilled. These framings were rarely made explicit, and different parties generally did not understand how strongly others felt or why (rule 7). The few individuals who successfully used the devices all required a highly

personalized sociotechnical solution involving not merely a customized GPS device but also a network of lay and professional carers who collaborated to make the system work in practice (rule 10). Failure to scale the GPS technology was explained largely in terms of competing framings of what the problem was (and indeed whether “wandering” was a problem at all), what the proposed technological solution *meant*, and the high degree of ongoing adaptive tinkering needed.

Case 2: Polarized Narratives About the COVID-19 Pandemic. As the COVID-19 pandemic unfolded, multiple narratives or “framings” emerged of how the virus was transmitted (rule 7),⁸⁸ leading to bitter conflicts among experts (rule 3). Infectious disease clinicians advising the World Health Organization (WHO) were mostly hospital based and focused on preventing cross-infection of contact-spread diseases; trained in evidence-based medicine, they greatly valued randomized controlled trials and meta-analyses of those trials.²⁹ Aerosol scientists, on the other hand, did not see randomized trials as having privileged status; they placed greater value on the evidence inscribed in official filtration standards for respiratory protective equipment and industrial filters.¹²⁷ These groups used different language (rule 4); infectious disease clinicians talked of “droplet nuclei” (very small droplets that become airborne), whereas aerosol scientists simply said “airborne” and rejected the term “droplet nuclei” as discredited, confusing, and based on an overcited, decades’ old experiment¹²⁸ that had used faulty equipment.³⁰ Different diagrams and charts representing the “state of the science” circulated and gained ground within each expert group but had no currency in rival groups (rule 6). The infectious disease experts held considerable power within the WHO (rule 2) and blocked the aerosol scientists’ offer¹²⁹ to provide advice.²⁸ A Lancet Commission report on COVID-19 published in September 2022 identified delayed recognition of the airborne nature of the virus as a leading cause of avoidable deaths worldwide.¹³⁰

Case 3: The “Dutch Nurse Revolt”. In case 3,²⁶ the proposed policy to split the nursing profession into vocationally trained and degree trained was introduced to tackle the issue that academically trained nurses have limited career prospects in Dutch health care and often leave the workforce. Although the Minister of Health claimed that it had been collaboratively developed with input from the nursing association, expert committees, and employers, presenting such a controversial and politically sensitive policy as *already agreed on* illustrates the perils of

false consensus (rule 3). Either dissenting voices—mostly vocationally trained nurses with specialized skills—had been excluded from the negotiating table or they were silenced through complex power dynamics as the high-level discussions were held (rule 2). The so-called collaboration appears to have been assembled instrumentally for political ends to deliver a predecided output, so processes designed to build trust and establish true partnership synergies were rendered redundant (rule 1). Rank-and-file nurses protested swiftly and forcefully, accusing their own professional body of betraying their trust and depicting as epistemic violence the assumption that recently qualified degree-trained nurses equipped with classroom knowledge could supervise and manage the kinds of practical work honed from years of hands-on nursing experience (rule 7), framing the proposed legislation as one of creating a hierarchy of nurses (rule 4). Nurses' organized resistance to the new policy played out in strongly populist and (in Mouffe's terminology⁶⁶) antagonistic terms as “we,” the common people—in this case, vocationally trained and clinically experienced nurses—versus “them,” the corrupt elite—in this case, academically trained nurses and the nursing association (rule 3).

Discussion

Summary of Key Findings

This hermeneutic review of five research traditions—WSQI, pragmatist philosophy, STS, narrative and rhetoric, and deconstructive political philosophy—extends the literature on complexity in health care by identifying concepts and explanations for why change partnerships may fail to achieve their goals in the face of value complexity. Ten recurring influences deserve attention: partnership process (especially how trust is built and maintained), power (including subtle and hidden forms), conflict (and how this may be harnessed productively), language and framing, numbers and metrics, technologies (which contain inscribed human values), frame awareness, uncertainty (and how well it is tolerated), collective deliberation (whether and how it occurs), and “tinkering” (creative adaptation to overcome local challenges). These influences helped explain our empirical examples (Box 1).

Comparison with Existing Literature

Our review builds on a small existing literature on value complexity in health care. Cribb introduced the concept of normative (i.e., value) complexity¹³¹ and explored its implications with other authors,¹³² arguing that key to addressing it is *conversations*—a concept that chimes well with our own findings about the need for frame awareness and deliberation. They cite two approaches from the quality improvement literature—experience-based codesign¹³³ and Schwartz rounds^{134,135}—as techniques that include “facilitated” conversations, and they highlight the importance of less-scripted approaches such as informal “small talk” among clinicians and patients and “catch-up” conversations among professionals. Cribb and colleagues suggest that these interactions are primarily relational rather than transactional and help build mutual understanding, commitment, and trust.¹³¹ They write predominantly from within the quality improvement and nursing scholarship literature, highlighting the need to hone the human qualities of empathy and compassion. We have much sympathy with these perspectives but take a somewhat broader approach, including health policy and politics, in which value complexities are rife.

Strengths and Limitations of the Study

This review is the first to synthesize research from multiple traditions both within and outside the health care literature with an explicit focus on value complexity. Hermeneutic methods enabled us to tease out and synthesize meaning, leading to enriched understanding of how change partnerships work and why they fail. By working collaboratively and critically across multiple traditions, we have shown how a number of important concepts recur across applied health and care, social sciences, and humanities. For example, our review challenges the ubiquitous assumption that consensus is both possible and desirable and that “shared vision” should be the starting point for change efforts. A major limitation of this study is that we selected only five research traditions. Additional insights might be gained from further in-depth analysis of other traditions such as history, social psychology, organizational studies, public administration, and political science. Another limitation is that the simple rules we have produced have yet to be tested empirically in prospective case studies—a task we plan to undertake in future research.

Conclusion

Achieving action in the face of value complexity is both a philosophical and a practical challenge. It requires researchers, policymakers, and change agents to shift from “simplifying” (for example, undertaking controlled experiments oriented to generating more or less universal truths) to “complexifying” (that is, developing an approach that is grounded in concrete real-world situations and faithful to complexity’s inherent features).¹⁶ Acknowledging that complex systems are relational and self-organizing, for example, we must find ways of supporting people to produce interventions and actions that are intelligent and lead to success in particular local circumstances.^{136,137} Acknowledging that uncertainty is an inherent feature of a complex system, we must find ways of working *with* uncertainty rather than waiting for definitive truths or *acting as if* we were certain. Acknowledging that tensions and paradoxes are unresolvable, we must eschew false consensus and instead celebrate and harness the many and conflicting perspectives that local actors bring to a collaborative effort. By attending to the relational aspects of partnerships and examining and harnessing the “frictions” that occur in them,⁵⁷ we will be better able to optimize the human actions needed to address complexity—engaging, sensemaking, deliberating, tinkering, dealing with conflict, and so on.

These changes require a shift in how complexity is conceptualized: not as an abstract theory grounded in mathematical concepts but as a theory that *comes into play through human action and interaction*. The ten rules of thumb we have presented above, drawn from multiple disciplines, form a provisional *theory in the wild*—that is, a theory that is grounded in local, real-world action and oriented to generating learning *through* action. We offer these rules not as definitive guidance but as the starting point for further debate and empirical study. We invite others to test and improve them as they address value complexity in their own projects and settings.

References

1. Plsek PE, Greenhalgh T. Complexity science: the challenge of complexity in health care. *BMJ*. 2001;323(7313):625-628.
2. Plsek PE, Wilson T, Greenhalgh T. Complexity, leadership and management in healthcare organisations. *BMJ*. 2001;323(7315):746-749.

3. Wilson T, Holt T, Greenhalgh T. Complexity science: complexity and clinical care. *BMJ*. 2001;323(7314):685-688.
4. Fraser SW, Greenhalgh T. Coping with complexity: educating for capability. *BMJ*. 2001;323(7316):799-803.
5. Anderson RA, McDaniel Jr. RR. Managing health care organizations: where professionalism meets complexity science. *Health Care Manage Rev*. 2000;25(1):83-92.
6. Miller WL, Crabtree BF, McDaniel R, Stange KC. Understanding change in primary care practice using complexity theory. *J Fam Pract*. 1998;46(5):369-376.
7. Taylor JS. A complexity science primer: what is complexity science and why should I learn about it. Adapted from: *Edgware: Lessons From Complexity Science for Health Care Leaders*. Comput Sci. 2015.
8. Cohn S, Clinch M, Bunn C, Stronge P. Entangled complexity: why complex interventions are just not complicated enough. *J Health Serv Res Policy*. 2013;18(1):40-43.
9. Greenhalgh T, Papoutsi C. Studying complexity in health services research: desperately seeking an overdue paradigm shift. *BMC Med*. 2018;16(1):95.
10. Byrne D. *Complexity Theory and the Social Sciences: An Introduction*. Routledge; 2002.
11. Byrne D, Callaghan G. *Complexity Theory and the Social Sciences: The State of the Art*. Routledge; 2013.
12. Sturmberg JP. *Health System Redesign: How to Make Health Care Person-Centered, Equitable, and Sustainable*. 1st ed. Springer; 2018.
13. Snowden DJ, Boone ME. A leader's framework for decision making. *Harv Bus Rev*. 2007;85(11):68-76.
14. Waldrop M. *Complexity: The Emerging Science at the Edge of Order and Chaos*. Simon and Schuster; 1992.
15. Polanyi M. *Personal Knowledge. Towards a Post-Critical Philosophy*. Routledge; 1958.
16. Tsoukas H. Don't simplify, complexify: from disjunctive to conjunctive theorizing in organization and management studies. *J Manag Stud*. 2017;54(2):132-153.
17. Kuhlmann S, Rip A. Next generation science policy and Grand Challenges. In: Simon D, Kuhlmann S, Stamm J, Canzler W, eds. *Handbook on Science and Public Policy*. Edward Elgar Publishing; 2019:12-25.
18. Efstathiou S. Is it possible to give scientific solutions to Grand Challenges? On the idea of grand challenges for life science research. *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences*. Vol

56. Elsevier; 2016:48-61. <https://doi.org/10.1016/j.shpsc.2015.10.009>
19. Kaldewey D. The grand challenges discourse: transforming identity work in science and science policy. *Minerva*. 2018;56(2):161-182.
 20. Rittel HW, Webber MM. Dilemmas in a general theory of planning. *Policy Sci*. 1973;4(2):155-169.
 21. Maylor HR, Turner NW, Murray-Webster R. How hard can it be?: actively managing complexity in technology projects. *Res Technol Manag*. 2013;56(4):45-51.
 22. Broer T, Bal R, Pickersgill M. Problematisations of complexity: on the notion and production of diverse complexities in health-care interventions and evaluations. *Sci Cult*. 2017;26(2):135-160.
 23. Greenhalgh T, Wherton J, Papoutsi C, et al. Analysing the role of complexity in explaining the fortunes of technology programmes: empirical application of the NASSS framework. *BMC Med*. 2018;16(1):66.
 24. Wherton J, Greenhalgh T, Procter R, Shaw S, Shaw J. Wandering as a sociomaterial practice: extending the theorization of GPS tracking in cognitive impairment. *Qual Health Res*. 2019;29(3):328-344.
 25. World Health Organization. How is COVID-19 spread and how do you protect yourself against it? Facebook. February 28, 2020. Accessed February 28, 2021. <https://www.facebook.com/WHO/videos/how-is-covid-19-spread-and-how-do-you-protect-yourself-against-it/507223210199209/>
 26. Felder M, Kuijper S, Lalleman P, Bal R, Wallenburg I. The rise of the partisan nurse and the challenge of moving beyond an impasse in the (re)organization of Dutch nursing work. *J Prof Organ*. 2022;9(1):20-37.
 27. Allen D. *The Invisible Work of Nurses: Hospitals, Organisation and Healthcare*. Routledge; 2015. *Routledge Advances in Health and Social Policy*.
 28. Greenhalgh T, Ozbilgin M, Tomlinson D. How COVID-19 spreads: narratives, counter narratives, and social dramas. *BMJ*. 2022;378:e069940.
 29. Greenhalgh T, Ozbilgin M, Contandriopoulos D. Orthodoxy, *illusio*, and playing the scientific game: a Bourdieusian analysis of infection control science in the COVID-19 pandemic. *Wellcome Open Res*. 2021;6(126). <https://doi.org/10.12688/wellcomeopenres.16855.1>
 30. Jimenez JL, Marr LC, Randall K, et al. What were the historical reasons for the resistance to recognizing airborne

- transmission during the COVID-19 pandemic? *Indoor Air*. 2022;32(8):e13070.
31. Parsons W. From muddling through to muddling up-evidence based policy making and the modernisation of British Government. *Public Policy Adm.* 2002;17(3):43-60.
 32. Lipsky M. *Street-Level Bureaucracy: Dilemmas of the Individual in Public Service*. Russell Sage Foundation; 2010.
 33. European Commission. The precautionary principle: decision making under uncertainty. European Commission. September 2017. Accessed April 7, 2020. https://ec.europa.eu/environment/integration/research/newsalert/pdf/precautionary_principle_decision_making_under_uncertainty_FB18_en.pdf
 34. Villadsen K. Jane Addams's pragmatist method extended: care work between abstract rules and situated practice. *Qual Inq.* 2022;28(10). <https://doi.org/10.1177/10778004221097050>
 35. Kristeva J. Thinking about liberty in dark times. Seminar presented at: Holberg Symposium; December 2, 2004; Bergen, Norway. University of Bergen.
 36. Rizzo MJ. Abstract rules for complex systems. *Eur J Law Econ.* 2021;52:209-227.
 37. Greenhalgh T, Thorne S, Malterud K. Time to challenge the spurious hierarchy of systematic over narrative reviews? *Eur J Clin Invest.* 2018;48(6):e12931.
 38. Dixon-Woods M, Cavers D, Agarwal S, et al. Conducting a critical interpretive synthesis of the literature on access to healthcare by vulnerable groups. *BMC Med Res Methodol.* 2006;6(1):1-13.
 39. Greenhalgh T, Robert G, Macfarlane F, Bate P, Kyriakidou O, Peacock R. Storylines of research in diffusion of innovation: a meta-narrative approach to systematic review. *Soc Sci Med.* 2005;61(2):417-430. <https://doi.org/10.1016/j.socscimed.2004.12.001>
 40. Wong G, Greenhalgh T, Westhorp G, Buckingham J, Pawson R. RAMESES publication standards: meta-narrative reviews. *BMC Med.* 2013;11:20. <https://doi.org/10.1186/1741-7015-11-20>
 41. Deming WE. *Out of the Crisis*. MIT Press; 1986.
 42. Donabedian A. *An Introduction to Quality Assurance in Health Care*. Oxford University Press; 2003.
 43. McNab D, McKay J, Shorrock S, Luty S, Bowie P. Development and application of 'systems thinking' principles for quality improvement. *BMJ Open Qual.* 2020;9(1):e000714.
 44. Batalden M, Batalden P, Margolis P, et al. Coproduction of healthcare service. *BMJ Qual Saf.* 2016;25(7):509-517.

45. Batalden PB, Davidoff F. What is “quality improvement” and how can it transform healthcare? *Qual Saf Health Care*. 2007;16(1):2-3.
46. Batalden PB, Stoltz PK. A framework for the continual improvement of health care: building and applying professional and improvement knowledge to test changes in daily work. *Jt Comm J Qual Improv*. 1993;19(10):424-447.
47. Dixon-Woods M, Bosk CL, Aveling EL, Goeschel CA, Pronovost PJ. Explaining Michigan: developing an ex post theory of a quality improvement program. *Milbank Q*. 2011;89(2):167-205.
48. Bate P, Mendel P, Robert G. *Organizing for Quality: The Improvement Journeys of Leading Hospitals in Europe and the United States*. CRC Press; 2007.
49. Peirce CS. *Pragmatism as a Principle and Method of Right Thinking: The 1903 Harvard Lectures on Pragmatism*. SUNY Press; 1997.
50. Misak C. *Cambridge Pragmatism: From Peirce and James to Ramsey and Wittgenstein*. Oxford University Press; 2018.
51. Dewey J. The development of American pragmatism. *Sci Stud*. 2007;5(2):227-243.
52. Knorr Cetina K. *Epistemic Cultures: How the Sciences Make Knowledge*. Harvard University Press; 2009.
53. Latour B. *We Have Never Been Modern*. Harvard University Press; 2012.
54. Mol A. *The Body Multiple: Ontology in Medical Practice*. Duke University Press; 2002.
55. Nowotny H, Scott P, Gibbons M. *Re-Thinking Science: Knowledge and the Public in an Age of Uncertainty*. SciELO Argentina; 2001.
56. Oudshoorn N, Pinch T. *How Users Matter: The Co-Construction of Users and Technology (Inside Technology)*. MIT Press; 2003.
57. Tsing AL. *Friction: An Ethnography of Global Connection*. Princeton University Press; 2011.
58. Rapp C. Aristotle’s rhetoric. Zalta EN, Odelman U, eds. Stanford Encyclopedia of Philosophy. 2022. Accessed May 5, 2023. <https://plato.stanford.edu/entries/aristotle-rhetoric/>
59. Fisher WR. *Human Communication as Narration: Toward a Philosophy of Reason, Value, and Action*. University of South Carolina; 1987.
60. Majone G. *Evidence, Argument, and Persuasion in the Policy Process*. Yale University Press; 1989.
61. Perelman C. *The Realm of Rhetoric*. University of Notre Dame Press; 1982.
62. Turner V. Social dramas and stories about them. *Crit Inq*. 1980;7(1):141-168.

63. Derrida J. Declarations of independence. *New Political Sci.* 1986;7(1):7-15.
64. Kristeva J. Word, dialogue, and novel. In: Roudiez LS, ed; Gora T, Jardine A, Roudiez LS, trans-eds. *Desire in Language: A Semiotic Approach to Literature and Art.* Columbia University Press; 1980.
65. Mouffe C. *The Return of the Political.* Verso; 1993.
66. Mouffe C. *Agonistics: Thinking the World Politically.* Verso; 2013.
67. Foucault M. *Power/Knowledge. Selected Interviews & Other Writings 1972–1977.* Pantheon Books; 1980.
68. Sampath B, Rakover J, Baldoza K, Mate K, Lenoci-Edwards J, Barker P. *Whole-System Quality: A Unified Approach to Building Responsive, Resilient Health Care Systems.* Institute for Healthcare Improvement; 2021.
69. Committee on Quality of Health Care in America, Institute of Medicine. *Crossing the Quality Chasm: A New Health System for the 21st Century.* National Academy Press; 2001.
70. Argyris C. *Organizational Learning.* Blackwells; 1999.
71. Nordin AMM, Andersson Gäre B, Andersson AC. Prospective sensemaking of a national quality register in health care and elderly care. *Leadersh Health Serv (Bradf Engl).* 2018;31(4):398-408. <https://doi.org/10.1108/lhs-03-2017-0012>
72. Andersson-Gäre B, Neuhauser D. The health care quality journey of Jönköping County Council, Sweden. *Qual Manag Health Care.* 2007;16(1):2-9.
73. Ärleskog C, Vackerberg N, Andersson A-C. Balancing power in co-production: introducing a reflection model. *Humanit Soc Sci Commun.* 2021;8(1):1-7.
74. Brown BC. Leading complex change with post-conventional consciousness. *J Organ Chang Manag.* 2012;25(4):560-575.
75. Kjellström S, Andersson A-C. Applying adult development theories to improvement science. *Int J Health Care Qual Assur.* 2017;30(7):617-627.
76. Ostrom E. *Governing the Commons: The Evolution of Institutions for Collective Action.* Cambridge University Press; 1990.
77. Deegan MJ. *Jane Addams & the Men of the Chicago School 1892–1918.* Routledge; 1990.
78. Cutchin M. Habits of social inquiry and reconstruction: a Deweyan vision of democracy and social research. In: Wills J, Lake R, eds. *The Power of Pragmatism: Knowledge Production and Social Inquiry.* Manchester University Press; 2020.
79. Cook SN, Wagenaar H. Navigating the eternally unfolding present: toward an epistemology of practice. *Am Rev Public Adm.* 2012;42(1):3-38.

80. Healey P. The pragmatic tradition in planning thought. *J Plan Educ Res*. 2009;28(3):277-292.
81. Freire P. *Education for Critical Consciousness*. Bloomsbury Publishing; 1970.
82. Mol A. *The Body Multiple. Ontology in Medical Practice*. Duke University Press; 2002.
83. Puig de la Bellacasa M. *Matters of Care. Speculative Ethics in More than Human Worlds*. University of Minnesota Press; 2017.
84. Fricker M. *Epistemic Injustice: Power and the Ethics of Knowing*. Oxford University Press Oxford; 2007.
85. Bijker W, Bal R, Hendriks R. *Paradox of Scientific Authority. The Role of Scientific Advice in Democracies*. MIT Press; 2009.
86. Engebretsen E, Henrichsen GF, Ødemark J. Towards a translational medical humanities: introducing the cultural crossings of care. *Med Humanit*. 2020;46(2):e2.
87. Weick KE. *Sensemaking in Organizations*. Sage; 1995.
88. Engebretsen E, Baker M. *Rethinking Evidence in the Time of Pandemics: Scientific vs Narrative Rationality and Medical Knowledge Practices*. Cambridge University Press; 2022.
89. Lawlor L, Jacques Derrida, Zalta EN, Nodelman U, eds. Stanford Encyclopedia of Philosophy. 2021. Accessed May 5, 2023. <https://plato.stanford.edu/entries/derrida/>
90. Derrida J. *Differance in Speech and Phenomena and Other Essays on Husserl's Theory of Signs*. Allison DB, trans-edl. Northwestern University Press; 1973.
91. Edmondson AC, Lei Z. Psychological safety: the history, renaissance, and future of an interpersonal construct. *Annu Rev Organ Psychol Organ Behav*. 2014;1(1):23-43.
92. Jagosh J, Bush PL, Salsberg J, et al. A realist evaluation of community-based participatory research: partnership synergy, trust building and related ripple effects. *BMC Public Health*. 2015;15:725. <https://doi.org/10.1186/s12889-015-1949-1>
93. Karakulak Ö, Stadtler L. Working with complexity in the context of the united nations sustainable development goals: a case study of global health partnerships. *J Bus Ethics*. 2022;180:997-1018.
94. Craig P, Dieppe P, Macintyre S, Michie S, Nazareth I, Petticrew M. Developing and evaluating complex interventions: the new Medical Research Council guidance. *Int J Nurs Stud*. 2013;50(5):587-592.
95. Papoutsis C, Wherton J, Shaw S, Morrison C, Greenhalgh T. Putting the social back into sociotechnical: case studies of co-design in digital health. *J Am Med Inform Assoc*. 2021;28(2):284-293. <https://doi.org/10.1093/jamia/ocaa197>

96. Spivak GC. Can the subaltern speak? *Die Philosophin*. 1988;14(27):42-58.
97. Juritzen TI, Engebretsen E, Heggen K. Subject to empowerment: the constitution of power in an educational program for health professionals. *Med Health Care Philos*. 2013;16(3):443-455.
98. Hardy C, Clegg SR. Some dare call it power. In: Clegg SR, Hardy C, Lawrence TB, Nord WR, eds. *The SAGE Handbook of Organization Studies*. SAGE Publications; 2006:754-775.
99. Foucault M. *Security, Territory, Population: Lectures at the Collège de France, 1977-78*. Springer; 2007.
100. Marten R, Hanefeld J, Smith R. Commission on global governance for health: what about power. *Lancet*. 2014;383(9936):2207.
101. Askheim C, Heggen K, Engebretsen E. Politics and power in global health: the constituting role of conflicts: comment on "Navigating between stealth advocacy and unconscious dogmatism: the challenge of researching the norms, politics and power of global health". *Int J Health Policy Manag*. 2015;5(2):117-119.
102. Janes JE. Democratic encounters? Epistemic privilege, power, and community-based participatory action research. *Action Res (Lond)*. 2016;14(1):72-87.
103. Ødemark J, Engebretsen E. Challenging medical knowledge translation: convergence and divergence of translation across epistemic and cultural boundaries. *Humanit Soc Sci Commun*. 2022;9(1):1-7.
104. Kok J, de Kam D, Leistikow I, Bal R. Epistemic injustice in incident investigations: a qualitative study. *Health Care Anal*. 2022;30(3-4):254-274. <https://doi.org/10.1007/s10728-022-00447-3>
105. Oldenhof L, Wehrens R, Bal R. Dealing with conflicting values in policy experiments: a new pragmatist approach. *Adm Soc*. 2022;54(9):1736-1766.
106. Leonard-Barton D, Swap WC. *When Sparks Fly: Igniting Creativity in Groups*. Harvard Business Press; 1999.
107. Stone DA. *Policy Paradox: The Art of Political Decision Making*. Vol 13. W. W. Norton & Company; 1997.
108. Rhodes T, Lancaster K. Evidence-making interventions in health: a conceptual framing. *Soc Sci Med*. 2019;238:112488.
109. Latour B, Woolgar S. *Laboratory Life: The Construction of Scientific Facts*. Princeton University Press; 2013.
110. Shön D, Rein M. *Frame Reflection: Toward the Resolution of Intractable Policy Controversies*. Basic Books; 1994.
111. Woolgar S. Configuring the user: the case of usability trials. *Sociol Rev*. 1990;38(1):58-99.

112. Hanseth O, Monteiro E. Inscribing behaviour in information infrastructure standards. *Account Manag Inf Technol*. 1997;7(4):183-211.
113. Bowker GC, Timmermans S, Star SL. Infrastructure and organizational transformation: classifying nurses' work. In: Orlikowski WJ, Walsham G, Jones MR, Degross JI, eds. *Information Technology and Changes in Organizational Work*. Springer; 1996:344-370.
114. Husain L, Greenhalgh T, Hughes G, Finlay T, Wherton J. Desperately seeking intersectionality in digital health disparity research: narrative review to inform a richer theorization of multiple disadvantage. *J Med Internet Res*. 2022;24(12):e42358. <https://doi.org/10.2196/42358>
115. Essén A, Oborn E. The performativity of numbers in illness management: the case of Swedish Rheumatology. *Soc Sci Med*. 2017;184:134-143.
116. Adams V. *Metrics: What Counts in Global Health*. Duke University Press; 2016.
117. Power M. *The Audit Society: Rituals of Verification*. Oxford University Press; 1997.
118. Fukuda-Parr S. Global goals as a policy tool: intended and unintended consequences. *J Human Dev Capabil*. 2014;15(2-3):118-131.
119. Wallenburg I, Quartz J, Bal R. Making hospitals governable. Performativity and institutional work in ranking practices. *Adm Soc*. 2019;51(4):637-663. <https://doi.org/10.1177/0095399716680054>
120. Dennis A. Pragmatism and symbolic interactionism. In: Jarvie IC, Zamora-Bonilla J, eds. *The Sage Handbook of the Philosophy of Social Sciences*. SAGE Publications; 2011:463-474.
121. Behr L, Grit K, Bal R, Robben P. Framing and re-framing critical incidents in hospitals. *Health Risk Soc*. 2015;17(1):81-97. <https://doi.org/10.1080/13698575.2015.1006587>
122. Cousins B. Design thinking: organizational learning in VUCA environments. *Acad Strateg Manag J*. 2018;17(2):1-18.
123. Han PKJ. *Uncertainty in Medicine: A Framework for Tolerance*. Oxford University Press; 2021.
124. Contandriopoulos D, Lemire M, Denis JL, Tremblay É. Knowledge exchange processes in organizations and policy arenas: a narrative systematic review of the literature. *Milbank Q*. 2010;88(4):444-483.
125. Davies C, Wetherell M, Barnett E. *Citizens at the Centre: Deliberative Participation in Healthcare Decisions*. Policy Press; 2006.
126. Heerings M, van de Bovenkamp H, Cardol M, Bal R. Tinkering as collective practice: a qualitative study on handling ethical

- tensions in supporting people with intellectual or psychiatric disabilities. *Ethics Soc Welf.* 2022;16(1):36-53.
127. ASHRAE Epidemic Task Force. Core recommendations for reducing airborne infectious aerosol exposure. American Society of Heating, Refrigeration, and Air-Conditioning Engineers. October 19, 2021. Accessed February 3, 2022. <https://tinyurl.com/2m9bmd7>
 128. Wells WF. On air-borne infection. Study II. Droplets and droplet nuclei. *Am J Hyg.* 1934;20(3):611-618.
 129. Morawska L, Milton DK. It is time to address airborne transmission of coronavirus disease 2019 (COVID-19). *Clin Infect Dis.* 2020;71(9):2311-2313.
 130. Sachs JD, Karim SSA, Akinin L, et al. The Lancet Commission on lessons for the future from the COVID-19 pandemic. *Lancet.* 2022;400(10359):1224-1280.
 131. Cribb A. *Healthcare in Transition: Understanding Key Ideas and Tensions in Contemporary Health Policy.* Policy Press; 2017.
 132. Cribb A, Entwistle V, Mitchell P. Talking it better: conversations and normative complexity in healthcare improvement. *Med Humanit.* 2022;48(1):85-93.
 133. Donetto S, Tsianakas V, Robert G. Using Experience-based Co-design (EBCD) to improve the quality of healthcare: mapping where we are now and establishing future directions. *King's College London.* 2014:5-7.
 134. Goodrich J. Supporting hospital staff to provide compassionate care: do Schwartz Center Rounds work in English hospitals? *J R Soc Med.* 2012;105(3):117-122.
 135. Maben J, Taylor C, Dawson J, et al. A realist informed mixed-methods evaluation of Schwartz Center Rounds® in England. *Health Serv Deliv Res.* 2018.
 136. Bannink D, Trommel W. Intelligent modes of imperfect governance. *Policy Soc.* 2019;38(2):198-217.
 137. Rosenhead J, Franco LA, Grint K, Friedland B. Complexity theory and leadership practice: a review, a critique, and some recommendations. *Leadersh Q.* 2019;30(5):101304.

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