

## COMMENTARY

Person-Centered Healthcare



# Changing the paradigm of research

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## KEYWORDS

complex adaptive systems, health system redesign, paradigm shift, patient-centeredness, somato-psycho-socio-semiotic model of health, "top-down"—"bottom-up" causation

Patient-orientation is necessary but not sufficient to create a *better way* of health care delivery, or *better approaches* to health and health systems research. I agree with Turcotte et al.<sup>1</sup> that sciences fall into the two categories of 'royal and minor (nomad)' which indeed stifles knowledge generation. Knowledge generation under the royal banner besides of being linear is also self-referential—it fails to understand that knowledge itself is complex,<sup>2–10</sup> and that new knowledge will only ever augment, and at times reject, parts of the contemporary 'known'. As they—rightly—highlight, nomad science acts as a kind of counterculture challenging on the one hand the prevailing way of academic and popular thinking, and on the other aiming to disrupt stifled research agendas controlled by financial vested interests. As the 'patient-oriented research paradigm' is a 'state sanctioned' enterprise, there is indeed a real risk of simply pushing the 'patient-oriented agenda' as if they were the emperor's new clothes.

However, I feel that Turcotte et al.'s<sup>1</sup> critique arises from within the prevailing reductionist paradigm—'*patient-oriented research should not be modelled on the evidence-based movement*'—and thereby falls short of addressing the real failings of better understanding health, health care and health research—namely clearly emphasising the *complex adaptive* nature of health, health care and healing at the micro-,<sup>11–15</sup> and health systems organisation at the macro-level.<sup>16</sup> I am not denying the achievements of past endeavours, rather, I make the point that these approaches are no longer the way forward to address our contemporary challenges. Truly approaching these new challenges requires the courage to leave the old—reductionist—paradigm focused on knowledge generation about parts (*knowing what*<sup>3</sup>) and embrace with vigour and rigor a new—complex

adaptive—paradigm focused on achieving the deep understanding about how the parts work together (*knowing how*<sup>3</sup>). This is the pre-requisite to realise the dream of *Health for All*<sup>17</sup> through a truly effective, efficient and equitable health system.<sup>16</sup>

## 1 | REDUCTIONISM—KNOWING THE PARTS

Moving forward requires and understanding of the past. The history of healthcare started with the notion of balance and adaptability in ancient times—the balance of the four humours—which dominated healthcare under the Galen paradigm until the middle of the 17th century.<sup>18</sup>

However, the transition—as all transitions do<sup>2</sup>—to a 'parts approach' already started well before the abandonment of Galen's paradigm. In the 16th century Leonardo DaVinci provided the first accurate anatomical description of the human body, while in the early 17th century Morgagni first described the anatomical changes encountered in various diseases.<sup>18</sup> During that period Newton 'discovered the laws of the physical world' which led to the justification of the 'scientific method' with its key emphasis on 'observations and repeatable experiments'. In the words of Banatar et al: '*The underlying epistemological framework centres on abstract thinking, objectivity in observation, logical reasoning processes, verifiable knowledge ...*'.<sup>19</sup>

While critical about reductionism one also clearly has to acknowledge that this approach to knowledge generation has greatly contributed to

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medical [and other] progress. It must, however, be emphasised that it mostly resulted in knowledge about the *structure* and *isolated function* of parts—ranging from the microscopic level of organelles and cell to the macroscopic level of organs and organ systems.

Newton's mechanistic (or clockwork) worldview of *cause and effect* well and truly persists in medical research in the form of the randomised controlled trial—a key assumption of this approach entails that the characteristics of the subjects in each arm of a trial are *the same* (even though they are not, see next section), allowing to 'ascribe to the intervention' all observed differences.

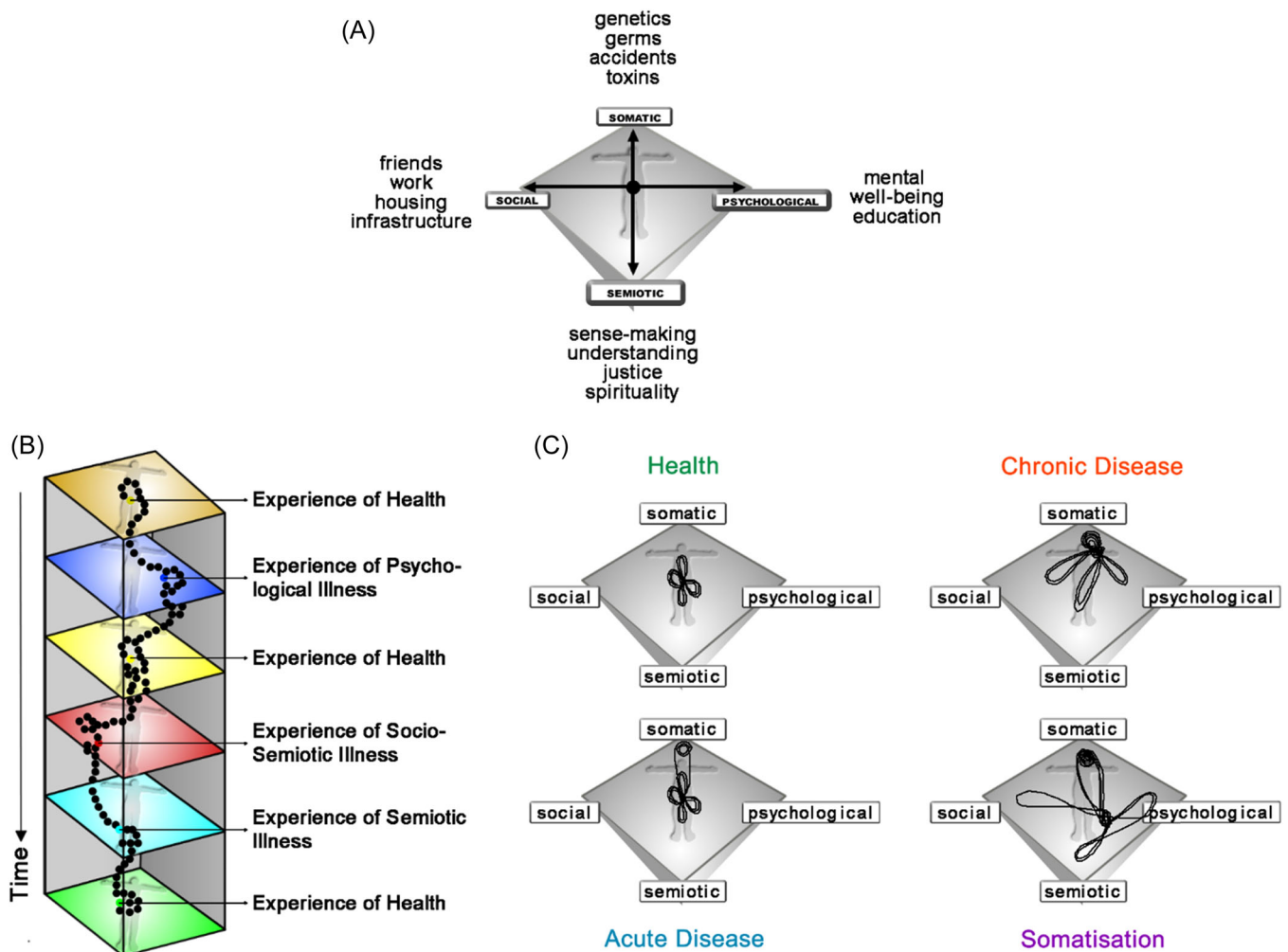
## 2 | COMPLEXITY—UNDERSTANDING THE WHOLE

Already at the end of the 18th century it became clear that the mechanistic paradigm did not apply to 'the living world'. While Goethe noted the differences between mechanical and organic

systems—in the former the parts shape the whole, in the latter the whole shapes the parts—it was Alexander von Humboldt who realised the critical distinction—in nature everything is connected to everything else, hence it is essential to examine the differences and similarities *without losing sight of the whole*.<sup>20</sup> The area of complexity studies—or the study of interconnectedness and interdependencies—had emerged, a nomad science that still struggles to gain its rightful place in the domains of the '*study of the living world*'.

To paraphrase Osler: the central concern of medicine is the *person who has the disease*, rather than the disease itself—he reinforced Humboldt's call to not *lose sight of the whole* (and thereby became a member of the club of the nomad scientists). Osler also alluded to the problematic 'nature of disease', namely that it is more a 'kind of classification' rather than the precise definition of a 'unique entity'.<sup>2,9,18</sup> Diseases are socially constructed entities,<sup>21–23</sup> temporal in nature<sup>24</sup> as well as tools of social and political control.<sup>25</sup>

McWhinney<sup>26</sup> alluded to the common confusion between disease and diagnosis—while *diseases* are complex in nature, *diagnosis*



**FIGURE 1** The somato-psycho-socio-semiotic (SPSS) model of health and its dynamics over time. (A) The relationship between somatic, emotional, social and sense-making domains defines the balanced state of 'health experience'. (B) Health experiences change constantly depending on which one of the four domains is disturbed. (C) Plotting the changing health experiences into a 'phase space diagram' reveals the patterns of common disease presentations.

are socially constructed based on an abstraction from 'a number of particular entities or events [that] things ... have in common'. He highlighted that abstractions, while powerful, have significant disadvantages. He wrote: "The disadvantage of exclusive attention to a group of abstractions," wrote A.N. Whitehead, " ... is that by the nature of things you have abstracted from the remainder of things. Insofar as the excluded things are important in your experience, your modes of thought are not fitted to deal with them."<sup>2</sup> The "excluded things" are the context from which we have abstracted our generalization, and if the context is crucial, as it is in family medicine, the generalization may strike us as meaningless.'

Osler and McWhinney both embraced the notion of patient-orientation as essential to the medical endeavour, and both realised the contextual nature of disease as distinct from the decontextualised nature of the diagnosis. For both, the key concern of the medical encounter was to gain an understanding of the whole, understanding this patient's disease in his particular context. For them patient-orientation meant an engagement *with* the patient for the benefit of the patient.

The complex dynamic nature of health has been previously outlined elsewhere and is summarised in Figure 1.<sup>11,12</sup> The key point here is that health is a personal and adaptive state arising from interactions between ones somatic, emotional, social and sense-making domains (SPSS-model of health)—the presence or absence of a good health experience can emerge as much in the presence as absence of 'identifiable disease' or a 'vaguely defined diagnosis'.

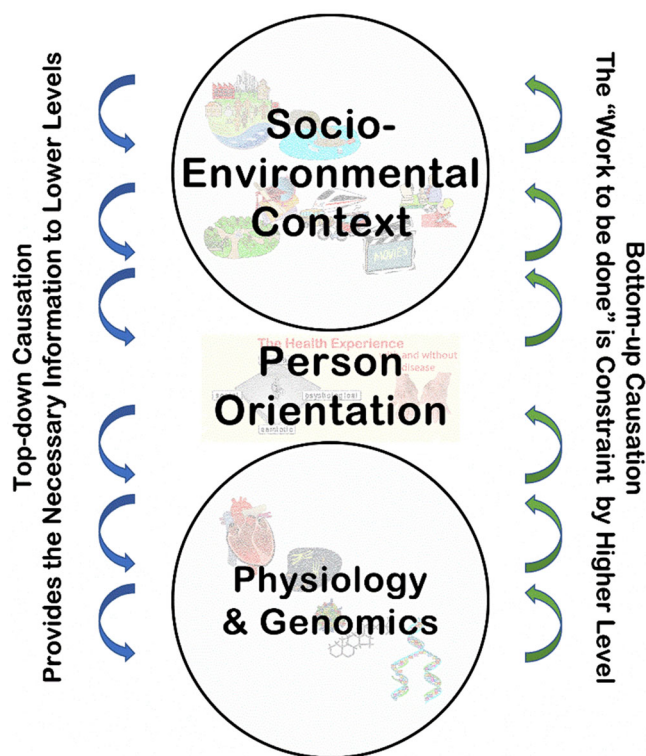
### 3 | A CALL TO EMBRACE A COMPLEXITY PARADIGM FOR HEALTH CARE DELIVERY, HEALTH SYSTEM ORGANISATION AND HEALTH RESEARCH

Turcotte et al.'s<sup>1</sup> call for change should have gone much further and have embraced Max Planck's challenge: 'If you change the way you look at things, things you look at change'. If one looks through a complexity lens at patient-orientation one would indeed see that things change, and change dramatically.<sup>27</sup>

A systemic picture of patient-orientation in health care has the patient at its centre, 'sandwiched' between the contextual domains of the macro-level socio-environmental and the detailed domains of the micro/nano-level of physiology and genomics.<sup>15,28</sup> Again, the details have been described elsewhere and are summarised in Figure 2.

The call to embrace a complexity frame for health, health care and health systems [and indeed more generally] is really a call to shift the paradigm.<sup>30</sup> As Whitehead pointed out, in a new frame 'old paradigm' questions like Turcotte et al.'s<sup>1</sup> about the role of patient-orientation as 'royal versus nomad' science are irrelevant and no longer make sense.<sup>2</sup>

What then? I suggest two key new paradigm questions that could refocus our research efforts: What are the interactions, and how do they dynamically work together, between the patient's environmental



**FIGURE 2** Patient-orientation—seen through a complex adaptive system lens. Complex adaptive systems exhibit a hierarchical layered structure, where higher layers (e.g., health policy) provide contextual constraints that limit the emergent possibilities inherent in lower levels (e.g., health care delivery in a disadvantaged setting), i.e., complex adaptive systems entail "top-down" and "bottom-up" causation.<sup>29</sup> While "top-down" constraints limit bottom-up emergent behaviour, emergent "bottom-up" outcomes reshape top-down constraints. Patient-orientation, understood in a complex adaptive system framework, is sandwiched between the top-down forces of the socio-ecological context of the patient and his inherent biological (genomic and physiological) blueprint.

circumstances, his health professionals, his disease(s) and his understandings about the lot? and: How do health professionals best respond to the interdependencies and dynamics [and thereby idiosyncrasies] of each patient's unique illness presentation, i.e., balancing the somatic, social, emotional and sense-making needs to achieve 'best possible' health outcomes? Approaching the question of patient-orientation from within a complexity frame allows us to see patient-orientation in a—pragmatically different—way<sup>27</sup> that enables us to ultimately achieve significantly better 'patient-oriented outcomes'.

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#### CONFLICT OF INTEREST STATEMENT

The author declares no conflict of interest.

## DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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