

Environmental sustainability and management theory development: Post-paradigm insights from the Anthropocene

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Abstract

Given a looming crisis of environmental degradation, this conceptual review revisits certain long-standing assumptions informing the development of management theory. Specifically, we problematise seminal notions of paradigm differentiation at the heart of Burrell and Morgan's theory of paradigms by arguing that assumptions of paradigm incommensurability amount to abdication of a responsibility to consider cross-cutting existential imperatives. In developing the concept of epistemological panarchy, we build on some ideas of stakeholder theory to suggest a research agenda concerned with developing an improved meta-epistemology aligned with concerns of environmental sustainability.

KEYWORDS

Anthropocene, environmental sustainability, management theory development, panarchy, post-paradigm thinking

INTRODUCTION

Evidence suggests a 'perfect storm' of converging environmental threats associated with the 'Anthropocene epoch' (the age of the human) (Crutzen & Stoermer, 2000; Verburg et al., 2015). This epoch represents the consequences of a persistent failure to address what have now become existential environmental threats. In this paper, we consider contributions of management theory and practice to this ongoing failure. We approach this by revisiting certain long-standing core assumptions informing the development of management theory. Specifically, we problematise the seminal notion of paradigm differentiation at the heart of Burrell & Morgan's (1979) theory of paradigms by arguing that assumptions of paradigm incommensurability amount to abdication of a responsibility to consider cross-cutting existential imperatives in management research paradigms.

As an alternative, we propose a research agenda for management theory development that is sensitive to the role of management in its failure to systematically address ecological and other existential threats. Our contribution to this agenda is as follows.

First, considering the need to develop theoretical responses to the climate change imperative, we draw on Anthropocene and resilience research (see Ceballos et al., 2015; Mitchell, 2019; Mitchell et al., 2020) and link it with literature on theory development to augment certain ideas of Burrell & Morgan (1979). We extend recent studies exploring the research-practice divide in sustainable development (SD) (Easter et al., 2021) and the need for robust theoretical foundations to support SD and social innovation (Periac et al., 2018). More specifically, we question certain core assumptions about theory development itself, by revisiting Burrell and Morgan's (1979) seminal typology, supplementing their theoretical model to explicitly incorporate environmental implications of management theory development.

We hereby seek to reconceptualise key assumptions of theory making to incorporate an environmental sensitivity in the theory development process, so that by revisiting theory about theory development, at its 'source', such embedding becomes standardised.

Second, in developing the concept of epistemological panarchy, we build on some ideas of stakeholder theory that explain the capacity to diversify sources of external

influence on corporations to behave sustainably (Bonnafous-Boucher & Porcher, 2010).

Collective action at organisational level is increasingly needed to address challenges of SD (Berkowitz & Dumez, 2016). A great deal of work has focused on improving sustainability thinking and practice (Murphy et al., 2020) through research on diverse organisational topics including unethical leadership (Ruiz-Palomino et al., 2021), emergent responsible leadership (Meliou et al., 2021), values, beliefs and attitudes (Stokes et al., 2016), receptivity to sustainability policies (Manika et al., 2021), CEO norms (Papagiannakis & Lioukas, 2018), pro-environmental psychological behaviour (Lülfes & Hahn, 2013) and sustainable human resource management practices (Jerónimo et al., 2020). Nevertheless, knowledge about embedding sustainability at the heart of organisational thinking remains underdeveloped in the tenets of long-standing theory taught to business and management students.

Given slow progress toward averting what is becoming an existential environmental crisis (Ceballos et al., 2015; Mitchell, 2019; Mitchell et al., 2020), other avenues to address this threat to date seem limited. For example, regulatory coercion increases environmental responsiveness of organisations, but only up to a point (Eiadat & Fernández Castro, 2018). Antecedents and conditions need to be created to trigger emergence of good environmental practices (Murphy et al., 2020). Therefore, on account of damage human behaviour has exacted on our environmental resources (Crutzen & Stoermer, 2000; Novacek & Cleland, 2001; Verburg et al., 2015), we suggest that *our thinking about our thinking*, our meta-epistemology underpinning business ethics theory development, should be revisited. We revisit certain of Burrell and Morgan's (1979) conceptions in light of the heuristic framework of 'panarchy', particularly its notion of nested systems, to obtain insights into these multiple systems with which we are engaged. An important contributor to this current crisis has arguably been management theory and its conceptual underpinnings that have shaped the behaviours of corporate enterprises over time. For example, rational utility maximisation and other concepts with 'extractive' consequences, although originating in other fields, have formed the basis of management and business behaviour. This has occurred through the mediating effect of the scholarly theory development process itself and its schooling of the global executive corporate cohort and those involved in all stripes of enterprise.

Our work therefore contributes to the business ethics literature by interrogating some fundamental assumptions of management theory with a view to augment these with panarchic insights. In so doing, we hope to provoke novel ideas for management theory development that contribute to an improved meta-epistemology more aligned with, and less disruptive to, nested ecological and social systems. These insights may be provisionally

translated into propositions for business managers who are operating under conditions of complexity and uncertainty and who are faced with the ethical conundrum brought forth by the emergence of the Anthropocene epoch.

METHODOLOGICAL APPROACH

The paper applies a conceptual review methodology. As such, literature was sourced to contextualise and ground argumentation and to extend and build on theoretical ideas in the relevant domain. With little debate about the actuality of the Anthropocene as such, we pursue a conventional narrative approach to our conceptual review, to identify and then synthesise key concepts to agglutinate a body of work upon which to build and extend the seminal paradigm developed by Burrell and Morgan (1979). Their work was developed when concern about 'the environment' was more muted than it is today. We suggest the environmental imperative should be factored into this amended paradigm at front and centre, necessitating a reimagining of our theoretical *modus vivendi* given this crisis that threatens our existential fabric. A narrative conceptual review methodology therefore advances our objective here, which is to provoke novel thinking about our thinking—our meta—epistemology, in extending Burrell and Morgan's (1979) meta-epistemological ideas.

THE ENVIRONMENTAL CRISIS

Considering anthropogenic impacts, some reconsider the utility of concepts such as sustainability in favour of a renewed emphasis on adaptation and radical changes to economic infrastructures and our *modus vivendi*—our way of living, our fundamental way of life (Benson & Craig, 2014; Dumanoski, 2009; Foster, 2015). Despite efforts associated with the United Nations (UN) Sustainable Development Goals (SDGs), progress remains slow. Although definitions of terms such as SD, sustainability and corporate social responsibility (CSR) are contested, there is some consensus that they are useful umbrella constructs that reconcile diverse aims (Fonseca, 2015). The UN World Commission on Environment and Development's Brundtland Report defines SD as meeting 'the needs of the present without compromising the ability of future generations to meet their own needs' (Brundtland, 1987, p. 15). Corporate performance has increasingly been held to account against a triple bottom line of social justice, economic prosperity and environmental quality (Elkington & Rowlands, 1999), which some suggest should be augmented to include happiness (Fonseca, 2015).

The 1992 UN Conference on Environment and Development, or 'Earth Summit' in Rio de Janeiro,

extended work on SD to develop the Rio Declaration, UN Framework Convention on Climate Change, Convention on Biological Diversity, Declaration on the principles of forest management and the Commission on Sustainable Development (United Nations, 2022). By 2015, the UN General Assembly ratified 17 SDGs, adopting the 2030 Agenda for Sustainable Development (Fonseca et al., 2020) to address uncompleted aspects of the Millennium Development Goals (United Nations, 2015, p. 3). To date, however, these developments have yet to yield the large-scale behavioural change required to reverse the environmental crisis.

DIAGNOSING THE PROBLEM: CONSEQUENCES OF LINEAL EPISTEMOLOGIES

The perfect storm of the Anthropocene reflects a confluence of certain trends.¹ These include climate change, human precipitation of a sixth biological mass extinction event (Ceballos et al., 2015; Novacek & Cleland, 2001), a transgression of planetary processes to exceed a safe operating space (Rockström et al., 2009) and significant changes to land cover biomes and hydrological systems (Nilsson et al., 2005).

At this nexus, we advance our polemic, adopting logics of the Anthropocene literature to question certain long-standing assumptions about the theory development process. In so doing, we provoke new thinking about how theory development can better incorporate ecological sensitivity. We build on Mitchell et al.'s (2020) ideas here that 'lineal' epistemologies are failing to provide management with the knowledge tools necessary to deal with complexity of interrelationships between business and its ecological systems. Organisations are at the heart of multilevel causal influences and cross-level interactions and microlevel processes of social systems sensitive to external influences (Bitektine & Haack, 2015). Material phenomena also interact with human institutions, the rules and conventions governing human thoughts, intentions and behaviours (Cornelissen et al., 2015).

For Mitchell et al. (2020), the Anthropocene represents a multi-dimensional limit point, suggesting a fundamental constraint to lineal epistemologies typically used to frame management strategy. Lineal epistemologies fail to explicitly incorporate multiple equilibria states, such that threshold change conditions tend to perpetuate management strategies lacking in flexibility and resilience. This perspective suggests some important implications for management. Locating business and economic turbulence associated with environmental degradation in

relation to notions of 'panarchy [hierarchical cross-scale effects in a set of adaptive cycles at different scales] of a nested hierarchy of system scales' may ultimately make uncertainties associated with systems dynamics intelligible (Mitchell et al., 2020). Thus, panarchy is a useful concept, providing a focus on nested hierarchies and the scale relationships that businesses behaviour can influence. Given insufficient attention paid to levels and cross-level interactions in the organisational literature (Bitektine & Haack, 2015), the current paper interrogates and applies these ideas to management theory development, with specific reference to notions of paradigm incommensurability.

PANARCHY AND THE NEED TO CONSIDER THE IMPLICATIONS OF MANAGEMENT THEORY AND PRACTICE

Drawing inspiration from Bateson's (1972) observation that the unit of survival is the organism plus (i.e., together *with*) its environment, business managers are encouraged to distinguish their focal systems of interest in ethical ways that expand their epistemological gestalt. Assemblage theory (DeLanda, 2016; Deleuze & Guattari, 1987) and recent findings in resilience and social-ecological systems studies suggest the heuristic of panarchy as a hierarchy of nested systems can help business managers and strategists think in terms of larger and smaller scale systems and in terms of faster and slower moving variables.

Such thinking may be useful if it encourages managers to consider multiple perspectives, emergent phenomena and non-linear causality. This is the ontological-epistemological analogue of the information environment of 'Big Data' within which modern businesses are immersed. Systems-oriented application of Anthropocene logics to the science of management and associated criticism of linear models of understanding phenomena (Mitchell et al., 2020) seem to echo developments in big data analytics offering comprehensive insights into system-wide effects. Accordingly, some have argued a 'new paradigm' enabled by big data analytics may herald a new era in epistemological theory development (Kitchin, 2014) and the potential for real time substantial predictive and explanatory power in research (Hilbert et al., 2009). Ontological and epistemological implications arise from a consideration of these opportunities that conflict with long-standing notions of paradigm incommensurability. These developments in big data therefore echo criticisms of linear models of abstraction, and their ontological and epistemological limitations (Mitchell et al., 2020), in that these new modes of theorising transcend linear perspectives, or a focus on phenomena that do not take their systemic scale effects into account.

¹More detailed review of Anthropocene literature is beyond the scope here, but a reader is referred to Biermann (2014) for an insightful review.

ONTOLOGY AND EPISTEMOLOGY: BURRELL AND MORGAN REVISITED

In seeking to further develop ontological and epistemological logics from consideration of the Anthropocene, it is first necessary to set the stage for analysis. The ontological and epistemological framework suggested by Burrell and Morgan (1979) frames the analysis that follows. Certain limitations associated with this seminal theoretical framework are identified, and the original model is used as the basis for the development of a contemporary model to *incorporate certain forces acting on hierarchies of nested systems*. In so doing, we explore dynamics experienced by organisations at the nexus of multidirectional economic and business forces within a global social-environmental ecosystem.

Drawing from principles of second-order cybernetics (Mitchell, 2019; von Foerster, 2014), we suggest that implications arise from how assumptions, overt or not, underlie the research practice of researchers. According to Burrell and Morgan (1979, p. 1), all 'social scientists approach their subject via explicit or implicit assumptions about the nature of the social world and the way in which it may be investigated'. They suggest these include the following: (i) ontological assumptions relating to the 'very essence of the phenomena under investigation' (p. 1) such as whether 'reality' is external to an individual or a product of individual consciousness; (ii) epistemological assumptions, or those relating to the grounds of knowledge, its forms (tangibility) and how 'truth' of knowledge can be established, and its objective versus subjective nature; (iii) and assumptions concerning human nature and the environment, as well as issues of determinism versus voluntarism, or the extent to which destiny is determined by external forces or internal will.

Previous work seeking to develop ontological insights for ecocentric theory development in the Anthropocene highlights the importance of ontology, in that human perceptions of objects and their relations 'will influence the way things are (and will be) organised' (Heikkurinen et al., 2016, p. 706). Ecocentric approaches to ontological, epistemological and axiological thinking (Shrivastava, 1994; Starik, 1995) extend philosophical approaches beyond organisational studies that 'reproduce the anthropocentric and antirealist philosophical tradition of science, as the human experience is favoured at the expense of the non-human world' (Heikkurinen et al., 2016, p. 705). The conceptual framework, or heuristic offered by panarchy (Mitchell et al., 2020), transcends anthropocentric ontological, epistemological and values-based assumptions. Accordingly, it suggests that human development and its societal infrastructural interactions manifest complex, non-linear and cross-scalar influences and that attempts to account for these using linear conceptions can be limiting. Assumptions about the social, and indeed natural, world failing to consider the panarchic nature of systems might therefore be at

odds with certain fundamental characteristics of complex dynamic systems. Human beliefs and assumptions are reinforced by group dynamics, including the constitutive power of knowledge and expertise of groups (Foucault, 1977), which typically concretise as values. These values form the foundations of cultural dynamics and discourse, which are in turn taken for granted, often becoming beyond reproach within groups.

Academic cultures forming around assumptions of social scientific endeavour share characteristics with other contexts of cultural value formation, through which human values shape and construct perceived realities (Foucault, 1977). Given an impending disaster associated with the Anthropocene, we suggest a critical re-evaluation of the Burrell and Morgan (1979) schema. While others have argued an ecological paradigm needs to move from the periphery of organisational and managerial thinking to its centre (Heikkurinen et al., 2016), we take this argument further by advocating that we locate this awareness at the heart of one of the most influential theories of paradigms of social science. If we are to change a system, as Meadows (2009) argued, then the point at which the most leverage is exerted is at the level of one's paradigm. In advocating this shift, we also suggest that such a re-evaluation may benefit from linking heuristic notions of panarchy to some ontological and epistemological principles, to offer an augmented schema.

According to Burrell and Morgan (1979, p. 17), assumptions underlying social science research can be differentiated according to two axes. According to the *first axis*, social scientific research either (i) focuses on explaining the status quo, or 'explanations of society in terms which emphasise its underlying unity and cohesiveness' or (ii) can take the form of a 'sociology of radical change', seeking explanations for 'radical change, deep seated structural conflict, modes of domination and structural contradiction' characterising modern society. The latter essentially concerns needs for human emancipation from structures stunting developmental potential.

Burrell and Morgan's first axis therefore incorporates important tensions between radical and disruptive innovations and forces resisting them. Clear and present dangers seemingly arise, however, from disjunctures between organisational behaviours and their consequences (highlighted by Anthropocene discourse). Constraints to innovative responses to potential crises may need to be disrupted to ensure critical thought. This disruption might take the form of cross-linkages across these axes and might entail a substantial reorientation toward ethical principles that transcend managerial imperatives and their related economic rationales. Constraints to theory development caused by paradigmatic blinders might to some extent be responsible for the climate crisis, since successive cohorts of managers have for a long time now relied on management theory to guide their actions.

There has been a recent trend toward implementing something similar to the holistic characteristics of panarchy. The management community has advanced holistic business models to incorporate organisation ecosystems, sustainability, SDGs and digital transformation, an example being the European Foundation for Quality Management (EFQM) 2020 model (Fonseca et al., 2021). Nevertheless, much thinking in business remains influenced by long-standing theory that guides theorising and novel practice. Theoretical ideas may need to increasingly become accountable to the panarchic reality of interacting complex nested systems that characterise real world forces acting on the environment.

THEORETICAL ACCOUNTABILITY

According to the *second axis* of Burrell and Morgan's schema, a dominant tension in assumptions underlying social scientific research relates to either an objective or subjective view of the world (ontology) or the nature of knowledge (epistemology). Burrell and Morgan (1979, p. 3) explain the subjective perspective as follows:

If one subscribes to the alternative view of social reality, which stresses the importance of the subjective experience of individuals in the creation of the social world, then the search for understanding focuses upon different issues and approaches them in different ways This approach questions whether there exists an external reality worthy of study. In methodological terms it is an approach which emphasises the relativistic nature of the social world to such an extent that it may be perceived as 'anti-scientific' by reference to the ground rules commonly applied in the natural sciences.

If human behaviour threatens the biosphere, causing 'escalating resource and climate wars, mass migrations, disruptions to social and economic infrastructure, and dire widespread poverty and chaos' (Mitchell et al., 2020), then social sciences may hold the key to

understanding how management thinking can embed change in organisations and how ontological and epistemological assumptions of those in management can be better aligned with ethical logics.

Epistemological assumptions, however, cannot be extricated from the characteristics of researchers, or observers (von Foerster & Poerksen, 2002), and ethical action is to always act 'so as to increase the number of choices' (von Foerster, 2003, p. 227). Ethical engagement related to epistemology should therefore afford stakeholders the greatest range of choices for moving forward in ways that are consistent with ecosystemic politics considering ethical ecological imperatives.

Given the caution with which 'truth' claims must therefore be taken, the notion of polarised objective versus subjective poles might be akin to the thinking that culminated in the Anthropocene. The idea of panarchy is perhaps useful in that it allows one to move beyond notions of subjectivity, objectivity, ontology and epistemology, highlighting the role of social consensus in constructing their boundaries. Assemblage theory and neocybernetics (systems as distinctions maintained within linguistic communities of practice) can therefore be considered as having paradigmatic implications. Burrell and Morgan's (1979) two axes, and the paradigms derived from them, are shown in Figure 1. Incorporating these concepts, however, requires augmentation of the Burrell and Morgan framework, to update it in light of environmental imperatives.

In their original model, Burrell and Morgan (1979) also differentiate ontologically between nominalism (conventionalism) and realism. For nominalists, the world 'external to the individual revolves around the assumption that the social world external to individual cognition is made up of nothing more than names, concepts and labels which are used to structure reality', which are 'regarded as artificial creations whose utility is based upon their convenience as tools for describing, making sense of and negotiating the external world' (Burrell & Morgan, 1979, p. 4).

Realism, however, postulates that 'the social world external to individual cognition is a real world made up of hard, tangible and relatively immutable structures' (p. 4) independent of naming or human perceptions.

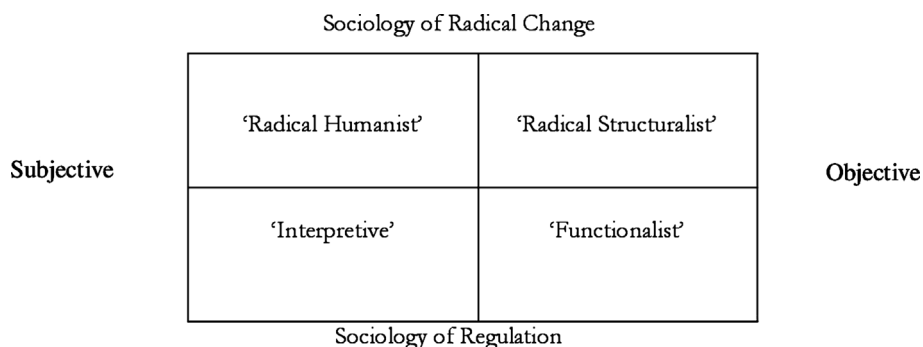


FIGURE 1 Burrell and Morgan's (1979, p. 22) four paradigms for analysis of social theory.

Sobering panarchic logics, however, suggest the Anthropocene represents not only ‘a limit point to the *modus vivendi* of modern Western civilisation’ but also a limit point to epistemological traditions dating from the Enlightenment (Mitchell et al., 2020). Mitchell et al. describe such historical epistemological approaches as ‘lineal’. According to Mitchell et al. (2020):

Lineal epistemology is therefore inadequate to account for systems and their complex and changing relationships, and although few might admit to living within a lineal epistemology, its influences permeate many aspects of life, including the dominant economic model which pursues limitless growth on a finite planet, and other ways of bracketing experience that do not incorporate the reciprocal and mutually specifying influences of interacting processes.

Differentiating theory development according to binary categorisations of radical change versus regulation and of subjective versus objective may usefully describe research. This may however be problematic if used as a starting point for research that requires one to locate one’s paradigm in one of the four quadrants and stay within it. If lineal thought has contributed to the Anthropocene through blindness to multiple imperatives required to sustain life on the planet, then an alternative perspective of theory making is required, more expansive than that of objective logic, and a derivative pursuit of profit at all costs.

Burrell and Morgan’s (1979, p. 23), four paradigms are ‘defined by very basic meta-theoretical assumptions which underwrite the frame of reference, mode of theorising and *modus operandi* of the social scientists who operate within them’, each identifying a separate social-scientific reality. Burrell and Morgan (1979, p. 25) stress that these paradigms

[O]ffer different ways of seeing. A synthesis is not possible, since in their pure forms they are contradictory, being based on at least one set of opposing meta-theoretical assumptions. They are alternatives, in the sense that one cannot operate in more than one paradigm at any given point in time, since in accepting the assumptions of one, we defy the assumptions of all the others.

This notion of incommensurability of paradigms is, however, not uncontested. According to Willmott (1993, p. 681), this notion ‘declared a new dogma’ essentially at odds with Kuhn’s recognition of continuity existing together with incommensurability in theory development. This schema is therefore anthropomorphic because it is based on a classification of human behaviours. It may

legitimise research that excludes other paradigms or points of view. Managers following logics of profit maximisation, for example, may also justify their behaviour according to ‘paradigm’ logics that exclude consideration of other stakeholder consequences (including non-human stakeholders).

Kuhn’s (1962) notion of incommensurability, however, acknowledges that normal science paradigms do change as cumulation of new evidence erodes resistance to new ways of thinking. Similarly, Lakatos (1970) uses examples of Newtonian physics to explain that a body of scientific theory can contain a ‘hard’ core of theory resistant to conflicting evidence. Thus, whereas Kuhn and Lakatos are concerned with resistance of fields to change in the face of novel findings and evidence, Burrell and Morgan’s (1979, p. 25) schema is premised on the assumption that a synthesis of different ‘ways of seeing’ is impossible. We suggest this assumption is unrealistic. Although some perceptions of reality might be socially constructed, other aspects of the climate catastrophe clearly derive from an objective reality and ecocentric theorising is necessary to ‘take materiality and non-human objects [such as the environment] seriously’ (Heikkurinen et al., 2016, p. 705). Panarchic ideas suggest a need for realistic theory making that recognises environmental imperatives.

Whereas some business ethics scholars have described the obligations of firms to the environment in terms of Rawlsian fairness (Phillips & Reichart, 2000), full organisational stakeholder status for the natural environment has also been suggested, requiring a ‘more holistic, value-oriented, focused and strategic approach to stakeholder management, potentially benefitting both nature and organisations’ (Starik, 1995, p. 207). Other longstanding work has sought to link issues of environmental ethics to philosophical theory and ethical extensionism (extending ethical standing to non-human stakeholders) (see des Jardins, 1993). However, des Jardins’s work highlights unresolved debates concerning whether ethical extensionism should be incremental or entail a total revision of ethical thinking itself. Similarly, ecological economics scholars, including Georgescu-Roegen (1979) and Daly (1997), criticise neoclassical economic theory and its blinkered focus on economic growth that fails to sufficiently incorporate environmental realities. Similar models prioritise profit maximisation above other stakeholder needs, and some finance models, such as that of Black and Scholes (1973), have been criticised for potentially contributing to the financial crisis (Stewart, 2012).

The concept of panarchy links epistemological perspectives that span Burrell and Morgan’s opposing meta-theoretical fields to reflect the complex reality we face in existential threats such as climate change. Solving them may require interactions of scientists, both natural and social, across almost all fields, requiring reconsideration of epistemological assumptions. Panarchy, as cross-paradigmatic theory, needs to integrate philosophically

diffused theories of business ethics as well as understandings of social forces shaping human behaviour, individually and collectively. Human extinction threats unite these perspectives, requiring multi-level and trans-paradigmatic thinking. Classic utilitarian goals such as maximising utility, or human happiness, and evaluating human action and behaviour according to its utility (Bentham, 1890; Mill, 1859; Sidgwick, 2000) can be linked with the utility of survival of human societies. Whereas utilitarianism posits good as its desired outcome, consequentialism considers an act morally correct on its consequences alone (Sinnott-Armstrong, 2003). Given Anthropocene threats, panarchic approaches stress a need to reconcile different perspectives and to spur new thinking to bridge them, better shaping our responses.

Of the normative ethics orientations, Kant's deontological perspective is largely rules based (Kant, 1959), conflicting with consequentialist logics of moral relativism. Nagel (1986) highlights a need to reconcile objective and subjective perspectives of the world, suggesting a vantage point from 'nowhere in particular'. A panarchic approach is similar to, and builds on Nagel's perspective, in that it might have the potential to theoretically reconcile paradoxical characteristics by explicitly identifying limitations of lineal epistemologies. We revisit this in a later section from the perspective of an ecological ethics of the *haecceity*.

Panarchic principles provide a lens to explore dynamic complexity or even evolution in norms. Ethical pragmatists extend Dewey's (1922) work to consider evolution in societal morality. Ethics and environmental ethics are also influenced by values, beliefs and norms (Ciocirlan et al., 2020) as well as religious traditions (Patel et al., 2019). Other work has also sought to extend phenomenological notions of radical ethics to management practice (Bruna & Bazin, 2018). This literature suggests substantial complexity in human behaviour and that the task of embedding ideas in organisations to produce environmentally friendly behaviour is challenging. Panarchic thinking offers a useful harmonising heuristic with which to make sense of this complexity.

Panarchic thinking explicitly considers interactions between levels of analysis. Neo-institutionalist approaches (Meyer, 1977; North, 1990) consider how institutions, or informal and formal rules, influence behaviours of groups and individuals. Irresponsible pursuit of self-interest associated with short-termism cannot be solved by markets alone, and longer term ethical thinking can better align self-interests and societal interests (Lin-Hi & Blumberg, 2012). Others have developed theoretical models to describe ethical relationships between stakeholder management theory and firm system theory (Rusconi, 2019). Further theory development based on panarchic principles may ultimately provide knowledge tools needed to deal with complex interrelationships between business and its ecological systems and

to unite natural and social sciences in the identification of existential threats, informing attempts to address them.

UNITING IN A CONCERN FOR ENVIRONMENTAL CRISIS

Concerns regarding problematic binaries have long been raised in social science research. For Latour (2000, p. 114) 'imitation of the natural sciences by the social sciences has so far been a comedy of errors', giving rise to polarisation between an objective approach akin to the natural sciences and a hermeneutic, interpretative approach.

Schisms between natural and social sciences thinking might be costly, considering looming environmental catastrophe, and social sciences research may hold the answer to how and why human value systems constrain innovation (Kuhn, 1970; Lakatos, 1970). We argue, therefore, that there exists a contextual imperative for management science and other fields to move toward an environmentally aware ecosystemic epistemology (Mitchell et al., 2020). According to this perspective, all phenomena, including management theory and practice, are recognised to exist at a nexus of consequence, whereby organisational and other forms of human behaviour can tip the ecological balance, with catastrophic consequences.

Management research seeking to benefit society might be considered Mode 2 knowledge (Gibbons et al., 2002) associated with interdisciplinary, multidisciplinary or transdisciplinary work that defies a narrow silo focus. Mode 2 epistemology and cross-paradigmatic thinking is more expansive than that offered by falsification (Popper, 1972). Complexities of multi-level and systemic interactions within which falsification-based tests are embedded need to be acknowledged. Whereas paradigms in Burrell and Morgan's (1979) schema exclude 'other' perspectives, a panarchic paradigm forces *inclusion* of other perspectives, to transcend anthropomorphic tendencies, or anthropocentrism, in that our embeddedness within ecological systems cannot as easily be 'abstracted away' in theorising. We consider innovativeness and radical thought necessary to escape lineal epistemologies and thinking that brings us closer to the brink of environmental catastrophe. However, we do not consider radical change incommensurate with status quo, in that there are surely contingencies or boundary conditions that dictate the appropriateness of any approach. We therefore suggest a *cross-paradigmatic mode of theorising* in the sense of paradigm terminologies of both Burrell and Morgan (1979) and Kuhn (1970).

More adaptive thinking might be needed to anchor scientific thought in an ecosystemic awareness of the consequences of human behaviours. Ecosystemic awareness therefore usefully takes the form of a conceptual framework that supplants narrow rationalistic thinking, as a

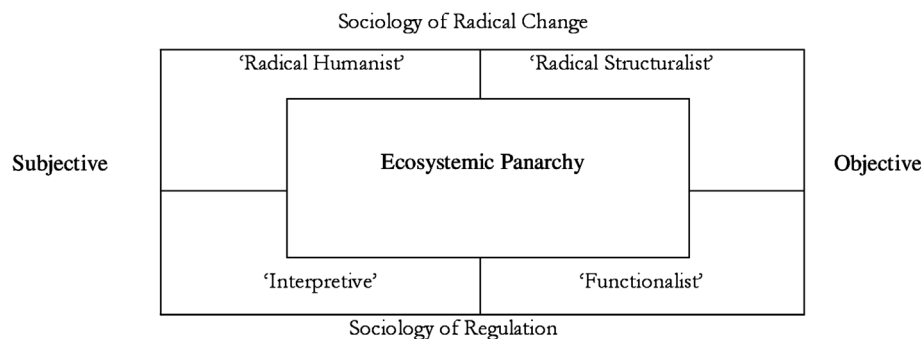


FIGURE 2 Augmentation of Burrell and Morgan's (1979, p. 22) paradigm schema.

post-paradigmatic principle of management thought and practice. Radical innovativeness of thought matched contingently with appropriate 'status quo' concerns together with conceptual and methodological rigour is perhaps a necessary condition for the emergence of an ecosystemic epistemology.

ECOSYSTEMIC PANARCHY

Given that we locate our arguments in relation to Burrell and Morgan's (1979) ontological and epistemological conceptions, it is now necessary to consider ecosystemic epistemologies corresponding with these conceptions. The radical structuralist paradigm typically focuses on 'deep-seated internal contradictions' in societies and work contexts, including structures and analyses of power relationships, and a 'view that contemporary society is characterised by fundamental conflicts which generate radical change through political and economic crises' (Burrell & Morgan, 1979, p. 34). Accordingly, these crises require humankind's emancipation from the social structures within which they live. Such conceptions highlight the quest for emancipation from crisis, and so echo the ecosystemic epistemological imperative, but there are important differences too.

Research associated with Burrell and Morgan's (1979) radical structuralist paradigm has owed its development primarily to Marx and also to a lesser extent to Weber, the synthesis of their work described as 'conflict theory'. It also owes its development to those inspired by Marx, including Lenin, Plekhanov, Buhharin and other Marxist sociologists of the New Left (Burrell & Morgan, 1979). Lacking from previous work, however, is a focus on ecosystemic panarchy, or the ethical imperatives that we suggest are necessary to reframe management theory and practice to embed a culture of environmental concern at the level of theory development. Given the ecological imperative, it must be asked whether dichotomous differentiations, or binary conceptions of these categories are still useful in describing theory development.

Given the discussions above, we argue that an augmentation of Burrell and Morgan's (1979) schema is

necessary, and Figure 2 illustrates the inclusion of the cross-paradigmatic or even post-paradigmatic category of thinking we term 'ecosystemic panarchy'. Certain implications of the incorporation of the ecosystemic panarchy dimension into Burrell and Morgan's (1979) model are now discussed.

ECOSYSTEMIC PANARCHY AND PRAXIS

Steffy and Grimes (1986, p. 330) define praxis similarly to Habermas, in terms of how individuals rationally analyse and reconstruct organisational conditions and themselves, with an ethical commitment to ultimately emancipate human potential. The social scientist's purpose is therefore to 'unify theory, practice, and praxis in order to liberate social members' (p. 330). This liberation might be at odds with instrumental activity determined primarily by technical reasoning, which can reduce to technical control and manipulation and withdrawal of subjectivity (Steffy & Grimes, 1986). However, given increasing uncertainty, unpredictability and risk associated with degradation of the biosphere, this goal of liberation benefits from being embedded at the level of theory making. Key to this is the identification of practical approaches to help individuals, organisations and societies shift in the direction of ecosystemic panarchy, and acknowledging different ways in which this shift can be tracked. It is also important to make explicit the implications before, during and after this shift, for practitioners in various organisations and policy makers at different levels and for researchers and for educators. Further, this approach would need to be presented, adopted and improved over time. We discuss these issues in the sections that follow, in order to give the theoretical suggestions here practical relevance.

Hence, we reflect on some contributions that panarchy, as a model for multi-scalar complex adaptive systems, may offer the development of ethical and environmental thinking as shaping and informing subsequent praxis.² Here, we revisit our earlier discussion on

²The authors acknowledge a helpful suggestion by a reviewer to make this link more explicit.

ethics now from the perspective of an environmental ethics as total gestalt. Imbuing environmental practice with an ethical awareness and sensitivity is an endeavour with a range of approaches, from 'land-based hermeneutics' Hinchman (1995) to an observation that rather than ethics being an abstract and distant toolset for evaluation and judgement, ethics is more 'an embedded and intimate relation to relevant others' (Smith, 2001, p. 15). Developing an ethics of place, Smith (2001) equips us with a way of locating ethics as a relation enacted with relevant others, while recognising that 'the environment' is itself, by definition, an 'other (ness)'.

In agreeing that the unit of survival is the organism and *its environment* (Bateson, 1972), we are describing a necessary relation with the otherness with which a unity (the organism, in question) sustains itself in the on-going autopoietic process of enaction, a dynamic whereby a unity differentiates itself from its medium in the conservation of its autonomy (di Paolo et al., 2018). The unity and its relation with its environment, as the unit of survival, are therefore an event, what Deleuze and Guattari (1987) refer to as a *haecceity*, a Stoic term, describing the assemblage of such relations with the other accounted for as a composite, a convergence, of various material flows and their affects. As they put it, a *haecceity* is 'inseparable from an hour, a season, an atmosphere, an air, a life', it's the 'entire assemblage in its individuated aggregate' (p. 262).

Panarchy then is a way of conceptualising cross-scalar influences on focal adaptive cycles that converge this gestalt, this *haecceity*. It models thresholds of cyclical metabolic processes, as these follow broadly anticipated patterns of production and destruction at varying scales of speed and slowness, size, time and duration (Walker et al., 2012). Consequently, panarchy enables policy makers, analysts and corporate managers to map the influences that converge on and compose the focal adaptive cycle, itself an *haecceity*. Ethics, informed by a panarchic lens, then becomes a means by which we can track how actions in the present, at this scale, feed forward, up to the next larger scale and into the scales of those systems, which inhabit us as distinctions, as composite unities. In short, how this translates into practice is that there is no 'out there', there is no safe place for us to ignorantly pollute, to externalise true costs. There is, in Barry Commoner's famous phrase, 'no free lunch' (Commoner, 1971). What our actions set in motion here and now resonate across the next larger and the next smaller systems from the perspective of the focal system. Panarchy gives a robust model with which to evidence the common ethical semiotic of the precautionary principle, along with other already well-founded principles such as acting locally while thinking globally and other precepts that are a common basis for ethical practice.

To identify practical approaches to transition, it is necessary to reconcile and locate these ideas within

broader (overarching) theoretical frameworks and trends in thinking about theory development. How then are these ideas reconciled? Stakeholder theory considers business activities to form a set of relationships between groups having stakes in these activities, with value created interactively between managers and these groups (Freeman, 1984). Post-normal science scholars highlight a loss of faith in some climate change research and a need for scrutiny by stakeholder groups to improve accountability in the research process (Funtowicz & Ravetz, 1994). Incorporating ecosystemic awareness of the consequences of human behaviours, a new paradigm of ecosystemic panarchy may offer not only a more effective epistemology to address the environmental consequences of human behaviour but also emancipation of human potential through enabling democratisation of science.

Changing power relationships

Technological developments and change in the value of information, data and knowledge may have implications for the historical evolution of power relationships. These shifts necessitate a new objective imperative, a need for those who now wield power in knowledge relationships to be ethically accountable, or to engage in phronetic planning (Flyvbjerg, 2001) to make explicit relations of power and values associated with this new order. This new structure of power echoes Deleuze's (1995) description of how capitalism has changed toward sales and markets, away from production toward products, with an increasing emphasis on codes as passwords governing who has access to information. Power accrues to those with control over new technologies. Deleuze (1995) explains how metaphors of previous societies, such as the clock, and later thermodynamic concepts of entropy and efficiency, have given way to the metaphor of Internet and Communication Technologies (ICT) and data-based transactions, which are characteristics of a 'control society'. These analogies also echo von Foerster's (2003) notion of cybernetics, Kauffman's (1995) emergent systems logics or even Foucault's (1977) panopticon of surveillance, as these entail some aspect of feedback effects that can have control functions. Thus, the new power linkages in societies can be described in terms of knowledge and flows of knowledge that channel this power. Checking power based on knowledge and access to it may require a post-paradigmatic focus on open and critical thought in a world characterised by post-normal science (Funtowicz & Ravetz, 1994).

Such shifts may intensify threats of environmental catastrophe and highlight limitations of paradigmatic thinking. A post-paradigmatic panarchic approach calls upon management theorists to explicitly acknowledge environmental or existential imperatives.

Nonlinear causal effects that defy notions of duality (binary thinking)

Ecosystemic panarchy is taken here to relate to an epistemology associated with the synthesis of nonlinear causal effects that defy notions of duality, which relates individuals, organisations, societies and economies to the ecosystems affected by, and affecting human behaviour. Whereas Burrell and Morgan (1979) differentiate between radical change and stability as incommensurate paradigms, we argue this is antithetical to the panarchic epistemology that accounts for both stability and change at the same time. Epistemological assumptions associated with ecosystemic panarchy may draw more from Campbell and Fiske's (1959) notions of convergent and discriminant validity implying that validity increases with incorporation of different perspectives of phenomena. In other words, ecosystemic panarchy may be associated with the need to consider multiple subjective perspectives of human agents or human agency, overturning assumptions of linear thinking and rationality in the management of complexity.

Conceivably, human perception and its related gestalts have been conditioned by lineal epistemologies, and reframing conceptions to take panarchic theoretical frames into account requires new thinking. If such new thinking is necessary to avoid climate and other man-made catastrophes, then changes in management thought and theory development are needed if businesses are to be positioned as potential leaders in innovation for societal benefit. In other words, business managers and strategists face an ethical conundrum. They may have to choose between the continued pursuit of narrowly defined short-term profit at the long-term cost of human and business welfare or engage in a conscious shift in strategy to more innovative business models reflecting a genuine concern for the environment as and its long-term viability. This ethical choice may be forced upon us by the Anthropocene.

If management is considered a practice of complex processes enacted by individuals who 'create, alter, and destroy institutions' (Bitektine & Haack, 2015, p. 50), then the discussion above offers useful insights into adaptations to the schema of Burrell and Morgan (1979). Further research can build on this work, by exploring the causal mechanisms through which environmental concern can become embedded in institutions. According to the tenets of neoinstitutionalism, individual and collective cognitions primarily explain macro-level aspects of institutions. Accordingly, the psychology of shared thought structures, or 'frames, schemas, mental models, logics, myths, or scripts', provides micro-foundations for understanding institutions (Cornelissen et al., 2015, p. 11).

At the heart of such perspectives is the notion of tensions between levels of analysis. By placing such ideas and related theory development within a context of broader panarchic influences (Mitchell et al., 2020), it is

easier to understand tensions between micro- and macro-aspects of management theory and how these relationships scale across levels. What seems to be required is to consider how business managers and strategists might think differently, in order to enact more adaptive responses to multi-scalar affects. The inclusion of ecosystemic panarchic principles in management thinking and theory development proposes a post-paradigmatic mode of research, with its own assumptions that surpasses the limitations of lineal thinking. Introducing post-paradigmatic ideas into current thinking and encouraging researchers to acknowledge them may help to embed an ethical environmental concern that ultimately transcends theory to take root in practice.

CONCLUSIONS

Given the potential contribution of management theory and practice to the degradation of the environment and broader socio-environmental context, the objective of this paper was to provoke new thinking to revisit certain assumptions underpinning the development of contemporary management theory. We presented an argument that ecosystemic survival necessitates a re-think of certain core assumptions upon which management theory has been premised. Incorporating the concept of ecosystemic panarchy, Burrell and Morgan's four paradigm schema was critically discussed. We hope that these discussions might offer useful insights for those developing management theory who wish to embed a concern for ecosystemic survival in management thinking, going forward.

The development of an increasing body of research that frames itself in accordance with principles of ecosystemic panarchy might help to convert such a paradigm from the realm of theory to implementable practice. Further research may suggest practical ways to do this. To this end, we hope the ideas introduced here contribute to debates about how management theory development can contribute to a sustainable future that benefits us all.

AUTHOR CONTRIBUTIONS

Both authors contributed equally to the development of this article.

CONFLICT OF INTEREST STATEMENT

The authors have no conflict of interest to declare relating to this work.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable because no datasets were generated or analysed. This article describes entirely theoretical/conceptual research.

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