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# Applying behavioural science to wicked problems: systems thinking for environmental policy in Aotearoa New Zealand

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## 1 Introduction

Developing effective policy for highly complex, long-term, societal issues requires processes that include systems thinking and behavioural insights and is part of the broad sweep of work on complex adaptive systems (Ostrom, 2009; Binder et al., 2013; McGinnis and Ostrom, 2014; Leslie et al., 2015; Turner et al., 2016; Cairney and Geyer, 2017; Elsawah et al., 2020). The recent article by Hallsworth (2023) presented a manifesto that formalised a structured approach for the application of behavioural science.

Here, we present a case study that embodies understandings of complex adaptive systems as well as the shift to applying behavioural insights articulated in the manifesto and as part of on-going work on Socio-Environmental Systems. In so doing, we present our experience of working in this complex and emerging space. The case study is the establishment and initial phase of a Systems Change and Capability (SCC) team within the Policy Implementation and Delivery unit of the Ministry for the Environment/Manatū Mō Te Taiao in Aotearoa New Zealand.

The Ministry is the Government's primary adviser on environmental matters. It also has a stewardship role which involves taking a long-term perspective on environmental issues when making decisions. Established under the Environment Act (1986), the Ministry is required to think broadly in developing its advice by considering the intrinsic values of ecosystems; the values people place on the environment; the principles of Te Tiriti o Waitangi/The Treaty of Waitangi<sup>1</sup>; as well as the sustainability of natural and physical resources and the needs of future generations.

As in most jurisdictions, the work of the Ministry is complex with no easy answers and often entails many ways to approach environmental issues. Typically this is achieved through legislation, policies, regulation and planning. The work of the SCC involves shifting the *status quo* by encouraging and supporting novel approaches and introducing new practices. More specifically, the remit of the SCC team is to bring non-traditional perspectives to bear on the work of the Ministry, shifting its practices to achieve its long-term outcomes.

1 Aotearoa New Zealand's founding document which is a broad statement of principles on which the British and Māori made a political agreement to found a nation state and build a government. It has played a major role in the treatment of the Māori population by successive governments and the wider population, a role that has been especially prominent from the late 20th century. It is not without its complexities and controversies

This approach goes beyond behavioural insights and focusses on integrating a blend of systems thinking, team dynamics, design thinking and behavioural science into an organization's core activities - specifically in environmental policy making in Aotearoa New Zealand. After an introduction to the SCC we discuss one example of the type of project SCC supports with which the authors have been involved. We then propose advice based on our direct experience working in SCC on implementing such initiatives and encourage government bodies to experiment and invest in systems approaches appropriate to their jurisdiction.

## 2 Context

### 2.1 Hallsworth's manifesto

Hallsworth (2023) manifesto provides a rigorous yet accessible argument for applying behavioural science to address complex global challenges in the early Anthropocene (Frame and Cradock-Henry, 2022; Mahecha et al., 2022). The analysis is highly detailed and discusses both successes and criticisms of, in the main, applying behavioural science. It provides a structured approach for future applications by practitioners, clients, academics, and funders. The manifesto seeks to address the challenge of applying behavioural science through three categories (Scope, Methods and Values) and ten associated recommended actions supported by responsible actors to achieve the overarching goals in a fast-changing world. Hallsworth's manifesto challenges applied behavioural scientists to set higher standards for their interventions and enable greater take-up. Furthermore, such a manifesto provides a way to address the erosion of the science-society contract, which is increasingly under extreme stress, if not already, as seen by some, broken (Glavovic et al., 2022).

Behavioural science is often implemented as a last resort to solve challenging situations, instead of being integrated systematically from the outset to address broad policy goals. It is thus unsurprising that public and private sectors have taken a mechanistic and tool-offering approach to applied behavioural science. As behavioural scientists immersed in both the study of complexity as it applies to environmental issues, we are engaged in providing real-time advice direct to policymakers and support the rich academic grounding of the manifesto. In particular, Hallsworth's discussion of a paradigm shift in the scope of applying behavioural science aligns with our own theorising and practice. We propose that the case study we present here exemplifies a multi-disciplinary approach which includes system thinking, promoting behavioural science as a lens, and building it as an integrated approach into organisations. Our work suggests this case study explicitly builds on Hallsworth's Scope and Values categories and addresses many of the criticisms of the behavioural insights (BI) approach he summarised, particularly limited impact, mechanistic thinking, overconfidence, and neglecting social context.

### 2.2 Beyond behavioural insights in Aotearoa New Zealand

Several BI teams have been established in Aotearoa New Zealand over recent years (Jones et al., 2021). However, the SCC team formed

at the Ministry for the Environment/Manatū Mō Te Taiao goes beyond traditional BI teams and embodies and extends the shift in scope of applying behavioural science to real-time policy making.

The Ministry's formal stewardship role involves a long-term purpose statement: "A flourishing environment for every generation/He taiao tōnui mō ngā reanga katoa." In practice, not all processes and practices are adequate to provide solutions to the non-linear, intertwined, urgent and, often, intractable issues that the Ministry seeks to address (Ministry for the Environment and Stats, 2022a). The Ministry sought to tackle these wicked problems when, in late 2021, it endorsed the establishment of the SCC team. The team has an enabling function that builds capability in understandings and applications across four deeply interconnected practices: systems, behaviour, teaming, and design. Underpinning these practices is a focus on non-linear thinking and embedding a deep "thinking in systems" philosophy and mindset which promotes questioning the place, time, and reason behind complex (environmental) issues.

The "systems practice" brings frameworks and methods grounded in systems thinking, design thinking, ecological systems and complexity science (e.g., see Leslie et al., 2015; Turner et al., 2016; Cairney and Geyer, 2017; Van der Merwe et al., 2018; Van der Merwe et al., 2019; Elsayah et al., 2020), and helps illuminate the connections, relationships and patterns of the many systems the Ministry operates with and in. The "behaviour practice" focuses on applying behavioural science and insights to influence and shift organisational practices and stakeholder behaviour. The "teaming practice" addresses ways of working with a grounding in interpersonal and team behavioural "systems." This teaming focus explicitly builds on the reality that teams perform better when they are connected, communicating, resilient, and have high levels of psychological safety (Edmondson, 1999). The "design practice" covers all aspects of human-system design with specific focus on design simplicity, co-design, user-experience, and humanistic design practices.

In mid-2021, a case was made and accepted for the Ministry to begin to experiment and adopt approaches which recognise that linear thinking when applied to complex and wicked problems is inadequate (Rittel and Webber, 1973; Head and Alford, 2015; Sun and Yang, 2016). The SCC team is charged with co-developing innovative ways of problem solving using the interdisciplinary nature of their practice areas. This requires a shift from a reductionist model of thinking to an increasingly integrated and holistic approach to ways of thinking, complex issues and challenges. It also requires working alongside implementation projects to help them understand this new approach, where the team can assist, and how systems-shift thinking can be routinely applied. The aspiration is for this to become normalised and integrated into the Ministry's core activities, with teams experiencing and appreciating the difference in outcome as a result. One example of this internal shift in practice is the development of a set of six interconnected "implementation principles" which were shaped using behavioural science principles, ensuring these were designed and created in a reflexive manner. The six principles are: think in systems; weave Te Ao Māori (Māori worldview); be guided by behavioural science; dare to innovate; put yourself in the user's shoes; and use evidence and data.

Challenged with this brief, the SCC team comprises practitioners (including authors of this Opinion piece) with diverse highly technical, expansive, and well tested inter-personal skills who were briefed to focus

on priority areas and seek to identify and apply insights from systems thinking, behavioural science and the other practice areas wherever possible. The team draws on a broad range of approaches, methods and techniques and are not constrained by any specific commercial or theoretical model or method. They operate with an approach described as a “meta framework for engaging in shifting the trajectory of systems”—which has four discrete phases, each offering flex in terms of methods, tools, and frameworks. This embraces a broader spectrum of methods that acknowledges points articulated in Hallsworth’s Methods Category, and we suggest this is a strength of this systems-shift approach worthy of consideration more broadly.

To illustrate, the SCC team has been nudging the Ministry system to the fact that every policy and regulation developed depends on human behaviour to work; meaning that it is, in effect, a behaviour change organisation. This assertion requires a consequential shift in how people think, act, and the systems or processes they design, follow and implement. To facilitate this process, the SCC crafted a concise six-step approach to clarify the essential considerations for embarking on practice change. These are considerations of the audience, timing, current practice, new practice, the actual intervention(s), and measures/indicators of change. While there exist diversity, nuances, and a range of ways to enact change, consideration of these six steps remain consistent and applicable to any practice change initiative. Currently, the SCC team is piloting this approach across several teams within the Ministry with a view to finalise a Practice Change playbook that will be available for use by anyone. This aligns with a recommendation made by Hallsworth (2023): “Rather than starting with a behavioural science project and then trying to scale it, we could start by looking at operations at scale and understanding how they can be influenced” (p. 312). This is the manner in which the SCC team has been operating, and the six-step approach illustrates just one example of a systems wide approach to diffuse behavioural science across the whole organisation—applicable to a single project, yet also reusable in many other domains and projects.

Based on this, and other examples of the work of the SCC over 15 months, the authors have gained experience and insight on the practical implications of adopting this type of approach and from which we seek to make recommendations.

### 3 Discussion

In his manifesto, Hallsworth places no specific weighting on the ten proposed actions to improve future applications of behavioural science and, we argue, any weighting would, in any case, be entirely context driven. Indeed, the context will be both specific to the jurisdiction in which the work is undertaken and the specifics of each case study. This is now illustrated by looking at the position which the SCC team holds within the Ministry for the Environment/Manatū Mō Te Taiao and how it operates. The SCC team explicitly acknowledge this contextual dependence, and refer to this as “noticing what this specific system needs” rather than blindly applying methods and tools.

Overall, the SCC team benefits from aspects unique to Aotearoa New Zealand, notably strong social capital in the general population (its alleged “two degrees of separation”), noticeable national environmental identity (Milfont et al., 2020), coupled with a pragmatic approach to problem solving that is futures focussed

(Frame, 2018). This provides a relatively open attitude to change processes and a willingness to consider new ways of working when supported by evidence of success and pathways to implementation. The work of the SCC is also needed to support the Ministry in addressing declining environmental indicators (Ministry for the Environment and Stats, 2022b).

An important value of the SCC’s work is its place alongside the integration of Te Ao Māori (Māori worldview) with its focus on te reo Māori (language), tikanga (protocols and customs), and its relationship with the Crown through Te Tiriti o Waitangi/The Treaty of Waitangi. Together these provide holistic and environmental integrity which aligns strongly with Hallsworth’s Values category, especially as this has been accommodated throughout the Ministry and is part of a shift in Aotearoa New Zealand society more generally (Harmsworth et al., 2016; Mika and O’Sullivan, 2014). This, in part, can be seen as the inclusive aspects identified by Hallsworth as the ‘No “view from nowhere.”’ However, we suggest that this is much more than a viewpoint. It is an essential part of a bi-cultural country undergoing a cultural renaissance with impacts throughout society. The underpinning systems-oriented approach of the team echoes the proverb/whakatauki which refers to living, thinking and working in the domain of “from the mountains to the sea/Mai i ngā Maunga ki te moana.” Despite using different terminology, both approaches reflect the same underlying need and desire to work with the ‘whole system’ and the fact we are an integral part of the environment, not separate.

We argue for increasing the emphasis on place-based systems-wide approaches that bridge research and practice rather than adoption of specific tools and processes. This justifies our emphasis on the Scope and Values categories in Hallsworth’s manifesto, which we see as of greater importance than the proposed actions within the Methods category. In particular, BI approaches will only be successful when governments risk investing in systems thinking as illustrated here, and where learnings are openly discussed in academic journals and by behavioural science communities of practice. We also suggest that the scope of BI approaches has, in the past, been too restrictive by focusing largely on individual behaviours, and this singular approach needs to be balanced with an approach which also looks at systems-level shifts in behaviour and practice. We argue for an integrated “both and” approach which pays attention to both the individual and the system (e.g., see Chater and Loewenstein, 2023).

We suggest that jurisdictions should develop their own version of Hallsworth’s manifesto with specific national characteristics and which, in turn, will be modified for individual projects. Moreover, we suggest less reliance on specific methods (such as randomized control trials) and more on creating a thinking and operating environment which privileges systems-oriented approaches grounded in local values, which seeks to assess and notice “shifts in trajectory” of the system being acted upon. This should not be seen as trivial or quick. Processes will take time to gain momentum and capability will fluctuate with the ebb and flow of staff with the capacity to undertake new ways of working. In other words, learning to support highly complex policy issues is, in itself, highly complex and bespoke solutions will have limited success. Developing nimble and mindful approaches need clarity of direction, consistent thought-leadership, will take time, and will require a high degree of reflexivity and adequate resources.

All this highlights both the commitment required in terms of risk acceptance by those commissioning this work, and by the novel set of skills required of the researchers and practitioners. With hindsight this is a critical component for overall success. It may not prevent the deterioration of the science social contract, nor reduce environmental and social impacts in the early Anthropocene, but the risk seems not only justified but of pressing importance. Or to put it another way, we note that the 10th characteristic from Rittel and Webber's original paper (Rittel and Webber, 1973) on wicked problems states that “the planner has no right to be wrong,” because they are liable for the outcomes and impacts their decisions might have in people's lives.

In the environmental context, given the declining state of the biosphere, any action or intervention must be based on the premise of not being wrong. This requires the behavioural science community to become much more present, active, and vocal in bringing their expertise to the fore of policy making.

## Author contributions

BF, TM, and HM made equal contributions to the conception, drafting and revision of the paper; provided approval for

publication; and are accountable for all aspects of the work. All authors contributed to the article and approved the submitted version.

## Conflict of interest

The authors are engaged to Aotearoa New Zealand's Ministry for the Environment/Manatū Mō Te Taiao to support development of its Systems Change and Capability Team. While they gratefully acknowledge the Ministry's support to develop this paper, the views expressed are solely those of the authors and not those of the Ministry.

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