SHOULD WE?

EXPLORING CHANGE AGENTS' CONCEPTIONS OF EPISTEMIC HUMILITY

By

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Abstract

This work explores how those engaged in innovation and advancing change consider their own ethical frameworks when they operate under uncertainty. Open-mindedness and critical self-reflection about the limits of one's knowledge, contained in the concept of Epistemic Humility, serve as a foundation to answer the central research question: To what extent does Epistemic Humility help changemakers assess if their change should be pursued? A review of existing literature informs both a grounding of epistemic ethics, virtues, and vices as well as the nature of knowledge and uncertainty, and indicates that epistemic humility may indeed create conditions for critical reflection on change initiatives. The depth of understanding gained through a review of relevant literature is compared to first-person accounts from those engaged with advancing change in the real world.

One-on-one interviews with practicing innovators and change agents shows how humility and de-centering of the self creates the conditions for a more holistic understanding of change initiatives, which, it is hoped, creates more desirable outcomes with fewer undesired side effects. Glimpses of an idealized future are offered by participants through the foresight workshop; a future where epistemic humility, open-mindedness, and critical reflection on our relationship with our own knowledge and beliefs is more widespread.

In an uncertain world, we need more critical reflection on whether change should be pursued, which requires weighing the pros and cons of action and inaction. This work suggests epistemic humility may be a key element in the making of better decisions. Much more work is required to understand how such mindsets can be fostered in decision-makers and change agents, but this work can serve as an entry-point to a deeper understanding of ethical action when pursuing change under uncertainty.

Acknowledgement

We live in swirling systems of systems and everything we do is informed and supported by other denizens of this place; known and unknown, conscious and non-conscious. That this work benefited from the usual suspects is without doubt. My wife and children, my parents, brother and extended family, my acquired family (in-laws and close friends), my classmates, my professors (especially my MRP advisor), and my friends and colleagues have all shaped me in direct and indirect ways and have all contributed in some way to this work. Particular thanks are offered to study participants who have added significantly to this work. The environmental and social structures and systems that support (to be very specific) knowledge acquisition and allow for life are obviously prerequisite to completing an MRP. I am thankful for the matrix of chaotic matter and energy transformation that has led me to complete an M.Des. at OCADu. While a worthwhile and significant step for me, it is of infinitesimally smaller importance at a global scale, let alone a galactic or universal one. I think that's the point. The universe doesn't exist for my education, but I, a conscious life form, owe everything to forces I will never understand or truly appreciate. This debt we all have is paid through our conduct with what we are given. I am truly thankful that I have had the opportunity to learn from so many and look forward to what I will learn in the future. Thank you.

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1 Introduction

The desire to shape the world according to our own views seems pervasive. In all areas of human life, there is a desire to effect change. Whether it is a return to an imagined past or reaching toward an idealized future, regardless of the arguments in favour or against, in whatever arena of life, people are in the habit of acting their will in the world. Some have tremendous power and can effect great change. Others have little to no ability to steer even their own lives in the desired direction, but still act as best they are able toward some end. The desirability of any endeavor will vary widely with the individual, with the rightness of any action seeming to derive from the perceived rightness of the anticipated outcomes. To what extent do we question our actions in advance of acting? Do we consciously and deliberately ask ourselves if we should act before we do? This work explores these questions using both academic and popular literature as well as the ideas from real-world practitioners of change.

There seems to be increasing polarization in politics, in everyday issues, and in worldviews. Traditional media and social media organizations alike cater to increasingly isolated groups and maintain more and more rigid lines about what is acceptable speech, thought, and action. Given the widely different views of what a desirable future would look like, acting toward any specific end will undoubtedly mean acting against what others would envision. There are a host of contemporary controversial issues that pit opponents in unwinnable bouts of tug-of-war with both sides convinced of their correctness and the correctness of the world they would create. In a desire to win, people dig their heels in and become less willing to listen, to compromise, or to learn from others. The outcome may come down to whoever holds the balance of power instead of being the result of a shared collaboration.

Even if there was perfect agreement on the desired outcome (and there very often is not), there would still be unanticipated consequences that movers could not have foreseen. Because of the high complexity and interconnectedness of the world, there will be interactions within social, political, financial, ecological and other systems that cannot be predicted. We very simply cannot effectively control all outcomes when we act (or do not act) in the world. This means that only some of the consequences of our actions can be evaluated in advance. If we are reflective about if and how we act, we must consider not only what we know and can anticipate but also what we do not know and cannot anticipate. How can we ethically evaluate what we do not know and cannot anticipate? Acting and not acting will both have consequences, so we must avoid the idea that we can simply stop acting out of fear or inertia. We must make decisions and act (or not act), the question becomes more about how we go about it.

In a polarized, chaotic world where outcomes are uncertain at best and where there is little to no agreement about what we (collectively) might want the future to look like, what do we do? This work does not propose to answer that question. Instead, this is a work about the question 'should we?'. It is a work that seeks to provide an understanding of if and how people are self-reflective when they make recommendations or act in the world. If we are self-reflective, seek others' perspectives, and sincerely question ourselves, we are humble in the face of what we do not know. We are opening ourselves to learning and appreciating what we might have missed. We are casting doubt on our own epistemic

frameworks; on the ways we know. In our polarized, chaotic world, perhaps practicing the virtue of epistemic humility and asking, 'should we?' might be a part of an answer to the broader question about action in the face of uncertainty. This work seeks to understand epistemic humility and how practitioners of change engage with its ethical ideas.

Perhaps by being open-minded and by always seeking to learn, we can be less likely to make mistakes. If our leaders listened more than they talked, if we learned to separate our ideas from our identities, and if we considered gaps in our knowledge when making decisions, would we have less conflict, fewer environmental disasters, and be caught less by surprise when things do not turn out as intended? This work is intended to fit one small piece of this puzzle into the whole, to draw out ideas about humility in the face of the unknown, and to find out how those who are striving to right wrongs understand their ethical obligations in the discharge of their work.

Why Me?

I saw the movie Jurassic Park before reading the book. My father took my brother and I to see it in theatres in the late summer of 1993. Although we were blown away by the advanced special effects, both visual and audio, the biggest impact on my young mind was a line from Dr. Ian Malcolm (played by Jeff Goldblum) when he said "Yeah, yeah but your scientists were so preoccupied with whether or not they could they didn't stop to think if they should." He was challenging the park's creator about the irresponsibility of cloning dinosaurs without fully appreciating what the unforeseen consequences might be (perhaps including the eventuality of a summer blockbuster). I read the book Jurassic Park a few years later and more fully appreciated the depth of Michael Crighton's critique and believe it applies much more widely than to just scientists.

Through my work as an environmental engineer, and through my studies in the Masters of Design in Strategic Foresight & Innovation (SFI) program at OCAD University, I have felt a deep affinity for the 'should we?' question from Jurassic Park. Engineering, and scientific applications in general are rife with examples where greater restraint and reflection might have enabled a more optimal design and avoided unforeseen consequences (thanks especially to hindsight). Within the more socially oriented design ethos of the SFI program, I have often wondered if practitioners of change initiatives are self reflective about uncertainty and the unforeseen consequences that could emanate from their work. I believe that it is important to act in the world to try to make it a better place. I also believe there is a place for exercising epistemic humility, and I am genuinely curious about how others orient themselves within the ethical questions raised by reflective consideration of what we do not know.

I am neither a philosopher nor an ethicist. A license to practice Engineering does not furnish a solid basis to comment on others' ethical foundation; epistemic, moral, or otherwise. As a practitioner of change, however, I can be self-reflective. I can share knowledge learned from others, both through the literature review undertaken and through the interviews and workshop findings. Rather than answering questions definitively, I can offer what I have found and share my perspectives. I believe that we all incur a non-trivial ethical obligation when we advocate for change, make recommendations, or otherwise act (or do not act). I have undertaken this work to better understand this belief, and to see if and how others grapple with this same idea.

Research Question

Ethics is a very broad area of inquiry, and epistemic ethics somewhat less so by comparison. Appropriate scoping is necessary to make this work manageable, given its framing as a Major Research Project at the master's level. As presented above, what is sought is an understanding of the extent to which practitioners of change, we who are acting, designing, changing, and making recommendations, think reflexively about the ethical ramifications of our change making. Do such reflexive thoughts manifest as ethical frameworks within those individuals and the teams, groups, and enterprises they make up? Are people generally aware that there will be unforeseen consequences of actions (and inactions)? Assuming they do see ethical obligations and understand that the chaotic and systemic nature of our universe will result in unintended outcomes, how do individuals who seek to shape the world conceptualize their activities and justify their aims?

Drawing from the field of epistemic ethics, and as will be explored further below, epistemic virtues and vices, these questions may become somewhat tractable. Specifically, epistemic humility (cast as a virtue) and its counterpart epistemic arrogance (a vice) seem to provide fertile ground for further understanding of how individuals and groups may understand their own approach to what they know and do not know when pursuing initiatives. If the pursuit of epistemic humility can help us address some of our ethical obligations with a view to better outcomes (however defined), then a better understanding of epistemic humility is desirable. The fundamental research question for this work is: **To what extent does Epistemic Humility help changemakers assess if their change should be pursued?**

Methodology

This project has been undertaken in a sequence of steps meant to enable a logical development given a relatively open-ended beginning.

Problem Framing: The initial framing of the project included the idea of Michael Crighton's Jurassic Park invective that scientists should 'ask if they should' as it relates to hubris of individuals advancing their own agenda. It also included concepts of ethical action under uncertainty drawn from a reading of Nassim Nicholas Taleb's Incerto. Refinements to the problem-finding process, as outlined in the introduction, led to the concept of intellectual or epistemic arrogance. From there, focused reading of scholarly work on the general topic of epistemic arrogance began to better refine and frame the question 'should we?'

Initial Literature Review: The initial focus of literature review was to better develop an understanding of epistemic arrogance and humility. The following sections will provide detail on what was encountered.

Research Question: With a much better appreciation of the philosophical and ethical basis to epistemic humility, the research question **'To what extent does Epistemic Humility help changemakers assess if their change should be pursued?'** was developed. This serves as the foundation for the rest of the study.

Literature Review: The process of formulating the research question and the work for the initial literature review identified other related areas of inquiry that bear on how we understand epistemic humility. Both the initial and final literature review portions have been combined to provide a more

streamlined and hopefully succinct description of the idea of epistemic humility. This literature review can be found in Sections 2, 3, and 4.

Primary Research Design: While an understanding of epistemic humility and how it might be fostered can be drawn from both scholarly and popular work, additional depth was desired. The opportunity to engage with practitioners of change who act in the world and understand from them how they engage with the concept of epistemic humility could not be passed up. Therefore, the inclusion of participant interviews followed by a group workshop was conceived and designed into the project.

Research Ethics Board Clearance: Given that this work would include human participants, clearance was sought and obtained through OCADu's Research Ethics Board.

Participant Engagement: Invitations for interested participants were sent through the SFI email group and several interested practitioners of change were engaged for the study. Each was asked to participate in a one-on-one interview as well as the group workshop.

Interviews: Seven interviews were held with interested participants. A series of open-ended questions were asked to facilitate a discussion about participants' views of their own activities as agents of change, their perceived ethical frameworks (if any), ideas about epistemic humility and arrogance, and how epistemic humility (if deemed desirable) could be fostered.

Workshop: Following the interviews, a workshop was held with the participants to enable a group discussion along the same lines followed in the interviews. The Three Horizons Model (Curry & Hodgson, 2008) was utilized both as an organizing tool to capture participants' thoughts about epistemic humility, and as a foresight tool to enable imaginings of how epistemic humility could be fostered.

Summarize and Compare Findings: Findings from the interviews and workshop were summarized and analyzed. In general, participants view listening and learning as key activities that lead to successful change and innovation. Participants' views seem to align with the ideas drawn from the literature. The focus was to identify common and disparate ideas to see how participants conceptualized the ideas investigated in the literature review.

Conclusion and Next Steps: Finally, some conclusions drawn from this study are identified along with some limitations inherent in the study. Additional areas for further inquiry are also suggested.

2 Problem Framing

To what extent does Epistemic Humility help changemakers assess if their change should be pursued?

At the heart of this question is the idea that agents of change make conscious or unconscious decisions to proceed with their work, to innovate, or to change something into something else. Whether they are deeply self-reflective and deliberate in making this decision, or it is thrust upon them and they spend little or no time thinking about why, working toward change reflects an explicit or tacit acknowledgement that the task ought to be undertaken. The research question is closely focused on this acknowledgement; on whether the agent knows why they 'should' proceed. The degree of deliberation or consciousness with respect to the justification of the change may depend upon the characteristics of the individual as well as the characteristics of the area of change itself, and both are critical to this investigation.

To attempt to answer the question requires a consideration of the merit, goals, and justifications behind the initiative, as understood by those advancing the innovation or change. The nature of the change and the nature of the individual's rationale are two elements that must be considered. The research is therefore being conducted to provide:

- An internal focus on the change agent and how they can learn about the world and make decisions from that knowledge. For this study, epistemic humility is offered as a means of assessing how open an agent of change might be to novel information.
- A broader understanding of what constitutes knowledge and uncertainty inherent in the agent's area of interest, and how uncertainty may influence an agent's ability to act. An investigation into the nature of knowledge and uncertainty informs the constraints and terrain in which an agent acts.

These two parts of the question will be dealt with in the reverse order, starting with knowledge and uncertainty (Section 3), then exploring Epistemic Humility (Section 4). Before exploring these two areas in greater detail, some further scoping is appropriate.

Iterative Nature of Agency

When a change agent is at work, their understanding of the world is translated into action. That action has outcomes, and those outcomes will cause adjustments in how the agent and others understand the world. It is important to stress that not acting is also an act. Inaction can have consequences in much the same way as actions do, as no behaviour, initiative, or design is neutral (Thaler & Sunstein, 2008). This cyclic and iterative process (refer to Figure 1) can be best understood using systems thinking where every action (and inaction) causes ripples that act upon the agent in ways that are unpredictable.

Understanding: The change agent's understanding of the world will include their knowledge, beliefs, goals, and aspirations, as will be further explored below. Their understanding depends on their background and experiences and is shaped over time. Part of their understanding may be oriented toward

aspirations, goals, objectives, desires, or other ways of seeing how their area of interest could be improved.

Acting: Drawing on their understanding of the world, the agent acts by communicating with others, by creating businesses, organizations, campaigns, and projects, and by putting their effort into actions they believe will result in the desired outcome. The change that comes about because of the action is not a simple, linear, isolated thing. Change as conceptualized in Figure 1 involves people acting on other entities in the world with a purpose of some kind. The world can be understood as systems of nested systems where actions cause complex and chaotic reactions. Systems have three component parts "elements, interconnections, and a function or purpose." (Meadows, 2008, p. 11). For change or innovation, someone is acting on other people or things for a purpose of some kind, and it is helpful to understand change and innovation efforts in a systems context.

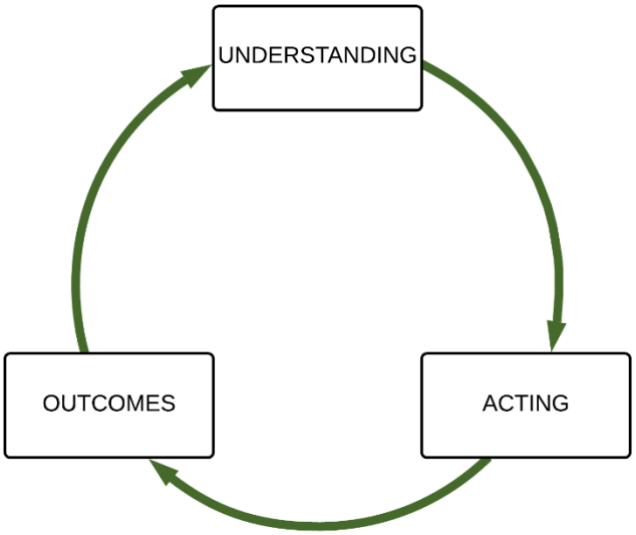

Figure 1 - Cyclical Model of Change

Outcome: Clearly, even small changes will cause subsequent changes and adjustments in the associated systems and will result in a cascade of outcomes. The outcomes may align with the intent of the change agent or may be unanticipated. Outcomes may be deemed desirable or undesirable (or both, by different people). The outcomes will in turn influence the lived experience of those impacted, likely including the change agent themselves, and thus contribute to an adjusted understanding of the world.

This simplified model will be useful in situating a change agent's focus as we link their understanding and goal-oriented thinking and doing with any ethical framing they apply to their work. One oversimplification inherent in this model as presented is that an agent's understanding can operate at different levels simultaneously. For instance, they may have goals and objectives that are well understood, but for which they cannot provide explicit justification other than perhaps as a felt sense of calling or purpose. To explore this oversimplification, we turn to a foresight tool known as Causal Layered Analysis.

Causal Layered Analysis

Another element of the framing of this study includes (see Figure 2) a Causal Layered Analysis (CLA), which is often intended to be used as both a way of integrating "empiricist, interpretive, critical, and action learning modes of knowing" (p. 1) as well as a foresight method (Inayatullah, 2004). In this case, the CLA framework is used as a means of structuring how change agent's behaviours, activities, and motivations may be operating at the four levels of the CLA. This CLA was populated by the author and served as an exploration of the author's understanding of the topic and as a means of structuring different levels of that understanding. Thus, the CLA is not intended as an authoritative representation of what is actually occurring, but as a way of shaping and refining the scope of the investigation that follows.

Level	Level Description (adapted from Inayatullah, 2004)	Change Agent Analysis
Litany	The litany level consists of what is readily observable in the area of focus. It could consist of people's actions and behaviours, of the types of work people do, the way they interact, and the opinions formed.	Creating new systems and services, protesting, civil disobedience, creating new technologies, meeting to discuss change, construction of built environment
Cause/System	The cause/system level describes the causes of what is observed at the litany level, and explains the types of systems (for example social, natural, political etc.) that give rise to the litany.	Dissatisfaction with status quo, desire to correct current and historical wrongs, improve quality of life, equitable distribution, make money,
Worldview	The worldview level consists of the unconscious mental structures and ideologies people both individually and collectively have that can explain the systems and causes at the Cause/System level above. This can include common viewpoints and opinions held by various groups.	Compassion and care for others, conceptualize the ideal, desire for growth and development, belief in the efficacy of human effort
Myth/Metaphor	At the myth/metaphor level reside the often emotional and archetypal elements that give rise to the worldviews conceptualized in the level above. This could include stories or metaphors that represent the deepest levels of human understanding.	Higher power, platonicism, author, creator, student,

Figure 2 - Causal Layered Analysis

3 Knowledge and Uncertainty

Known and Unknown

Those occupied with bringing about meaningful change and innovation necessarily base their efforts on their perception of the world. Exactly how an individual's or group's understanding of the world is formed and held is beyond the present scope. What is important is to attempt to outline the relevant categories of knowledge and uncertainty that will shape the basis upon which a change agent understands and acts. What we know of the world can be explicit, in that we are able to express what we know, or tacit, where the knowledge is evident, but is difficult or impossible to articulate (Nonaka, 1994). Both tacit and explicit knowledge are leveraged in decision-making, and, by extension, are part of how change and innovation is undertaken. Dreher (2018) and Faulkner et al. (2017) provide a framing of knowledge attributed to Donald Rumsfeld, wherein knowledge is characterized as belonging to knowns, known unknowns, and unknown unknowns. These categories are useful when considering a change-agent's work, since they are more likely to base decision on what they know and on their sense of what they do not know. Unknown unknowns may represent knowledge that cannot even be fathomed by change agents, and, therefore, may be completely inaccessible to them. Further, Faulkner et al. (2017) suggest that there are two kinds of unknowns; areas where the agent has no knowledge, and areas where the agent believes they have knowledge, but are partly or wholly mistaken about the correctness of what they hold to be true. Jaana & Lauri (2021) describe the evolving field of agnotology, or the epistemology of ignorance, and focus on how Rumsfeld's idea is a key idea within a growing field within epistemology focused specifically on negative knowledge, or what we do not know. An alternate structuring is offered by Dhami et al. (2019), who offer a taxonomy of knowledge made up of certainty, risk, subjective uncertainty, ambiguity, and true uncertainty. Figure 3 shows graphically how these different models of knowledge and uncertainty relate to one another.

Two other important and relevant concepts are that of rationality and bounded rationality. Within economics and other fields, agents were historically defined as 'rational', in that they based their decisions self-interestedly on factors such as their knowledge, preferences, and budgets, and reached a conclusion through deliberation (Hong et al., 2020). Dependent upon the degree of uncertainty, Dhami et al. (2019) highlight how such rationality is based on the Bayesian Rationality Approach, which states that "Decision makers...have complete, transitive, and continuous preferences; possess unlimited attention, computation power, and memory; are not influenced by frame dependence of problems if the frames are informationally equivalent; make cold, calculated decisions in which emotions play no role; effortlessly follow all the laws of statistics and mathematics including all the latest research in these areas; engage in instantaneous mathematical optimization to static and dynamic problems; and update their prior beliefs using Bayes' law" (p. 8). This rational agent was christened homo economicus, or Econs by Thaler & Sunstein (2008), in contrast to actual people (Humans), who do not possess such decision-making prowess. After the 1980s, the sub-field of behavioural economics came to the fore and challenged the basis of rational agents, offering the concept of bounded rationality to explain deviations from expected rational behaviour and what actually occurred (Sent, 2018). People behave irrationally (Kahneman, 2013) because their rationality has limits, or is bounded by their own experience, knowledge, and background (Simon, 1947, as reported in Hong et al., 2020). Thus, a change agent's

understanding is a reflection of themselves, and their goals and decisions will therefore be influenced by their background, what they know, and what they do not know.

Lest we interpret our limited knowledge, negative expertise, and uncertainty in a wholly unfavourable light, it is important to consider that innovation and improvements in knowledge spring from places beyond our ken. "The positive aspect of negative expertise, however, lies in the recognition

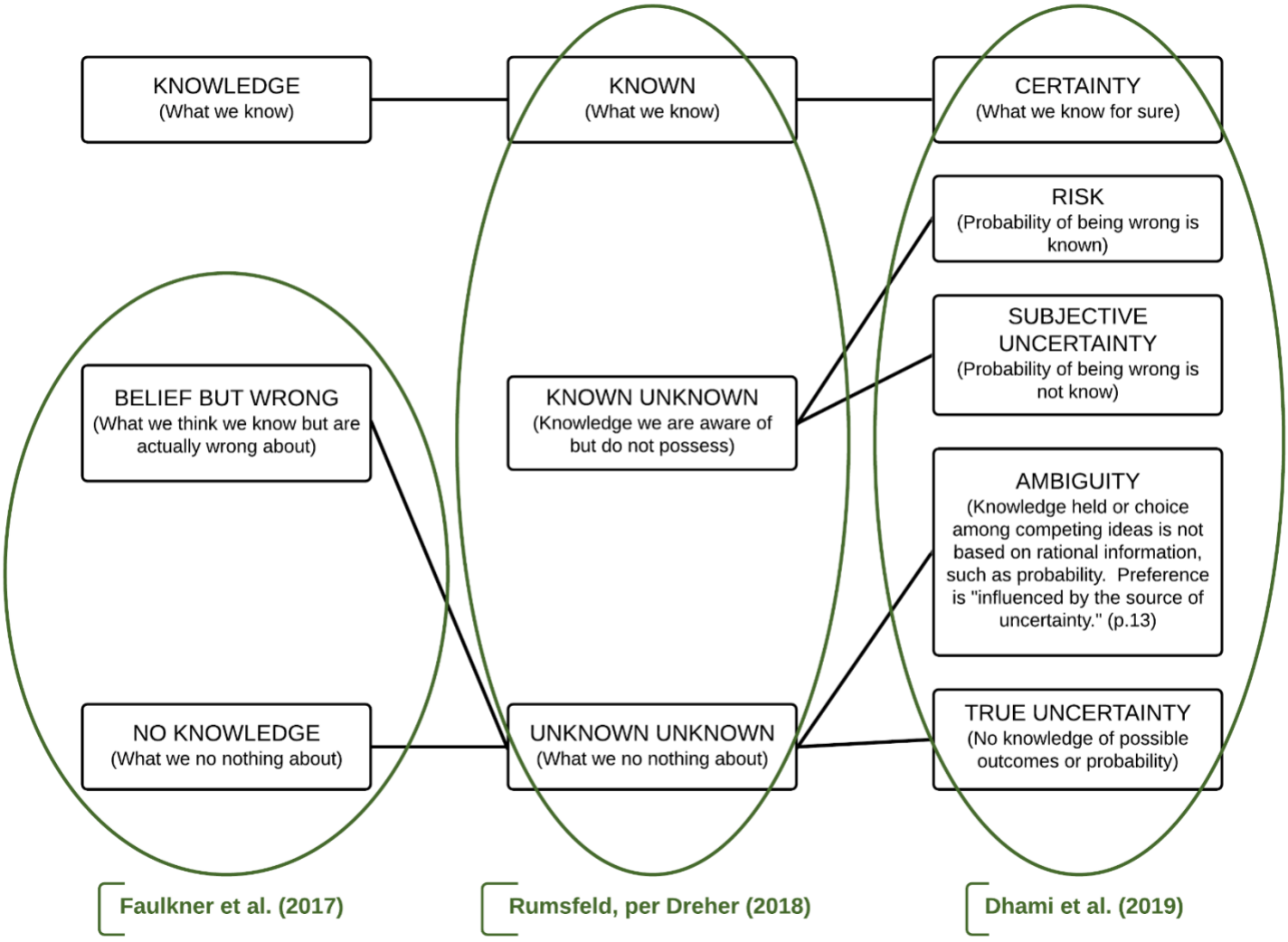

Figure 3 - Comparison of Three Models of Knowledge and Uncertainty

of the uncertainty as being a source of innovation, errors as being integral to learning, and unlearning as being an important skill in relation to knowledge formation." (Parviainen & Lahikoaien, 2019, p. 3888). Kline & Rosenberg (1986) make the case that innovation springs from “a complex of different ideas and solutions” and that “the processes and systems used are [themselves] complex and variable.” (p.279), and, therefore at least partially non-rational. Trial and error, experimentation, and serendipity are important antecedents of innovation. What may be a critical factor in ethical conduct is the explicit acknowledgement that one is operating in the liminal space beyond certainty.

Bias

Individuals cannot know everything and must therefore have some way of addressing uncertainty. Their ways may be characterized as epistemically arrogant, humble, or somewhere in between. Entire fields of inquiry have as their objective to better understand how humans deal with uncertainty (see Kahneman (2013) and Taleb (2001) for example). The exploration of two concepts, heuristics and bias, are helpful, however, to better understand how individuals deal with uncertainty, and how these ideas might influence and be influenced by epistemic arrogance and humility. Heuristics and biases are shortcuts that enable decision-making in the face of imperfect knowledge, whether such shortcuts are acknowledged or not (Taleb, 2001).

Within various academic and practical disciplines, many different biases have been identified, named, and explored. Biases are mechanisms that enable individuals to deal with knowledge gaps, often in ways that are unconscious and automatic (Kahneman, 2013). Because biases do not fill knowledge gaps with true knowledge, they represent errors or mistakes in thinking that cause a disconnect between a mental map and reality. Epistemic humility would require both an acknowledgement of bias and a concerted effort to correct the subconscious mistakes caused by bias. Three biases will be discussed to provide examples of how they relate to epistemic ethics. Hindsight bias (Taleb, 2001) relates to how past events viewed from the present appear in retrospect more ordered and predictable than they were. Overcoming this bias requires an acknowledgement that what seems obvious in hindsight was not obvious before the event occurred. Epistemic humility would require not only an acknowledgement of the bias, but also an attempt to recognize that the complexity of current events makes predictions of future events problematic, since our confidence that we saw past events as likely is the result of hindsight bias, and not of predictive power.

The hindsight bias is similar to the overconfidence bias, which relates to the Dunning-Kruger effect, wherein one with less experience or expertise may express a higher level of confidence than someone with significant expertise in the area in question (Wright, 2018). True experts are aware of the limits of their expertise and although they can competently perform within the area of their expertise, they seem to have a lower feeling of confidence than those who are not experts. Non-experts, since their level of expertise is lower, may not know enough to know what they do not know, and therefore express higher levels of confidence. Experts are still subject to the overconfidence bias in many cases, however, as their confidence in themselves may be misplaced when they are asked to perform in areas beyond their expertise. In some cases, it is possible that the higher social station occupied by experts may foster epistemic arrogance if experts cannot maintain their sense of fallibility (Battalio et al, 2019). Epistemic humility may serve again to limit the expression of the overconfidence bias by maintaining a humble perspective in evaluating one's current state of knowledge and assisting in the acquisition of new knowledge to improve one's understanding.

Confirmation bias occurs when individuals bolster their current knowledge and beliefs by acknowledging information that corroborates their understanding and ignoring conflicting information (Lynch, 2017). While some may purposefully avoid information that conflicts with their worldview, the confirmation bias can also be unconscious and done without the individual's awareness. Purposeful recognition that we all have limits to our knowledge and active attempts at learning from information that seems at odds with our understanding (i.e., epistemic humility) may help to limit the impact of confirmation bias (Kahneman, 2013), but, as with all biases, we can never be sure we have

succeeded. Further research is required to better understand how biases function within human brains and how the effects can be mitigated (Battaglio et al., 2019). For the purposes of this work, however, epistemic humility has a place for individuals working to overcome their biases.

Similar in some ways to biases, heuristics are ideas that are usually more consciously held than biases, but which also serve to enable decision making and action in the face of uncertainty. Battaglio et al. (2019) describe how heuristics are shortcuts that are advantageous from an evolutionary perspective, but that they may lead to systematic errors. It is undeniable that heuristics can simplify conceptions of complex information and systems (Kahneman, 2013) and prevent stagnation, but this simplification represents a possible inaccurate understanding of the world (Taleb, 2012). Given that heuristics generally arise thanks to experience over time, the oversimplification may be appropriate depending upon the area of concern, provided that excessive abstraction is avoided (Taleb, 2012). While not a perfect antidote, epistemic humility may again be of assistance in seeking where heuristics represent a mismatch between anticipated and observed phenomena and improving the heuristic through the knowledge gained thereby.

Real World Uncertainty

Acknowledging our biases and working to identify the shortcomings of our heuristics can be an important step in making better decisions. In many cases, small mistakes can be corrected, and, over time, these corrections represent an accumulated improvement in our understanding of the world. In other cases, however, such mistakes can have significant consequences that were not anticipated. These may result in breaks in the continuity of gradually improving models of the world, called revolutions by Kuhn (1996). These significant unforeseen events may significantly shape our understanding of the world and may enable the identification of sources of risk that were underestimated previously. This description loosely aligns with an event labelled by Taleb (2007) as a Black Swan. For Taleb, a Black Swan is an event that is an unanticipated outlier relative to anticipated similar events, has a significant impact, and, most curiously, fosters a need to provide post facto explanations that suggest the event was or could have been predicted, even if it wasn't. A prime example of a Black Swan offered by Taleb is the 'Turkey Problem', where a domesticated turkey lives its entire life with an increasing confidence about what life will hold for the next day, until the day the turkey is slaughtered. The turkey's death is a Black Swan from the turkeys vantage point, but not from the farmer's. Challenges to the idea of a Black Swan are offered by Mueller & Stewart (2016), who argue that the Black Swan status for an event may be more determined by the response to the event than the event itself. In any case, the concept of a Black Swan event is helpful as it illustrates the idea that there are identifiable ways people deal with uncertainty, and that significant unforeseen events can and do occur, despite our efforts to improve our understanding of the world.

When faced with an uncertain circumstance, a logical approach is to be cautious and to investigate prior to committing to a course of action. In practice, particularly in complex situations, this is much easier said than done, considering that the consequences of inaction may be as uncertain as those of action. In contrast to the more academic discussion of knowledge, uncertainty, and the limits of knowledge provided above, it is important to consider some of the ways uncertainty has been factored into decision-making in real-world applications. One way of approaching uncertainty cautiously is the Precautionary Principle. One definition of the precautionary principle is offered by Kriebel et al. (2001) as follows:

"When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically." (p.871)

Many invocations of the Precautionary Principle also contain the idea that the burden of proof regarding the suitability of the proposed change belongs with those recommending the change (Pinto-Bazurco, 2020). This contrasts with the standard 'innocent until proven guilty' idea where a change is permitted until there is demonstrable evidence that it should not be (Gardiner, 2006). The Precautionary Principle "...promotes reflection in the face of uncertainty, arguably leading to better outcomes." (Pinto-Bazurco, 2020, p. 7.). Such reflection, particularly if self-focused, falls within the idea of epistemic humility, and asks that proponents of a course of action consider more than their own interests and knowledge when undertaking a change.

There is significant critique levied against the Precautionary Principle, however, that suggests it is poorly defined and is not held in high repute (Gardiner, 2006). Such critique may limit the suitability of the Precautionary Principle as means of applying epistemic humility to real-world problems. The primary critique is that the Precautionary Principle is, in all its various definitions, too vague to be considered coherent when strictly applied, and trivial when applied generally (Boyer-Kassem, 2017). In essence, the principle will suggest outcomes that depend largely on the information available (DunnGavin et al., 2015), and may allow decisions to be made based "... on fear and emotion, rather than on science." (Kriebel et al, 2001, p. 872). Vlassov (2017) makes the claim that applying the Precautionary Principle may involve using limited evidence as justification to achieve specific political ends. He describes how medical advances may be slowed or stopped to prevent deaths from unproven procedures or medication, while at the same time others may die because of not getting needed medical interventions, even if experimental. As a tool to assist with decision-making under uncertainty, some (Gardiner, 2006, Sunstein, 2005, and Stefánsson, 2019, for example) claim that the Precautionary Principle is no more effective than a cost-benefit analysis. Perhaps the value of the Precautionary Principle is the idea that it is a way of addressing risk and putting the onus on claims of overall benefit to be advanced by the proponent (Pinto-Bazurco, 2020). Any advancement of such claims may depend upon the receptiveness of polarized parties to debate openly and courteously. Any contentious evaluation of cost-benefit analyses may depend upon the open-mindedness of those involved. Epistemic humility may be a prerequisite to evaluating competing ideas to solve uncertain problems.

4 Epistemic Ethics

Introduction to Epistemic Ethics

If a person is truly open to the idea that they could be wrong, then they are exemplifying epistemic humility. Epistemic humility is about acknowledging in a non-trivial way the limits of our knowledge and belief. On the other end of the spectrum from epistemic humility lies epistemic arrogance. When we connect the virtue/vice pair of humility/arrogance to our epistemological understanding of the world, we can characterize our degree of confidence in our knowledge and how open we are to changing what we believe to be true. De Bruin (2013) describes epistemic virtues as "virtues that guide the ways we deal with information, form beliefs and acquire knowledge." (p.584). Here, we are concerned specifically with the virtue of epistemic humility, although related virtues are discussed below for comparison. Instead of 'epistemic', the term 'intellectual' is sometimes substituted in the literature with generally the same meaning (Ashton, 2019 and Lynch, 2019, for example), so as we discuss epistemic humility (or arrogance), we could equally be discussing intellectual humility (or arrogance). What follows is an elaboration of these initial oversimplifications. There is a rich body of literature that describes what epistemic humility is, some of the traps we can fall into that foster epistemic arrogance, why we might choose humility over arrogance, and the ways in which our epistemic stance influences political, cultural, and social systems.

That there are limits to our knowledge should be obvious. No one knows everything and for every belief, there seems to be others who believe the opposite. In many cases, even the least controversial ideas have been debated (Ashton, 2019). With Socrates' statement 'I know I know nothing', the limits to knowledge and a questioning of what constitutes wisdom has been a prevalent concept within philosophy and beyond (Dreher, 2018). A complete treatise of epistemology is well beyond the scope of this project, and further, Baird & Calvard (2018) suggest that epistemology often does not consider the epistemic ethics we are concerned about for this work. Luckily, discussing epistemic humility does not require a deep understanding of the epistemological foundations of knowledge and belief. Rather, a more pragmatic approach consists of applying ideas from practical ethics, which Buchanon (2009) describes as "... the attempt to use reasoning to determine what we ought to do, as individuals and collectively" (p.280). For the purposes of this work, understanding epistemic humility simply requires an acknowledgement that we all have areas of ignorance and that we may not know where our knowledge is deficient.

To add another constraint on the scope of this work, the entity that is under consideration with respect to their ethical understanding is one who identifies as an agent of change. We are concerned with not just any person or organization, but with those who are directing their efforts toward some end; they are attempting to make change. Buchanan's (2009) definition of a philosopher is quite apt to the current purpose, as he presents "one who purports to offer a systematic view of reality or at least of social reality, a view that includes prescriptions for how we ought to live…" (p.278). In other words, someone who is attempting to suggest to others what they should do, how they should act, and how they should think. This may be an individual person but could also be an organization of individuals. Companies, firms, boards, and other organizations can exhibit habits with respect to their epistemic frames (Baird & Calvard, 2018). Further, as Lynch (2018 and 2019) points out, group loyalty and 'tribal' affiliations can often trump individual epistemologies. Where individuals identify with a group, any suggestions of epistemic

deficiency may be seen as an attack on the individual. Having a sufficiently broad definition of who and what constitutes an agent of change will be important later in this discussion.

What follows is a deeper look at epistemic ethics. The next section provides definitions of epistemic virtues and vices. Drawing from these definitions, epistemic humility and arrogance are explored with greater precision that will enable better comparison with findings from study participants toward the end of this work. Then, the degree of responsibility for our epistemic vices and virtues is explored, followed by a discussion of the desirability and undesirability of epistemic humility in particular. Section 4 concludes with ways the literature offers of fostering epistemic humility.

Epistemic Virtues and Vices

In ethics, what enables cultivation of 'goods' are described as virtues and what contributes to 'harms' are considered vices. Baird & Calvard (2018) suggest that 'goods' include Truth, Understanding, Wisdom, and Justice. Buchanan (2009) suggests that virtue ethics offers a reasoned path to conceptualize our doing in the world. There is an important distinction to be made, however, between moral and epistemic goods and harms (and therefore virtues and vices) (Fricker, 2007). Baird & Calvard (2018) suggest that moral and epistemic virtues and vices apply to different actions taken by an agent. Aristotle (Dreher, 2018) suggests that moral virtues apply to actions and epistemic virtues apply to belief. De Bruin (2013) offers a slight contrast in suggesting that epistemic virtues guide the ways we deal with information, form beliefs and acquire knowledge and that "...moral virtues aim at the good, epistemic virtues aim at the truth." (p.588). For this work, Manson's (2020) suggestion that epistemic virtues are those "...conducive to the valuable goal of attaining knowledge" (p. 9) hits closer to the idea that virtues and vices pertain to both the knowledge and beliefs an agent has and how they formulate, maintain, and change that knowledge and those beliefs.

The general idea is that epistemic virtues help us attain true knowledge, and epistemic vices hinder us. One could, of course, challenge the concept of vice and virtue and epistemic ethics in general as a western framing that does not account for non-western ethical or moral formulations. While some of the sources consulted did consider non-western ideas, the focus of the literature accessed for this study was firmly within western philosophy, ethics, and epistemology, and the discussion reflects this reality. Some of the epistemic virtues identified in the literature include self evaluation, including "...owning one's strengths and weaknesses" (Wright, 2018, p.16), love of knowledge, tolerance, and humility (Parviainen & Lahikoainen, 2019). The opposites of these virtues are seen as vices: overconfidence, dogmatism, intolerance, and arrogance. There appears to be a disagreement in the literature about whether the goal of attaining true knowledge requires the cultivation of virtue or the avoidance of vice (or both). Tanesini (2016) suggests that vice is not simply the absence of virtue, and that the virtues should be cultivated and the behaviours characteristic of vices be avoided. In contrast, Bailey & Calvard (2018) suggest that Cassam's (2014) 'homo philosophicus' and Thaler's (2000) 'homo economicus' are oversimplifications and that our focus should be on injustices (and therefore vices) instead of striving for perfection (which the virtues are said to represent). Regardless of where the focus is believed to be best placed, the literature strongly supports the generalization that individuals and groups should strive to embody epistemic virtues and to eschew behaviours associated with epistemic vices.

Definition Refinements

Lynch's (2018) definition of epistemic arrogance includes an element of privilege and power and suggests that one can be close-minded but not arrogant, if the close mindedness is not accompanied by notions of superiority. Lynch (2018a) refines this idea by adding that the epistemically arrogant believe their views cannot be improved by incorporating knowledge from others, since their belief in their own superiority discounts those others as possible knowers. Tanesini (2016) seems to agree when she states that "...the arrogant presume that their alleged or genuine superior intellectual authority entitles them to a range of privileges which they deny to others" (p.75), where such privileges are epistemic ones related to how such individuals justify themselves as knowers. She further states that "Arrogance does not result from one's faulty or accurate estimate of one's own intellectual worth; rather, it is determined by the manner in which, and the reasons why, one cares about one's abilities, talents, faculties, skills and successes." (p.83). These characterizations imply that epistemic arrogance stems from notions of superiority, which could be conscious or unconscious, but closely linked to undervaluing the epistemic worth of others and elevating their own for reasons that are not epistemically justified.

In contrast, epistemic arrogance can also be less about conflating one's epistemic worth with perception of status, power, or the devaluation of others', and more about a conscious refusal to sincerely consider ideas that conflict with one's own. Madsen (2020) suggests that "...inflating the epistemic worth of one's view is not sufficient for arrogance." (p.3). For Madsen, one can make an honest mistake and is arrogant only when the incorrect assessment of epistemic worth is maintained after being shown evidence to the contrary, which implies a conscious decision to ignore such evidence. Wright (2018) suggests that a lack of critical feedback (including self-reflection) can lead to epistemic arrogance when agents isolate themselves from such feedback. Parviaien & Lahikoaien (2019) offer a strong distinction between confidence in one's knowledge and belief and epistemic arrogance, especially when the confidence is supported by legitimate expertise in some field. In this case, even when there is a sense of confidence, power, and privilege, as enjoyed by experts, their refusal to consider competing epistemologies is not deemed arrogant because experts will often acknowledge the limits of their expertise and their confidence, power, and privilege is predicated on the legitimizing character of their education and expertise. Epistemic arrogance, for these scholars, is predicated on an agent's refusal to consider legitimate challenges to one's knowledge and beliefs, where such challenges are consistent with the agent's broader epistemic understanding. In other words, regardless of the agent's valuation of themselves as agents (epistemic or otherwise), arrogance stems from the agent consciously ignoring information that they logically ought to consider.

In either case, the charge of epistemic arrogance as a vice implies a lack of awareness of one's epistemic fallibility where this lack of awareness is predicated on notions of superiority and/or on an illegitimate refusal to consider conflicting viewpoints. Epistemic humility, on the other hand, implies not only an acknowledgement of the fallibility of one's own knowledge and beliefs, but also an active attempt to improve one's knowledge and beliefs. Kwong (2015) outlines how open-mindedness is a key element of the self-reflective character of an agent seeking to combat epistemic injustice, connecting to the idea that one is obligated to attempt to improve their own viewpoint when they acknowledge that it could be improved. De Bruin (2013) makes the case that a virtuous removal of obstacles in thinking expressed as biases requires an improvement of one's epistemic framing, implying that merely identifying the possibility of being wrong is insufficient to qualify as virtue. The behavioural element of improving ones'

epistemic frameworks is discussed by Wright (2018), who shows how intellectual virtues require an extension beyond just beliefs. Lynch (2018a) discusses how listening to alternative viewpoints is insufficient; one must also recognize that their own viewpoints could be improved through such listening. Acknowledgement of epistemic fallibility, therefore, is not virtuous unless it is accompanied by a sincere attempt to improve the postulated defects in knowledge and belief.

Responsibility, Charging, and Pitfalls

The literature reviewed provides some suggestions as to individuals' degree of responsibility or culpability for their epistemic virtuousness or viciousness (Kidd, 2016). Kidd has asked whether personal history or the non-ideal nature of the world should bear against a charge of epistemic arrogance, suggesting that appropriate circumstances in one's background may be required for epistemically virtuous behaviour. Further, Kidd as well as Fricker (2007) have outlined the concept of epistemic ecology and socialization to characterize the degree to which one's background may have influenced epistemically vicious outlooks and behaviours. Baird & Calvard (2018) have suggested that one must consider the types of obstacles individuals face in adopting epistemically virtuous traits when making charges of epistemic arrogance. Depending upon one's background, therefore, an individual's inherent epistemic viciousness may derive from their epistemic environment. Despite this, the cultivation of virtue is still seen as the responsibility of the individual when in communication with others' ideas.

The testing and cultivation of one's epistemic virtue necessarily comes about in the context of a difference of opinion. The ability of two or more individuals to effectively communicate and debate differing ideas will depend on the degree to which these ideas are framed in compatible ways. Ashton (2019) has claimed that two agents in debate must have at least some common ground in order to be able to communicate. May (2014) has made the case that where epistemic frameworks or worldviews are misaligned, it can be a considerable challenge to transfer knowledge across these divides. In addition to different epistemic frameworks, privilege and power may impact individuals' ability to perceive their counterpart as someone from whom they can learn, and thus "...epistemic and material privileges intertwine and can impede [this] perception" (May, 2014, p. 98). Baird & Calvard (2018) support this notion with the concept of epistemic hubris, where privilege and pride influence convictions of infallibility and superiority over others, echoing definitions of epistemic arrogance from Tanessini (2016) and others described above. The challenge in real debate is that the required common epistemic framing and/or acknowledgement of one's opponent's epistemic worth may be absent when most needed (Kidd, 2016). Part of epistemic ethics, therefore, requires that the individuals in debate identify at which level of understanding (issue itself or the overriding framework) they are debating, and to consider their shared understanding in establishing an effective basis for that debate.

When there is an inability to agree, one party may charge another with epistemic viciousness as a means of identifying or explaining their recalcitrance. Kidd (2016) defines such epistemic vice-charging as 'calling out', which means the individual's attitude or behaviour (epistemic arrogance, for example) is being identified as problematic in reaching a common understanding. Mignolo (2009) provides an example of epistemic vice-charging when calling into question the conduct of the Harvard International Review in their suggestions for what a group of Maori in New Zealand need to improve their economic conditions. Such a charge is based on the claim that the US-based Harvard International Review experts believe they know better than the Maori themselves what should be done, which Mignolo suggests is epistemically arrogant. Dreher (2018) cautions against behaviour like that of the Harvard International

Review in stating that “we can disagree with others about how best to live and what to value, but that disagreement must be tempered by the confession that nothing is so certain that it can be justifiably forced upon others." (p.16). It is important, however, that charging of epistemic arrogance is not made solely on the basis of a difference of opinion. It is the conduct and attitude in the face of that difference that will support such a charge. In other words, the legitimacy of a charge of epistemic arrogance will depend both on the behaviour of the parties involved as well as on the degree of incompatibility among the expressed epistemic frames.

Desirability of Epistemic Humility

If the concepts of epistemic humility and arrogance are sufficiently understood, it is important to advance a premise as to why epistemic humility (and virtues in general) is desirable over epistemic arrogance (and vices in general). A benefit of adopting epistemic humility and curtailing epistemic arrogance is to limit epistemic wrongs done to others and the self (Fricker, 2007). Kwong (2015) defines epistemic injustice as wrong done to an individual because of their status as a knower. When someone is treated as inferior because of such status, any knowledge they attempt to share will also be diminished (Fricker, 2007). Such testimonial injustice may prevent individuals from fully developing their personal identities (Wright, 2018). When people believe they will not be listened to, they will stop sharing, and will have been silenced, often against their will (Manson, 2020). Goldberg (2016) describes how the lack of response from those silenced is often interpreted as assent for what was said. The silenced experience epistemic injustice and oppression since “..the very silence of those who are the victims of the oppression and subordination is itself standardly interpreted as further evidence for the warrantedness of the way these victims are being treated.” (Goldberg, 2016, p.96). As a result, the epistemically arrogant may believe themselves more correct than warranted since their silencing of others prevents them from learning where they might be wrong. Tanesini (2016) describes how “...arrogance produces ignorance by silencing others” (p.72) in two ways; by silencing others, and by fostering self-delusion in the arrogant themselves.

Lynch (2018) describes four specific harms that result from epistemic arrogance, which are i) diminished participation by those harmed, ii) minimization of mutual accountability in discourse, iii) undermining of trust in others (as there is a greater focus on self-esteem than the truth), and iv) undermining the value of truth itself. This has obvious links to epistemic injustice and silencing described above. The actual manifestation of epistemic arrogance that gives rise to such harms can “...include talking over other people, interrupting them, putting them down in public, ignoring or rejecting without reasons what they may have said, and conveying to one’s audience the impression that one thinks oneself as cleverer, smarter or more quick-witted than them.” (Tanesisi, 2016, p. 73-74). Baird & Calvard (2018) present the idea that such behaviours described by Tanesini could be intentional, when there is a disregard for evidence, or unintentional, when there is a misalignment of social structures or a lack of cultural understanding. Regardless of the intentions of those who commit arrogant behaviours, the wrongs are real and may limit the potential for mutual understanding and for learning. Applying epistemic humility to combat such harms is part of the “negative moral task” (Buchanan, 2009, p.280) in attempting to reduce or avoid the worst behaviours.

In addition to avoiding the various wrongs discussed above, another reason for the desirability of epistemic virtues, and humility in particular, is the practical benefits derived thereby for problem solving and for the pursuit of innovation. Two key components to innovation and problem solving include the

complete realm of human knowledge as well as the ways in which that knowledge is corrected and expanded over time (Kline & Rosenberg, 1986). Kline & Rosenberg also discuss how unknowns are critical within innovation, an idea echoed by Parviainen & Lahikoaien (2019) who state that negative knowledge and uncertainty can fuel problem solving if not certainty. In order to capture this benefit, however, those involved must be not only open to these ideas, but to actively seek them out, which in some domains where the dominant frameworks of knowing may be challenged, means "...receptivity and a willingness to grant conceivability to the seemingly implausible." (May, 2014, p. 106). Maintaining an open mind and actively seeking out new information (more or less the definition of epistemic humility) is a key ingredient in effective problem solving, design, and innovation.

Undesirability of Epistemic Humility

In contrast to the benefits of epistemic humility outlined above, the literature also presents some cautions. While there is general agreement that open-mindedness and a love of learning are characteristics to be strongly fostered in everyone, there are some pitfalls where individuals may be exploited or taken advantage of as a result of their humility. Perhaps the most obvious downside to epistemic humility is in a situation of debate where admitting the limits of one's knowledge and beliefs may be taken as evidence of the inadequacy of that knowledge or those beliefs. Parviainen & Lahikoaien (2019) describe how an expert's acknowledgement of their negative knowledge (i.e., what they do not know) may be taken as evidence that the expert's testimony is unreliable, particularly in our current 'post-truth' paradigm. They add further that "it would be hubristic or dishonest for [an expert] to claim complete and absolute certainty" (p.3884), even if that humility would undermine their credibility as an expert. It is important to consider the audience to avoid epistemic humility being interpreted as a lack of expertise. In the words of Lynch (2019), an expert must ask "How can I be open to the possibility of being wrong while still maintaining strong conviction?" (p.13).

A significant ethical concern is thereby created, however, since the inherent uncertainty of even commonly accepted truths demonstrates the lack of an absolute authority on knowledge. Lack of conviction or recognition of uncertainty (i.e., epistemic humility) can undermine the legitimate action of authority. This may manifest in extreme postmodernism, as epistemic vices may be hidden as virtues when "saying, meaning, and doing are decoupled." (Baird & Calvard, 2018, p. 273). Lynch (2017) describes how postmodernism started as a challenge to objectivity but has now been "...taken further to encourage complete and often incoherent rejection of the idea that anything is true (except, apparently, the rejection itself)." (p. B11). At some level, a common frame of understanding must apply, upon which an expert can stand and offer knowledge, while not being undermined by appropriate expressions of doubt. An understanding of what constitutes truth must be "based on sound reasoning and reliable evidence." (Faulkner et al. 2017, p. 1282). Where a common frame of understanding cannot be found, as stated above, there may be an irreconcilable disagreement where the basis of legitimacy cannot be agreed upon.

On this point, it is important to consider how the literature addresses religious freedom in the context of epistemic ethics. True religious belief depends on what de Bruin (2013) terms belief perseverance, where the belief persists in the face of targeted challenges. Manson (2009), in a response to the work of Buchanan (2009) describes how religious beliefs may act as an obstacle to true belief. Dormandy (2018) describes how one must make a choice of exclusivity either with epistemic humility or with true belief. Characteristics of epistemic arrogance offered by Lynch (2018a) include being dogmatic and close-minded to alternative views. Dormandy (2018) defines dogma as strong confidence

and unwavering commitment to one's beliefs in the face of contrary evidence, and that dogma serves as protection for religious belief against evidence. Religious belief, therefore, must be considered part of epistemic arrogance, since it requires choosing religious knowledge over alternative ways of understanding the world, such as those offered by scientific methodologies. Carter (2009) states "...it is difficult to see how religious institutions could, on balance, display greater epistemic virtue than vice." (p.304), noting now epistemic humility would require challenging the basis of religious thought, in direct contravention of faith. Unfortunately, the literature reviewed does not provide a clear answer, since a scientific evidence-based approach to legitimacy is diametrically opposed to a faith-based legitimacy. The preservation of religious and other freedoms may stand as a necessary exception to the application of epistemic humility in pertinent areas.

Fostering Epistemic Humility

The literature reviewed suggests that epistemic humility enables us to avoid harms, improve our understanding of the world, and enhance problem-solving and innovation. What seems to be absent, however, is a robust framework for how exactly it can be fostered, especially where current behaviour may tend toward epistemic arrogance. What does emerge, however, is a number of ideas offered as a means of making better decisions, avoiding bias, or attempting to work with uncertainty. The ideas summarized below are not an exhaustive list, but rather offered for illustrative purposes as ideas for improving individual's or group's epistemologies that also include the idea of epistemic humility either intrinsically or peripherally.

To overcome bias, currently held beliefs are challenged by "...asking individuals to consider the opposite." (Battaglio et al., 2019, p. 306-307). Kahneman (2013) explains a cognitive model of the brain that operates in two ways, System 1 and System 2, to explain how decisions are made based on emotional and rational processes, respectively, which provides additional context for how bias can slowly be overcome. Thaler & Sunstein (2008) take a slightly different approach with their idea of Libertarian Paternalism where users of services, for example, are 'nudged' to select options that are deemed beneficial for them, but where their free choice is not curtailed, and which takes advantage of natural biases within such individuals or the systems with which they interact.

Ashton (2019) outlines benefits and challenges to relativism as an epistemological approach and offers Stratified Epistemic Relativism as a framework that can be used to better understand the world. Specifically, the four non-hierarchical strata (Pursuit Frameworks, Community Frameworks, Identity Frameworks, and Rational Frameworks) offer a means of enabling the individual to be critical of their own epistemic frame as well as to develop intellectual (epistemic) humility, especially when encountering other epistemic frames.

De Bruin (2013) offers Epistemic Temperance, wherein an individual will not adopt a belief when there is only minimal evidence. This is closely related to adopting evidential epistemologies, which "...helps combat intellectual arrogance." (Lynch, 2017, p. B11). The use of evidence, however, can be challenging depending upon the state of mind of the individual in question (Madsen, 2020).

The Precautionary Principle was presented in Section 3. While not a robust strategy for fostering epistemic humility, it does contain within it the idea some caution, or humility, is warranted when making decisions involving significant risk and uncertainty.

Taleb (2012 and 2018) presents the idea that there is an ethical obligation for a proponent of an activity to have 'skin in the game', or to share in the risk of their initiatives. The idea is that if a proponent does not share in the risk of their initiative, they do not suffer personally if the initiative fails. For change agents, the idea would extend to bearing some risk when proposing or acting to create change. For Taleb, having skin in the game means accepting some risk and fosters a greater degree of caution along with a desire to minimize risk. Having skin in the game keeps hubris in check and reduces loyalty to ideas. In other words, having skin in the game fosters epistemic humility as one seeks to minimize the risk of their initiatives through greater understanding and knowledge.

Finally, the entire field of Systems Thinking is offered as a way of structuring knowledge that actively seeks to identify interactions and uncover or address uncertainty. Senge (2006) describes the model of the Learning Organization as an application of systems thinking to how organizations and the individuals within them can better learn and thrive. The Learning Organization is essentially a way of fostering epistemic humility. Similarly, Dalio (2017) provides an applied rubric of 'extreme honesty' and 'extreme open-mindedness' as part of his Principles for effectively running his business. Such extreme honesty can be considered another phrasing of epistemic humility, since the honesty in question is directed at the self and others to better understand how others see the world as well as to provide a shared and objective way of assessing how decisions should be made.

Perhaps a key takeaway from these examples is that there is academic and practical value for epistemic humility in its various forms, and that epistemic arrogance can hamper individual's and group's efforts to effect positive change in the world. However, the notion that one can foster epistemic humility in others may depend on the receptivity of the target. Self-deception is described by Manson (2020) as an epistemic failing. Lynch (2018) describes how mutual trust is required in order to foster communication. Ashton (2019) warns that we may be blinded by our deepest beliefs. Epistemic humility depends on being open to the idea that our knowledge can be improved. If we have deceived ourselves about the truth of our deepest beliefs and are distrustful of alternative ways of knowing, the seed of humility may not land on fertile soil. Fostering epistemic humility where arrogance currently thrives is a real challenge, since it seems that epistemic humility is required to see more epistemic humility.

5 Interviews

Now we explore how practitioners of change understand their work. Seven participants agreed to be interviewed for this study and provided their perspective on uncertainty, change, and on their own ethical framework. This section outlines the structure of the interviews and provides a summary of findings.

Interview Methodology

Following approval from the Research Ethics Board (REB), an email was sent to the Strategic Foresight & Innovation (SFI) google group to invite interested people to participate in an interview and subsequent workshop. The email requested that recipients consider themselves as well as others beyond the SFI group as possible participants. The email provided a link to a longer description of the study that included an outline of the risks and the benefits of participating. The email also provided a link to a screening form to determine participants' eligibility. The screening form asked if potential participants identified as agents of change or innovators and requested them to indicate whether they were interested in participating in just an interview or in both an interview and the workshop (refer to Section 6). Once participants were successfully screened, they were sent a consent form by email. When the signed consent form was returned, interviews were scheduled. A total of seven interviews were held between October 9 and November 1, 2021 and included participants from the SFI program (current students and alumni) as well as two who were not part of the SFI program.

Interviews were held to better understand how participants understood themselves as change agents or innovators, how they dealt with the inherent uncertainty in their work, and what ethical framing they brought to their work. To avoid leading questions, the interviews were conducted in a semi-structured format with some open-ended questions to initiate and guide the discussion. The interview questions were not followed in linear sequence but were interspersed throughout the interviews based on what participants offered, with the goal of covering the various topics, but in a conversational way. Interviews were intended to last one hour, and generally kept to that duration. The complete list of questions can be found in Appendix A. The interview began with a brief introduction to the study, a summary of the Research and Ethics Board requirements, then the same opening question. Each participant was asked to provide an explanation of how they identify as an agent of change or an innovator and what they consider to be their area of influence. Participants were asked to consider the words 'agent of change' and 'innovator' loosely, and to provide their own language to describe what they do.

Interview Findings

All seven participants work in different sectors or industries and brought a different take on what it means to be an agent of change. The first question asked participants to provide a summary of how innovation and change figures in their work, what their area of focus is, and how they see themselves as change agents. Approximately half of participants identified their roles with a title of some kind, whereas the other half described what they did without the identification of a title. One participant was emphatic about purposefully eschewing titles as being too limiting and uncomfortable. All participants, however, were quickly able to describe how their work involves change, and how they pursue innovation or change. Participants' area of focus included for-profit and not-for-profit organizations, social innovation, technology, business, and government. Some were focused on social-scale fields of change and are

working with broad environmental and social justice issues, whereas others' innovation efforts were focused within one or more organizations in both the public and private sector. Some identified their change efforts as being focused on the level of individuals within a larger context, noting that change efforts often must target individual people. After participants introduced themselves and their area of focus, the interview continued with clarifying questions and answers and questions from the list (refer to Appendix A).

Interviews were recorded and the interviewer took detailed notes in each interview. The findings have been gathered by theme and are presented below. Each theme has a title, a brief description, and point-form summaries of the ideas shared by participants. Most themes include contributions from all seven participants. Themes are either related to the questions used by the interviewer or emerged through the course of interviews. The findings are as follows:

Characteristics of a Successful Agent of Change: Once participants' roles and areas of focus were elaborated, they were asked what personal characteristics made them and others in similar roles effective or successful in their pursuits.

- Being humble and lacking ego, and having an understanding that the change isn't about the change agent, but about stakeholders and the overall objective
- Curiosity and open-mindedness when approaching the goals of their work
- Empathy for stakeholders
- Bravery relative to personal risk, as some change initiatives will challenge the existing power structures and systems
- Strong belief in the need for the proposed change or innovation and in the likelihood of success
- Being a student, not an architect

Change Agent with Epistemic Humility: Every participant's description of successful change agent's characteristics included ideas strongly related to epistemic humility. They were asked to expand upon how openness and a love of learning figure in their work. In some cases, the term 'epistemic humility' had been defined at this point, whereas other interviews discussed the same ideas prior to defining the term itself.

- Epistemic humility should be the 'core' of a change agent's work
- Being better at listening to others leads to better outcomes for everyone
- Change agents should try to learn from others
- Showing epistemic humility is essential to developing solutions that align with the largest number of needs
- Organizations can model themselves off Peter Senge's 'Learning Organization' (refer to Senge, 2006)

- Those implementing change projects need both experimental data and life experiences, for which epistemic humility is critical
- Change initiatives need to include mechanisms of change within themselves to accommodate new information gained through the implementation of the initiative. It is critical that change management programs be conducted in such a way as to adapt to a changing understanding of the overall project
- Epistemic humility is important but shouldn't stifle conflict, as significant learning and innovation can come from conflict. Innovators should not encourage humility to the extent that everyone defers to others and stops offering or advancing their own views and ideas

Uncertainty: Participants provided comments regarding how uncertainty figures in their ability to act as innovators or agents of change. Uncertainty was understood to mean both areas where the agents themselves did not have knowledge, as well as the uncertainty associated with the behaviour of complex social and other systems.

- There is always uncertainty about the basis of change and about the anticipated or desired outcomes
- Uncertainty will always exist, so people need to find ways to accept ambiguity in their work, especially if they work to foster and guide innovation
- Need to experiment and accept failure and learning along the way
- There is a dichotomy between having enough confidence to lead change but also to acknowledge limits of knowledge so that learning and adjustments can take place along the way
- Need for change agents to look for discontinuities between what people say and what they do, as this is where uncertainty may be disguised as what is believed to be understood but may not be
- Uncertainty is usually acceptable to people as long as it is within certain bounds. People may be comfortable with some ambiguity or uncertainty, but they need some certainty in their lives, or they will be anxious and fearful
- Uncertainty can be beneficial for fostering innovation

Missing Knowledge and Errors: Some participants talked about how missing information remains missing despite being generally available. Efforts can be made to remove or reduce uncertainty, but it may be impossible for some to obtain certain kinds of knowledge due to various human factors such as their personal background, cultural divides, personal obstinacy, and language barriers.

- Some people may not be self-reflective and may not understand the limits of their knowledge
- Fear or lack of comfort on some topics may prevent individuals or organizations from exploring issues that, if pursued, would expand their knowledge

- Failures in communication, both in the sending and receiving of information, as well as how communication is conceptualized may limit knowledge transfer
- Identification of self with certain beliefs and the exclusion of the consideration of other ideas (refer to Identity vs Ideas, below)

Epistemic Humility and Arrogance: The terms Epistemic Humility and Epistemic Arrogance were shared with participants. Some were slightly familiar with the terms, but all participants indicated a need to have the terms defined. Once defined (using the definitions identified in Sections 2 and 4), however, all participants understood the ideas and used the terms through the rest of the interview.

- No one can have perfect knowledge, so the ability to understand the limits, even just conceptually, is seen as desirable, and having a name for the concept is useful
- Epistemic humility should be 'rebranded' to make the idea more easily adopted and to sound less academic
- Epistemic arrogance may stem from authority, preference for one's own discipline or area of practice, or from biases (confirmation bias was mentioned in several interviews)
- The idea that open-mindedness may be learned and that one's background may influence whether an individual will recognize the limits to their knowledge, or be able to show epistemic humility
- Epistemic humility and arrogance are on a continuum and not discrete ideas
- There was general agreement that epistemic humility is highly desirable, but also that, in some cases, epistemic arrogance might be warranted, to avoid some of the limitations with epistemic humility (see the next theme)

Limitations of the Idea of Epistemic Humility: In some cases, limitations of epistemic humility were identified by participants. In other cases, participants were asked if they believed the concept of epistemic humility has inherent limitations. Although there was some conflation of non-epistemic and epistemic humility, in general all participants indicated that there are some important caveats to the application of epistemic humility. All participants seemed to believe that, despite these limitations, epistemic humility is a desirable trait.

- Showing too much epistemic humility could lead others to doubt the agent's confidence in their knowledge
- Evidence should be used as a basis of knowledge, so humility contrary to the evidence should be avoided. Too much humility in these cases might 'slow down' progress in implementing certain initiatives
- Epistemic humility, especially in a political context, may enable others to maliciously twist ideas away from what was clearly intended in self-serving ways

- If there were equal access to knowledge and no political manipulation, there would be no downsides to epistemic humility
- People in positions of authority have an inherent need to appear confident. Experts' reputation can be damaged by a lack of confidence. Changing one's mind in light of new information seen as more reliable can likewise damage authorities' reputations
- Epistemic humility for its own sake was seen to be an aberration for one participant. For them, epistemic humility should serve a purpose in improving knowledge, engaging stakeholders, building consensus, etc.

Identity vs Ideas: Some participants noted that an individual's identity correlates to the ideas and knowledge they hold to be true. The degree to which an individual can separate their ideas from their identity and hold conflicting notions for evaluative purposes was discussed in several of the interviews and seems to correlate with the degree of epistemic humility or arrogance an individual will manifest.

- How individuals understand the Covid 19 Pandemic may depend upon the type of work they do and how they identify with that work. 'White collar' workers were able to continue working remotely, whereas 'blue collar' workers needed to work in-person.
- An individual's identity evolves over time, as does the knowledge they hold
- When effecting change, the agent needs to 'meet people where they are' and communicate in ways that are accessible to stakeholders
- Pace and format of interactions can influence whether people's identification with their knowledge frameworks will work against the agent's desire to share knowledge or different perspectives

Ethics: Participants were asked about how they understood any ethical obligations they might have when working toward change or pursuing innovation. The question was carefully crafted in an attempt to avoid limiting the context participants would apply in answering the question. Some participants asked for a definition of ethics, whereas others had varying degrees of understanding about what ethics meant. A general, broad definition of ethics applied in the interview included notions of fair dealings, right and wrong, moral conduct, and what ought to be done. Some participants expressed that they had not considered in an explicit manner the ethical basis of their work but were quick to identify how right and wrong play strongly into their conduct.

- Agents of change need to consider all the stakeholders likely to be impacted by a change
- Challenge of applying a scientific formulation of knowledge accumulation as compared to the more holistic tools taught in SFI, which were seen as less systematic, robust, and rigorous, since they may not be repeatable
- Role of a consultant as one being paid to provide guidance or 'an answer'. There is an ethical dilemma of appearing as an expert while being open to learning

- Ethical dilemma of doing what one was instructed to do by a boss, employer, or client as compared to challenging the instructions to consider a broader range of stakeholder needs
- Preference for the term 'morality' over 'ethics'

Questioning Change Efforts: This theme was discussed in several but not all of the interviews. Participants offered their perspective on how an innovator or change agent might be self-reflective about whether the change should be implemented at all, or if they question the initiative either at the outset or during the change. Some participants who were asked about this suggested that the change itself was usually set and they were charged with implementing it, not questioning if it should be done at all.

- Change is often locked-in and the change management process may not allow for flexibility
- Communication among stakeholders may limit their ability to collaborate and provide novel information to the innovator. Adjustments to the change initiative cannot take advantage of this information
- In some cases, if the change presents a significant challenge to an organization, it may be stopped rather than modified to accommodate stakeholder needs, as resistance to a change may cause the change to be cancelled outright rather than trying to work with the stakeholders and their concerns
- Change initiative may be connected to a specific individual in an organization. If they leave, the initiative may stop
- Change agents may have a duty to question what they are being asked to do, but the power dynamics from bosses or clients may limit their ability to effectively challenge the concept

Fostering Epistemic Humility: All participants expressed a general preference for epistemic humility, with some caveats. Participants were asked how they felt epistemic humility could be fostered either in themselves, among change agents and innovators in general, and within organizations, groups, and the population at large.

- Fostering epistemic humility will require work on the reward structures in education and in general to reward open-mindedness
- Need to teach children to be open and see every interaction as an opportunity to learn
- It is important to put a strong focus on evidence to bolster ideas that are supported by the evidence and to challenge ideas that are not
- It is important to find similarities and common ground with others before working on areas of conflict and disagreement
- Should focus on stories, which can communicate more nuance and show how knowledge is not absolute

- It is better to ask questions than to make statements
- People should try to combine their knowledge with others and have shared responsibility instead of single points of responsibility
- Approach interactions with a co-learning mindset where all parties are trying to figure something out together
- Value both lived experience and expertise

Limits to the Ability to Foster Epistemic Humility: Participants were not asked directly what they felt were the barriers to fostering epistemic humility in themselves or others. These ideas emerged throughout the interviews, and especially when asked how epistemic humility could be fostered. The focus went quickly to what made epistemic humility difficult either for the participants themselves, or as imagined for people in general.

- The focus on grades in the education system creates a fear of failure and of not having the 'right answer', which makes epistemic humility much more challenging. The idea of right vs wrong is an oversimplification
- A bias to quantifiable and scientific knowledge may make people less open to other ways of knowing
- Excessive hierarchy in organizations may stifle people's ability to learn from one another
- New approaches need to be found to balance being inclusive and open-minded while remaining aware of the pragmatic need to advance projects
- Town hall-style meetings present a microcosm of epistemic conflict, as each party may be present for different purposes that aren't explored, and there is a limit to how knowledge from each party can become salient in that format
- Living with challenging circumstances can foster epistemic humility and the absence of such circumstances can limit it. For example, teachers who have not failed in school may not understand failure, whereas teachers who did fail, and subsequently overcame those failures may be more open to the perspectives of students who are failing and better understand how they see the world. Their epistemic humility will likely make them more effective teachers

Participants offered a rich ensemble of ideas related to how they, as agents of change and as innovators, operate in their complex real-world areas of interest. Although they were generally not familiar with the term 'epistemic humility' before the interviews, they all identified learning and listening as key requirements in their work and seem to value and embody the virtue of epistemic humility. Next, we consider the foresight workshop where participants worked together to identify additional ideas related to how they approach their work.

6 Foresight Workshop

A foresight workshop was included as part of the study to explore ways practitioners of change felt that epistemic humility could be fostered and how it might impact decisions regarding what changes to pursue. The literature reviewed did contain some suggestions, and interview participants offered ideas as well. The purpose of the workshop was to encourage a collaborative discussion among practitioners from different sectors to see what could be better understood. Further, an element of foresight work was incorporated to compare present conditions to what the participants might envision in the future.

Workshop Methodology

The workshop was framed around the Three Horizons futures method. The original Three Horizons model was described in a book published in 1999 called *The Alchemy of Growth* by Merhdad Baghai, Stephen Coley, and David While, and was further developed by Bill Sharpe and Anthony Hodgson as part of a foresight project for the United Kingdom government (Curry & Hodgson, 2008). The Three Horizons model provides a framework to consider the current state of an area of interest (Horizon 1), a desired future state (Horizon 3), and an intermediary state (Horizon 2) through which we must pass from Horizon 1 to Horizon 3 (Curry & Hodgson, 2008). The Three Horizons model is represented graphically as three curves plotted on a two-dimensional cartesian plane, where the x-axis represents linear time and the y-axis represents the degree of strategic fit or prevalence of competing worldviews, as shown in Figure 4.

Since Horizon 1 is the present, conceptions of Horizon 2 and 3 are possible futures and require participants to imagine what is desired and what might occur in the future. The goal is not to predict, but

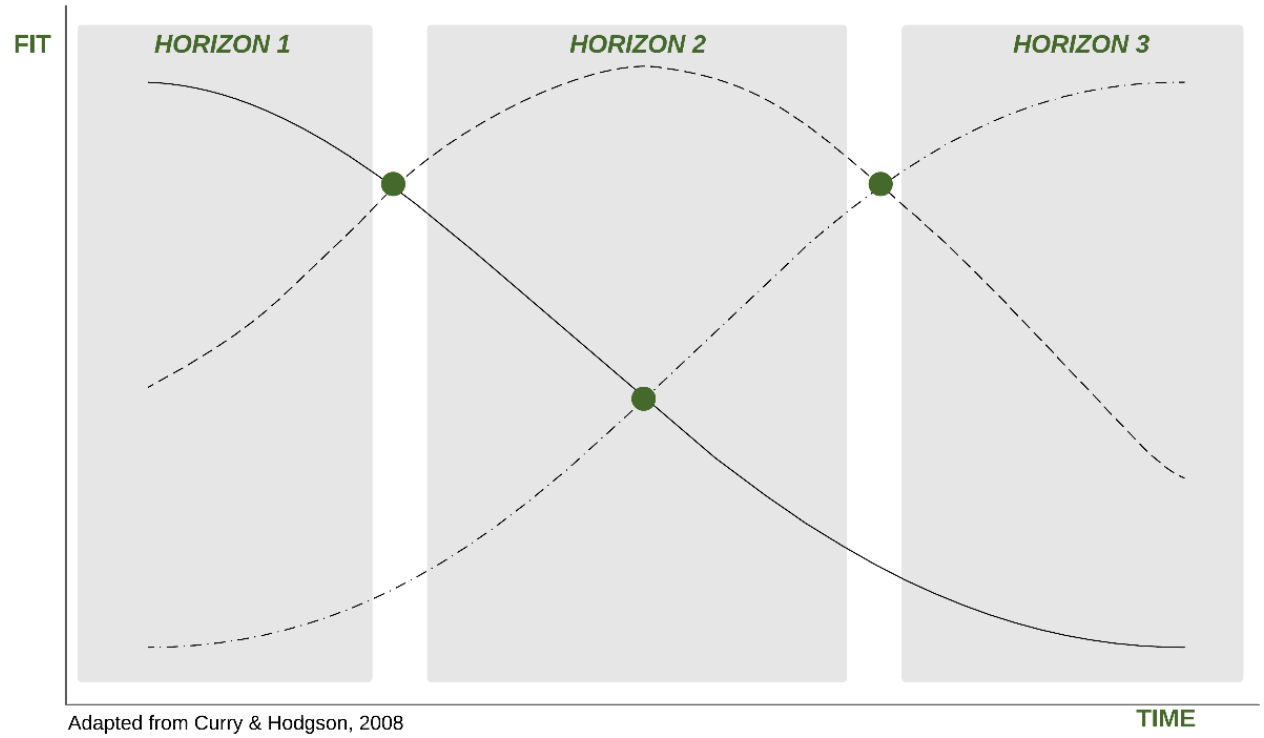

Figure 4 - Three Horizons Model

to explore. The three curves each have a maximum in a separate horizon (the solid line in Horizon 1, the dashed line in Horizon 2, and the dot-dashed line in Horizon 3) and represent the dominant characteristics occurring in that horizon. All three curves are still present in each horizon, however, and suggest that there are elements of different and possibly competing worldviews or paradigms present in each horizon, though one in particular dominates. Between Horizons 1 and 2 and between Horizons 2 and 3, the curves intersect indicating a change of regime between what paradigm or worldview is dominant.

Hodgson & Sharpe (2007) provide a useful description of the types of mindsets that participants should consider when envisioning the dominant worldviews of each horizon. These are summarized as follows:

Horizon 1: This is the current worldview or paradigm. Mindsets for change in this horizon will involve a "continuation and extension of the current societal systems that define our culture…" (Hodgson & Sharpe, 2007, p.137).

Horizon 2: This horizon represents an extension beyond the incremental changes envisioned in Horizon 1, and is described as "entrepreneurial" and "seeks to harness [potentials for change] to introduce something new to the world…" (Hodgson & Sharpe, 2007, p.139). Horizon 2 remains grounded in a more rational expression of the future, in comparison to Horizon 3, and may be based largely on peer-reviewed scientific research (Sharpe & Hodgson, 2006).

Horizon 3: Horizon 3 represents futures that are aspirational, based on participants' visions of a desirable future. It is based on "...values and beliefs that… have a better fit with the future." (Hodgson & Sharpe, 2007, p.139). In contrast with Horizon 2, Horizon 3 may be more focused on stories and the meaning behind them.

Structure of the Workshop

Of the seven interview participants, five indicated an interest in participating in the workshop as part of the study screening. Based on alignment of mutual availability, and partly due to tight timelines to conduct the study within one semester, only three of the five participants could be available at the same time to partake in the workshop. The workshop was held on November 4th, 2021 with the three participants and the author and had a duration of two hours. The workshop started with a brief introduction and orientation to the study and a reiteration of the Research and Ethics Board requirements. Next, the participants were provided with a brief introduction to the Three Horizons Model and a primer on the use of the collaborative Mural.co board that was used for the workshop. A formatted copy of the final mural board is provided below in Figure 5.

The workshop itself began with participants populating the Horizon 1 with 'sticky notes' providing ideas related to how they understand their own relationship to their knowledge, and how that knowledge influences their ability to make good decisions. Participants were asked to consider how they understood their knowledge relative to any uncertainty and the need to act within their areas of influence. Participants were provided with approximately ten minutes to contribute to the mural. A discussion was then held for about 45 minutes to discuss some of the contributions as a group. Next, participants were provided with another ten minutes to populate the Horizon 3 section with how they would like to interact with knowledge and ways of knowing in the future, and how those interactions might enable better decision-making and self-reflection about the desirability of a given change or innovation. The Three Horizons model usually stipulates a timeline for Horizon 3. The timeline for Horizon

3 was omitted for this workshop because of the varied areas of focus for the participants. Leaving the timing of Horizon 3 open enabled greater flexibility for imagining a desired way of interacting with our knowledge. After the participants were done adding 'sticky notes', four were selected for group discussion, which lasted approximately 35 minutes. Unfortunately, there was insufficient time to consider Horizon 2 in the workshop, and that stage was omitted. Figure 5 shows the formatted contributions to the mural board.

Workshop Findings

Three of the ideas shared in Horizon 1 and four from Horizon 3 were discussed by the participants. Because of the time constraint, the discussion of Horizon 3 was cut off earlier than might have been ideal, and Horizon 2 was not covered at all, although some notions of Horizon 2 were evident in the discussion of Horizons 1 and 3. Themes all pertain to how participants do or would like to relate to their own knowledge and how they would like others to relate to their own knowledge. A summary of the themes and discussion is as follows:

Horizon 1 - When I feel my body and mind are connected: This theme explored how feelings in the body and emotional feelings may provide information that rational thought may not. Participants connected felt senses and the knowledge associated with those senses with fear, needing to belong, and how their emotional selves can inform their decision-making.

- Being sensitive to how the body is reacting to what is occurring, including wakefulness at night due to stress
- Involuntary bodily functions may mean the brain is misleading the person
- Doubt may come from an emotional feeling rather than from a rational place
- Sometimes need to trust the 'gut' instinct
- Is the Limbic or the rational/cognitive parts of the brain leading or driving a decision
- Students need to feel safe in order to learn
- Are we driven by fear? Bias, categorizing, and rationalizing may be defense mechanisms against uncertainty or complexity
- People have a fear of being judged and may tailor what they share, which will change the experience
- Are people being driven by loneliness? Are they betraying themselves to fit in or betraying their tribe?

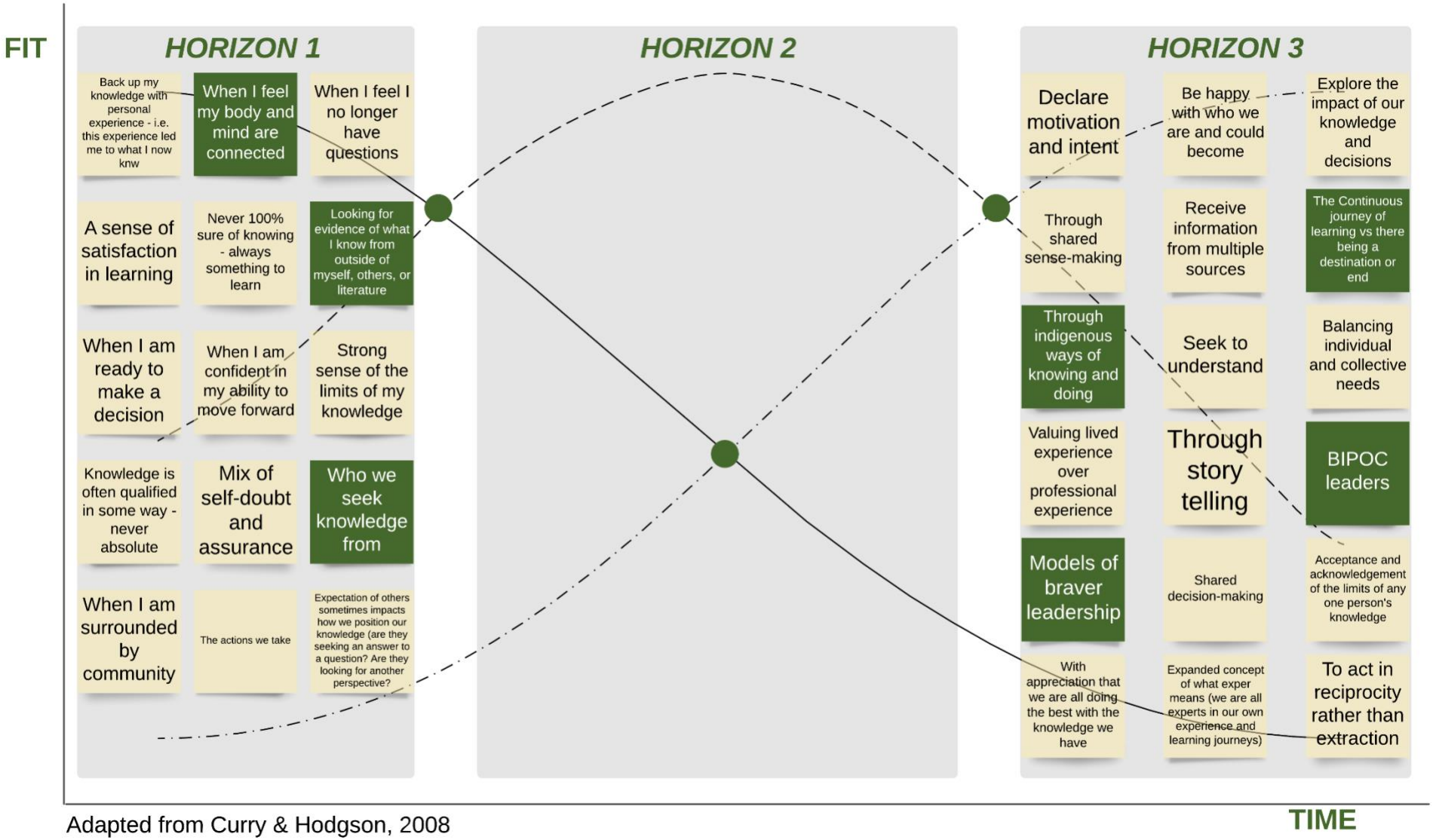

Figure 5 - Populated Three Horizons Mural from the Workshop

Horizon 1 - Looking for evidence of what I know from outside myself, others, or literature: The general idea with this theme is that one's knowledge is improved when it is based on meaningful contributions from a number of diverse sources. This does not make the knowledge, decision, or strategy infallible but does improve the level of confidence one might have.

- Confidence in making decisions improves when corroborated by outside sources
- There is a desire to bring value that depends upon robust understanding
- There is a cost when one changes their mind, since others are depending on what was previously shared and will have to change their own minds or actions
- Politicians, for example, may be challenged when they change their minds, even if people generally understand that strategies should change when new information comes to light
- There is a need to be open and transparent when making changes and to not hide when mistakes are made. Relying on the best available information is important and people need to remember that no one is all-knowing
- There is an expectation that experts and authorities will know more than others but there is a loss of status when they must admit they were mistaken
- People are more comfortable with risk if they have a contingency or backup support or plan

Horizon 1 - Who we seek knowledge from: This theme relates to the sources of knowledge that inform participants' perceptions of the world, which ultimately drives or informs the decisions they make. By being intentional about what experiences and interactions are selected, one can somewhat influence and frame their own knowledge and, thus, how they make decisions.

- We should consider the source of our information, i.e., we should value the information from an expert differently than a non-expert friend
- The source of knowledge can affect how you think and the quality of your knowledge
- There are many factors affecting how we access knowledge. It is important to use the information you have in the best way possible rather than to try to know everything
- Getting information from people similar to you may be comforting but it is also important to get new information from interactions outside of one's comfort zone
- We learn experientially from others through our interactions, not just from what they explicitly tell us
- There is a need to be intentional about seeking opportunities to leave our comfort zones and be mindful about what information is being consumed
- It is difficult to do something one hasn't done before. Imagining new ways can be facilitated through artifacts or experiences that enable the use of all senses (sight, touch, smell, etc.)

Horizon 3 - BIPOC leaders, Brave leaders, and Indigenous ways of doing and knowing: These three ideas were connected by the participants and were discussed together. The participants discussed an idealized future and continually referenced how system-level change would be required (in Horizon 2) to jump from the current paradigm to one with more BIPOC leaders and one where bravery is modeled by such leaders. Indigenous way of knowing and doing connected strongly with the idea of wisdom and relational knowing compared to absolutes.

- Leaders with different backgrounds can enable the consideration of different narratives and worldviews and what kinds of knowledge are mobilized in making decisions
- Can consider unilateral decisions or decisions made collaboratively
- BIPOC leaders may have fewer models of leaders to emulate and thus such leaders may struggle with forging a new path
- The existing systems will need to change to give rise to this Horizon 3 future
- Bravery in this vision of the future includes more collaboration and less concern with being wrong
- Greater emphasis on care and less on absolute authority
- There is a need to be more in touch with emotions and brave leaders will recognize empathy as a valuable characteristic, one that may not be accessible to an increasing presence of Artificial Intelligence in day-to-day life and in politics
- The future of leadership will require letting go of attachment to identify, position, etc. and more toward naming emotions and articulating why decisions are being made
- Reconnection with nature and minimization of human impact
- More about wisdom, relational knowing, and emotion

Horizon 3 - The continuing journey of learning vs there being a destination or end: This theme considers an awareness of the limits to knowledge. In the future, knowledge and expertise are considered connections as opposed to fixed and final concepts. Participants expressed some difference of opinion as to the extent of how the nature of expertise might change but all agreed that a less authoritative understanding of knowledge was desirable.

- Learning is continuous and non-final, in contrast to Horizon 1, which is more performative (acquire knowledge (formal education) then, apply it (professional work))
- Need to consider how credentials would work in a future where learning is never-ending
- The notion of reports that are 'final' would erode, since reports are obsolete as soon as published
- Expertise becomes more about facilitation and communication than about holding knowledge
- Valuation of experience over professional expertise

Due to time limitation, the exploration of Horizon 3 was shortened, and Horizon 2 was not explored at all. With additional time, a greater understanding of the participants' vision for Horizon 3 would have emerged. Of more concern is the lack of any exploration of Horizon 2. The purpose of Horizon 2 is to attempt to connect the desired aspirational future (Horizon 3) with what is observed in the present (Horizon 1). The lack of time to explore Horizon 2 means that the links between where we are today and where we hope to get to in the future have not been identified. While a basic premise within the Three Horizons model suggests that elements of Horizon 2 are present in both Horizon 1 and Horizon 3, the impact to this study for the omission of Horizon 2 means that some of the ways of navigating from the present to the future remain unexplored. The findings from the workshop do shed light on how participants understand the present and what they view as a desirable future. Future work that might include Horizon 2 would provide additional information about how participants could conceptualize some of the steps we could take to foster some of the ideas identified in Horizon 3.

7 Discussion

The purpose of this study is to investigate personal justifications for change given the inherent uncertainty of the world. Framing the research question identified two elements that require elaboration; i) the nature of uncertainty, and ii) the nature of an innovator or change agent's ability to work with uncertainty and learn about the world. Relevant literature for each of these was outlined in Sections 3 and 4. Interviews (Section 5) and a workshop (Sections 6) with practitioners of innovation and change yielded additional context for their own justification. This section sets about aligning findings from the literature and the seven study participants' offering (both in the interviews and the workshop) to respond to the research question directly. Specifically, this section discusses the reasons offered by participants for their pursuit of change, their rationale for self-reflexivity, their understanding and engagement with epistemic humility, how they felt epistemic humility can enable better outcomes, and how they address shortcomings in their work. Subsequently, a brief critique of this study itself is offered to provide context for how this work could be extended.

Why Pursue Innovation and Change?

There are many reasons why individuals might take up roles as innovators and agents of change. The most consistent message from the study participants is that their work is done to make the world a better place. Whether through social or environmental initiatives, a focus on equitable futures, or improving how enterprises undertake their work, participants were clear that their focus was to effect positive change within their area of focus. In order to do this, participants were all aligned in their assertion that an agent of change needs to be able to listen well, to learn from diverse sources, and to exercise care and caution in their actions. Although the term 'epistemic humility' was new to most if not all of the participants, the idea behind it was felt to be integral to the work they do. Making the world a better place requires an understanding of the people, systems, and issues at play, and the ability to interact and help figured prominently in participant's descriptions of why they pursue their change.

For some, change is being pursued both to effect positive change and concurrently as a vehicle of learning and exploration with others. While there is recognition that improvements within their area of influence are desired, these participants do not feel it is necessarily their place to dictate the direction. For some, the idea is that stakeholders have the appropriate context for the direction of change and the change agent is there to facilitate movement in that direction. For these participants, there is general consensus that although the agent is at the centre of the change, they should make sincere attempts to de-centre themselves as the primary authority and to provide a platform for others' ideas to guide the change as it evolves. The somewhat open-ended nature of this kind of change presents a challenge since resources and time constraints may work against an agent's ability to engage with stakeholders and to follow their lead.

Conversely, other participants suggest that in some cases the change initiative, once started, cannot be modified. This lack of adaptability makes it difficult or impossible to accommodate information learned along the way. Since the rationale is dictated by others (usually superiors or clients) who, with their own metrics and distance from the project, are uninterested in the outcomes of stakeholder engagement as long as their objectives are met. A participant shared an example where a change initiative to implement new computer software was deemed a resounding success based on the metrics established (budget, schedule, delivery of a software package), but was in complete misalignment with

the needs of those who would use the software. The leader of the change received a promotion, and the software was left with others to attempt to make it work. In some cases, the consultative focus of projects is less about understanding needs and more about educating stakeholders and gaining buy-in. Those implementing these changes feel that this approach results in inferior outcomes, and, in some cases, may not solve the problems the change initiative had been proposed to resolve in the first place. When questioned, participants suggest that in cases such as these, the rationale for the change may be more about being seen to be taking action, as the change initiator's goal is recognition, and not necessarily the resolution of a problem.

A Rationale for Self-Reflexivity

In general, participants indicate a strong alignment with their scope of innovation and change. Given that the desired outcomes are seen to be an improvement over the status quo, participants' descriptions of their work are focused on either outcomes or processes and do not contain significant challenges to the premise of change initiatives. Self-reflexivity comes about when participants are attempting to understand their own role in the change process. When the outcomes are being designed to benefit stakeholders, participants indicate a strong need to listen, since it is the stakeholders who have the necessary knowledge about their own needs. When outcomes are focused on business or enterprise outcomes related to projects, profits, or other initiatives, participants' reflection was focused more on the initiative itself and how the goals could be realized. It is perhaps the nature of the desired outcomes that influence the degree of self-reflection applied by change-agents, perhaps in proportion to the agent's degree of confidence in their state of knowledge.

The literature on uncertainty, especially where unforeseen consequences are being considered (Taleb, 2012 and Faulkner et al., 2017, for example), suggests that a recognition of uncertainty and risk mitigation should figure prominently in the scoping of an initiative. Despite the fact that even with the best efforts, uncertainty will always remain, agents of change should consider the limits of their own knowledge and seek to uncover as much as possible to make the best decisions they can. Participants' learning-related focus centred largely on stakeholders and how they might learn from those connected with their innovations or changes specifically. The rationale for learning from stakeholders is ostensibly to give voice to those who would be impacted by the change, but also carried a performative connotation of having solutions that met the needs of stakeholders. While stakeholder views are of critical importance and must be well understood to arrive at holistic solutions, there may also be a need to vet or somehow evaluate the knowledge shared by stakeholders, especially when there is disagreement among different stakeholder groups. Such comparisons may require recourse to scientific or other ways of knowing and potentially understanding that learning from other people must be supplemented by learning from scientific or statistical formulations of knowledge. The degree to which agents of change might learn from non-human sources (such as literature-based or scientific research) is unclear, as all participants' primary focus is on the human domain. This is likely due to the fact that the participants' work centres around innovation or change within largely human systems. It may be important, however, to situate the human elements within a broader context, to ascertain how those human structures and systems interact with other forces.

Within the question 'should we?' lies a hint of caution, of considering the larger context and evaluating if what is proposed presents risk that hadn't been considered previously. This requires an expansion of the scope of investigation and, according to participants, requires a systemic understanding

of the area of focus. The participants' desire to engage stakeholders and to continuously learn represents an expansion beyond their current level of knowledge and understanding and is closely in line with the concept of epistemic humility described in Section 3. Their inclination to seek out missing information and listen to unheard voices supports the claim that they recognize, either consciously or subconsciously, that their knowledge and beliefs can be improved by engaging with these possible new sources of information. The participants engaged for this study all seem to personify epistemic humility in the discharge of their work.

Epistemic Humility Enables Better Outcomes

Drawing from the literature reviewed in Section 4, the rationale for fostering epistemic humility as a virtue includes avoiding harms associated with epistemic injustice and encouraging learning that can be leveraged for better understanding among individuals and groups. While uncertainty cannot be eradicated, having more knowledge from diverse sources is considered to effect better outcomes for those pursuing change and innovation. These benefits were echoed by all participants in how they described their work. Even in very different industries, sectors, and at different scales of applicability, every participant described open-mindedness, curiosity, and learning as core characteristics of successful change agents. One participant described the learning that came from inadequate understanding of stakeholder needs that led to an implementation in a housing project that required rework to make it suitable for habitation. Being open-minded about what had been missed and seeking a better understanding enabled solutions that, in the end, met stakeholder needs. Although there was a soft acknowledgement of potential downsides to epistemic humility, all participants indicated a need for more epistemic humility among their peers, in government, in agencies and enterprises, in short, everywhere. While not all participants articulated an explicit justification for this opinion, it is clear that epistemic humility is seen as an essential characteristic for change makers.

In some interviews and in the workshop, participants note that change occurs at an individual level, and that there must typically be an impetus or motivation for an individual to cooperate with a change initiative. Participants describe how this impetus must overcome latent resistance or the fear of change within stakeholders. While the application of authoritative measures are one means of enforcing change, participants were adamant that successful change should instead be characterized by an inducement through collaborative means to gain the trust of stakeholders and to allay their fears associated with the change, without patronizing or explaining away valid concerns. Enacting a participatory strategy requires understanding the stakeholders well, and participants indicated that epistemic humility through acknowledging stakeholders as valued knowers is of prime importance.

Participants also point out that the goal when engaging stakeholders should not necessarily be to have everyone agree. Not only is complete agreement over a contentious issue unrealistic, participants felt that maintaining some tension is necessary to enable novel and innovative ideas to come forward. Where there is no conflict, or where individuals are too passive and humble to articulate where their opinions and knowledge differ from others', the opportunity for combining and learning may be lost. This idea is also expressed in the literature as described in Section 3 (Parviainen & Lahikoaien, 2019 and Kline & Rosenberg 1986), where tension, conflict, or disagreement is seen as a prerequisite for innovation. What is necessary in such tension and conflict, however, is an agreement of respectful conduct, even in the face of significant disagreement. Innovation also requires enough curiosity and openness to enable the collaboration necessary to bring ideas to implementation.

Addressing the Limitations of Epistemic Humility

Initial reactions by participants for whom the term 'epistemic humility' was new was generally positive. With further discussion and thought, however, all participants articulated some concerns with epistemic humility very similar to those expressed in the literature. Some participants seemed to conflate excessive non-epistemic humility and epistemic humility despite attempts to separate the concepts. Humility about the state of one's knowledge (epistemic humility) does not necessarily imply a self-effacing aspect in demeanor. Lynch (2019) describes how one can have significant epistemic humility while maintaining confidence and strong convictions. However, as noted in Section 4, opponents and even observers in debate may view the acknowledgement of the limits of one's knowledge as the capitulation of an argument. Participants in the study express that while epistemic humility is truly a desirable trait, the application and expression of epistemic humility must align with the context of a given interaction.

Achieving a balance between conviction and confidence on one hand while showing epistemic humility and being open-minded on the other may depend not on diminishing the value of one's own knowledge and beliefs, but by elevating those of others, particularly when there is disagreement. Epistemic humility involves acknowledging the limits to one's knowledge, seeking to improve one's knowledge, and seeing others as valuable knowers from whom one can learn. Applying that logic universally means that others can also learn from us. Perhaps the antidote to some of the concerns with epistemic humility involves maintaining a valuation of our own knowledge while we remain open to what we might learn from others. With the caveat that some do have greater knowledge in some areas and can provide perspectives of lived experience or expertise that others cannot, mutual regard for others' perspectives connects closely with the ideas of epistemic justice identified in Section 3 (see Fricker, 2007, Tanesini, 2016, and Goldberg, 2016, for example) and with the convictions of participants who shared their notions of stakeholder engagement. With the right approach and mindset, the participants seem to agree that epistemic humility is a desirable personality trait to cultivate.

In summary, participants were in general agreement with the ideas drawn from the literature review. Participants pursue change to make the world a better place. Their self-reflexivity may manifest more in understanding their own roles within initiatives and perhaps a greater degree of critical analysis of the desirability of the change itself could be incorporated into their work. Participants generally agreed that epistemic humility, embodied in holistic consultation with stakeholders and a felt need to listen well gives rise to better outcomes than when change agents are close-minded. Overall, participants agreed that epistemic humility was a desirable characteristic to be fostered in innovators, change agents, and people in general.

Discussion of this MRP Study

The concept behind this study is somewhat broad, and the narrowing required to make the investigation manageable required some compromises. While it is hoped that the work may provide the reader with some value, it is important to outline some limitations evident to the author and to suggest some possible directions for further investigation. The study was conducted over two semesters; one to plan the study and prepare a research proposal, and one to conduct the research and to write this report. If the academic timelines had been more extensive, more literature could have been incorporated, a larger number of participants, and potentially a broader pool of participants could have

been interviewed, and the workshop could have included more participants and possibly other sessions. The reach to contact participants was limited by the time available and by the author's limited network within this field of study.

The impact of limited time and a smaller pool of participants is believed to be modest, as it is hoped that the literature reviewed and the perspectives shared by participants provide a reasonable representation of the field. The test would be twofold: to continue to review scholarly work for significant deviations from what is outlined in Sections 2, 3, and 4, and to continue the discussion with other participants, preferably representing diverse industries, sectors, countries, and backgrounds. Another area of extension would be to consider the views of non-individual agents of change, such as how an understanding of epistemic humility and acting under uncertainty would apply to a group, organization, enterprise, or other collective of individuals. The nature or the research would likely need to change, but the learnings would perhaps identify other considerations of value.

There are no doubt many dimensions to consider if one (or many) should act, and epistemic humility is the angle chosen for this work. Other conceptions of assessing how individuals or groups ought to conduct themselves given imperfect knowledge could be considered and compared to epistemic humility. Undoubtedly the level of uncertainty, especially the unknown unknowns, creates an impenetrable barrier in some cases and no amount of epistemic humility would enable the outcomes desired. Perhaps there are other ways of understanding an agent's mindset in the pursuit of change. Epistemic virtues are embedded in and emanate from western philosophical thought. Participants suggested that non-western ways of knowing and doing could provide additional insight that would extend beyond epistemic virtue, ethics, and western morality. Learning from these other epistemologies would greatly expand the ability to understand the self-reflection required of one who seeks to ask 'should we'.

Finally, one other suggestion for further work is to consider how epistemic humility might be fostered. The author is biased with a predilection for the concept of epistemic humility, even if there are failures in its application, so the fundamental bias is that epistemic humility is positive. With that acknowledgement, some strategies encountered in the literature as well as offered by participants have been shared in this work. A confounding issue, as noted above, is that epistemic arrogance, when present, may thwart one's ability to foster epistemic humility. How do we foster epistemic humility in those who need it most; those who are epistemically arrogant?

8 Conclusion

This study began with a vague idea that ethical action in the face of uncertainty requires a measure of reflection regarding the rationale and motivation for those advancing a change as well as an assessment of the level of uncertainty about what is known and what the impacts of the change might be. The study considered both the ways individuals and groups can be open to receiving new information that can be deployed toward more desirable outcomes, as well as the nature of uncertainty itself. Interviews and a workshop were held with individuals who self-identify as innovators or change agents with a view to hearing their perspective on their work in a non-directed way. The ideas that emerged from the literature and from the study participants generally support the idea that well-conceived change requires active and enthusiastic learning. The best paths are found collaboratively and with open minds. The work is far from complete, however, as a project at this scale cannot possibly provide a full and complete answer to the research question.

To what extent does epistemic humility help changemakers assess if their change should be pursued?

Should a change be pursued? Simplistically, it may come down to a cost-benefit analysis. Do the ends justify the means? Is the prize worth the cost? Are those who must pay willing? What if the work goes sideways and unforeseen consequences arise? These questions can be ignored or the changemaker can attempt to answer them in earnest. If an innovator or change agent approaches their work with a sense of duty or responsibility (as those who participated in this project seem to manifest), having a systemic or holistic understanding of the area of focus and an open-minded approach may cast light on the dark corners and allow for approaches with the most benefits and fewest costs. Based on the literature reviewed and discussions with the study participants, epistemic humility seems to be a key prerequisite attribute for changemakers to foster in themselves and in those with whom they work.

Both the literature reviewed and statements from participants support epistemic humility. Participants emphasize the importance of listening and learning. As they pursue their innovation and change, they prefer strategies that enable multiple voices to guide their work. Within practical limits, participants want to engage with stakeholders and to reduce the impact of unforeseen consequences. Many of the ills stalking society (global warming, plastic pollution, poverty, mass extinction) are the undesired side-effects of actions that are or were deemed desirable by those pursuing them. If the desire expressed by study participants to remain open to conflicting and challenging information from multiple sources is representative of change agents in general, then perhaps the future is bright. If those pursuing change initiatives of all kinds are genuinely open to learning and if they can use diverse knowledge to build sufficiently robust models of the systems operating in their sphere of influence, then they may be able to steer around some of the undesirable futures. Participants agree that epistemic humility, which requires both an acknowledgement of the limits of knowledge and a concerted effort to address those limits, provides the right mindset toward approaching change and problem solving in a holistic way.

Epistemic humility allows for active learning. Recognizing the limits of one's knowledge and making sincere attempts to address gaps in our understanding has many benefits. Epistemic justice and avoiding epistemic wrongs are obviously desirable as outlined in the literature. Study participants are in

unanimous agreement that open-mindedness and a learner's mindset make them more effective innovators and change agents. As our knowledge expands, so too does the recognition of what we do not know. Change agents and innovators occupy a liminal and transitory space in the present, pushing toward their desired futures. Hindsight gives us evidence that the best laid plans give rise to outcomes that were neither foreseen nor completely desired. Though there will always be uncertainty, epistemic humility is both a reminder that we know less than we think we do and a call to explore, challenge, and expand our knowledge and beliefs. It is a call to view others, both those we agree with and those we do not, as valuable knowers from whom we can learn. Alternative perspectives we are offered by others may allow us to understand parts of the fabric of reality we didn't know existed before. This makes us better strategists and planners. The crux isn't about how we can avoid unforeseen consequences (since we cannot), but how we can address as many of them as possible through robust or even antifragile (Taleb, 2012) strategies. This requires careful self-reflection. This requires an acknowledgement of the ever-present ambiguity in innovators' and change-agents' work. It requires us to show humility in the valuation of our own knowledge. It requires us to pause as we ask, 'can we?' or 'might we?' and ask an equally important question; 'should we?'

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Appendix A

Selection of Interview Questions

Interview Questions

1. One of the identifying characteristics I was looking for in participants is that they identify in some capacity as agents of change. Would you mind giving me a summary of how you see yourself as an agent of change in the world?
2. What are some of the characteristics you think someone advocating for a change should have?
3. Are there ethical dimensions to your work as an agent of change?
4. How do you deal with uncertainty or knowledge gaps in your work as change agent?
5. Are you familiar with the terms 'Epistemic Humility and/or Epistemic Arrogance'?
6. Given [our discussion -or- the provided definition], how do you think Epistemic Humility as a concept relates to the practice of a change-agent?
7. Do you see Epistemic Humility as being the opposite of Epistemic Arrogance, or is their relationship more complex? Explain…
8. How do you see the relationship between epistemic humility and uncertainty?
9. Do you think Epistemic Humility as we've been discussing it is an important characteristic of someone engaged in making change?
10. From your perspective, do you see any limitations to the conception of Epistemic Humility that might make its pursuit problematic?
11. If you see epistemic humility as something to be fostered, how do you conceive that it could be encouraged in yourself and others?