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Three Paradoxes of Climate Truth for the Anthropocene Social Scientist

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ABSTRACT

Climate change has been one of the most contested truths for the last two decades. Many social scientists within the academy and this volume have spent years discerning the nature of this truth and articulating its importance for business, organizations and society. Yet these same scholars face a *triple paradox* in their work on this important issue. In this essay, we examine those paradoxes – (1) The Paradox of Eliminating the Main Driver, (2) The Paradox of Objectivity and Passion, and (3) The Paradox of Double Irrelevance – all amplified by how two institutional factors – the construction of climate truth and its translation in relational fields – affect them. We revisit not only how the three paradoxes affect the Anthropocene social scientist as an individual, but, in light of the tensions and two institutional factors, how s/he might rebalance these tensions by pushing back on the institutional actors while embracing paradox in personal choices.

Three Paradoxes of Climate Truth for the Anthropocene Social Scientist

TRUTH: the body of real things, events, and facts; ACTUALITY: the state of being

the case; FACT: (a) often capitalized: a transcendent fundamental or spiritual reality,

(b) a judgment, proposition, or idea that is true or accepted as true truths of

thermodynamics, (c) the body of true statements and propositions.

(Merriam-Webster Dictionary, online, April 2019)

One of the most contested truths on the planet for the last twenty years has been the

existence of human-induced climate change; defined as "a change of climate which is attributed

directly or indirectly to human activity that alters the composition of the global atmosphere and

which is in addition to natural climate variability observed over comparable time periods"

(UNFCCC, 2019). Many of us in academia and in this volume have spent years of study

discerning the nature of this truth and articulating its importance for business, organizations and

society. In the Organization & Natural Environment group (ONE), we see scholars examining

climate change through negotiation and agreements (Ansari et al., 2013; Schussler et al., 2014),

strategic responses by businesses (Delmas & Toffel, 2008; Hart, 1995; Lenox & King, 2001;

Russo & Fouts, 1997), and social movement politics (Reid & Toffel, 2009; Sine & Lee, 2009).

Our own recent work has sought to re-focalize some of this study at the level of the global

ecosystem in the Anthropocene Era; that is, the current, human-shaped geophysical epoch in

which we now live (Hoffman & Jennings, 2015; 2018a; 2018b; Jennings & Hoffman, 2017). We

have synthesized diverse lines of research to detail institutional inertia in responses to climate

change and various mechanisms that may create change (i.e., exogenous shocks, social

movements, entrepreneurial action, regulatory discretion). The grand challenge of these research

efforts and approaches has been to understand how society and specific sectors within it may address the challenge of climate change, including its spillover effects into other domains (Ferraro, Etzion & Gehman, 2015).

Yet scholars–particularly social scientists--face a *triple paradox* in their work on this important issue. A paradox refers to an ongoing tension due to fundamental opposites that are not resolved or resolvable in its existing context (Smith & Lewis, 2011). The paradoxes discussed here arise from the science of the Anthropocene; that is, from the various truths that it is revealing about our natural and social worlds. We label them: (1) The Paradox of Eliminating the Main Driver, (2) The Paradox of Objectivity and Passion, and (3) The Paradox of Double Irrelevance. In the first paradox, various forms of science (i.e. biology, climate science, oceanography, geophysics) have identified the role of humans as central drivers in ecosystem degradation. Yet scientists - and members of society – frequently disengage from logical solutions around this driver, such as population reduction and degrowth economics. This tension creates efforts to complexify remediation processes that build in longer time lines, increased populations, and accelerated consumption. All the while, the science of climate change indicates that much shorter-term responses, decreased populations and decelerated consumption are required. So, the principles of elegance and parsimony in presenting the most insightfully ordered findings for both the problem and solutions become markers of this paradox. To compound the problem, we live our lives in ways that continue to disengage from the problem; flying to conferences, eating more meat, driving rather than walking while we know that these behaviors are the actions that must change. On such issues, social scientists find themselves in a particularly unenviable position, for if society is to be preserved in the Anthropocene, experts on societal change will need to come up with the clever methods (i.e. policies, incentives, scenarios,

nudges) that can mediate among multiple scientific assessments of impending outcomes. Yet social science is not well-integrated with physical science to bring forward, stress test and translate those methods for relevant populations.

With regard to the second paradox, that of Objectivity and Passion, all too often, scholars allow scientific truths to speak from themselves, offering minimal advocacy or allowing others to advocate on their behalf. This practice is in tension with the fact that, while scientists are members of an academic community that espouses scientific objectivity in its inquiry, they are also citizens of the world and practicing members of various communities. As such, how can the scientific community dispassionately study a topic that may involve significant hardship and suffering for both human and other life forms (hence themselves)? More to the point – should it be so dispassionate and detached? Again, social scientists experience this tension to a great degree. For they are the translators of scientific truths of the Anthropocene into social and cultural realities (and vice versa). They need some form of objectivity as part of the scientific method, yet social scientists are also advocates for one sphere with the other as that objectivity holds great import for what we value in the world. On what firm emotional and intellectual ground can social scientists stand in the Anthropocene?

In the third paradox, that of Double Irrelevance, scientists are situated in organizations that can pursue basic science, which has helped them to uncover the methods for detecting increased greenhouse gas (GHG) levels, ocean acidification, and other critical measures of planetary boundaries (Rockström et al., 2009). But, as a consequence, these scientists often become more involved with scientific communities and less involved with policy makers and the general public. In fact, having little exposure to basic climate science, policy makers and the lay public tend to believe that most scientific work is debatable or even irrelevant. In the case of

social scientists attempting to translate this material into implications for Anthropocene Society, resistance is often encountered as social science conclusions bear on the personal values and behavior that people hold dear. This resistance is exacerbated by the lack of standing that social science often has within public discourse, convened scientific committees or policy gatherings, making them doubly irrelevant as the social and natural sciences are treated as separate domains, with the natural sciences enjoying elevated status.

Work on these tensions facing scientists and social scientists, if not the paradoxes per se, has been done. In his expositions on social science's methodology, Weber (1919), the father of institutional theory, subscribed to the notion that a fundamental divide exists between the natural and social sciences, which make some aspects of bridging the two (i.e. using *Versethen* with scientific truths) impossible and other aspects non-transferable (i.e., general laws of physics). Merton (1949, 1957/96), well-recognized for his philosophies of social science, delineated types of science, ranging from well-researched conclusions to reasonably-informed opinion and matched them with types of policy situations as a way of defining the domains where social scientists might offer expert advice and what kind. Critical theorists, building on Bourdieu (1984), have elaborated on the agentic role played by intellectuals and professional experts in modern society, along with their cosmopolitan perspectives (Wright & Nyberg, 2016). By virtue of their positions, these agents can advocate more persuasively for global issues like climate change (Alcarez et al., 2016), though they may only be foretelling the end of capitalism or Anthropocene Society and not averting that outcome. Latour (2014), as part of his re-engagement with natural science and agency, reminded social scientists to consider not only the role played by the language of the Anthropocene (i.e., to rely on semiotics and discourse to

capture meaning and for whom), but also to recognize the actual material change engendered by its markers, such as climate change (i.e., to shift a key ontological premise about materiality).

We build on these notions of the natural versus social science divide, on the complex role of the social scientist as researcher, expert, and advocate, as well as on the importance of truth and discourse in fields. We do so by revisiting the role of the social scientist as a translator of science (hence, as a form of partially aligned agent), and how s/he balances the tensions raised by the three paradoxes we outline to enrich her/his work and improve practice - yet without resolving the paradoxes (also see Jennings & Hoffman, 2017). But before elaborating on the role of the social scientist and what s/he might do in response to the paradoxes, it is important to consider two institutional factors that greatly shape the nature of these paradoxes. First, we need to examine how the social construction of climate change truths influences the paradoxes we observe. Second, we need to explore the translation of truths in relational fields. This translation process depends on the gathering and massaging of big data and social information within the new "Surveillance State" (Zuboff, 2019) and on the filtering of this digital material as it diffuses in relational fields through corridors used by both anti-climate and pro-climate groups (Hoffman, 2015). After examining these two factors, we return to how the three paradoxes impact the social scientist as an individual and examine how s/he might rebalance the tensions they create, in part by embracing paradox in professional and personal choices (Smith & Lewis, 2011).

The Social Construction of Scientific Truths Today

The current truth to which many in this special issue hold is that climate change is occurring and human have some fundamental role in that change. That truth about change is based on a set of convergent "facts": micro - but detectable - rises in temperature averages over

millennia, including more recently accelerated rises; variability in weather patterns within different global grids; large numbers of exceptionally warm or drier days;, and increased frequency and severity of extreme weather events, such as hurricanes, wildfires, floods and droughts. These data have been collected by a variety of physical scientists, with different, specific techniques. Nevertheless, examining all of these disparate facts, there is a consensus among 97% of scientists that climate change – specifically global warming - is occurring (Cook et al, 2016).

As part of detecting these critical values in various areas of the climate ecosystem, scientists have also noted that attendant levels of GHGs have increased dramatically in recent years, being manifest in accelerated levels of atmospheric carbon dioxide. Their concentration in higher latitudes is also associated with greater temperature rises and swings in weather patterns, leading to associated terrestrial ecosystem changes (i.e., Arctic and Antarctic ice melts, earlier springs, later winters, modified tundra conditions, etc.). This link between GHG levels and ecosystem change are inferred as coming come from humankind; that is, via GHG emissions from electricity and heat (31%), agriculture (11%), transportation (15%), forestry (6%) and manufacturing (12%) (World Resources Institute, 2017). Through "fingerprint analysis" scientists have determined that no equally obvious other driver on the planet can be causing these climate changes. If humankind is the driver, then it logically follows that something direct and concrete needs to be done about human production of GHGs before atmospheric concentrations reach the point of no easy (or evident) return (IPCC, 2018; Stockholm Resilience Center, 2016).

However, at the point of translation from the domain of science into the domain of public discourse, this set of facts about climate change and its drivers stops being truths that are supported by widely accepted protocols. Instead, they become "findings" by different groups

about different ecosystem elements -- i.e., their "perspectives". All are just "associated with" the possibility of (not "caused by") increased human activity. Scientists themselves often self-censor, unwilling to articulate "truth" or "facts" such as had been taught in basic science, but instead also subscribe to the language of "findings" and "perspectives." As an example, at a recent US National Academies meeting on the Science of Science Communication, scholars in attendance were reticent to call out efforts to confuse or misdirect social discourse on key scientific issues as deliberate disinformation or more bluntly, lies. Similarly, in the recent launch of one well-placed university's energy research area, falling just after the election in the surrounding oil and gas region of a new, more conservative government, little mention was made of climate change, occasional mention of GHGs, and human drivers were mentioned mostly as a point for positive change.

Translators of scientific findings from the various perspectives, whether in social science or in the media, further reinforce this subjective interpretation of climate change indices and human activity. Even in this special issue, we see evidence of this translation process among some social scientists, with climate change and the Anthropocene viewed as theoretical constructs derived from a diverse, if apparently related, set of findings. Indeed, as institutionalists, we ourselves frequently state that facts are merely "socially constructed," without reminding our audience (and ourselves) that there are varieties of social construction and degrees to which these constructions are adhered to in everyday life (Berger & Luckmann, 1966).

Similarly, the media has engaged in a vibrant re-labelling and categorization process as part of the recasting of climate change truths into climate change claims. These outlets serve their particular constituency with one end of the political spectrum (the left) held by climate

change believers and the other (the right), held by climate change deniers. There is also media to serve other groups divided along religious, age, ethnic, country of origin lines and other demographic groups, which are fed their own version of scientific "truth" by specific media versions and outlets. The powers of disinformation and denial can also come from those with political power to deflect acknowledgement of the problem or the science that supports it. At a May 2019 UN meeting on the Arctic, the US blocked any statement or treaty because proposed text included the term climate change, with US Secretary of State Mike Pompeo suggesting that an opening of the Northwest Passage for the first time in human history was a good thing for trade (Sengupta, 2019).

All of these actions tend to cede the middle ground of debate and collaboration to more extreme portrayals and portrayers of the "truth"- and for a form of truth that no longer matches what is discussed as "truth" in the domain of the physical sciences. In these multiple translation domains, scientific truth is contested by multiple groups armed with different facts or perspectives for interpreting facts, thus eliminating the possibility of debate or discourse grounded in accepted science. Through such processes, there is a fragmentation of the truth, leading to the dismissal of what is accepted by some and exaggerated by others. Over time, the weighting of these varied truths and their immediate meaning in the average person's world is just too unclear for scientific truth to do anything other than slowly evaporate.

Avoidance but imbalance. These moves to restate scientific truth as findings from various perspectives, to encourage scientific self-censorship, and to fragment scientific findings and perspectives while also attacking them makes some psychological sense to social scientists. The Paradox of Eliminating Humans as a Driver derives from the clash between a recognition that if Anthropocene Society (i.e., capitalism, consumption, growth, and associated economic

and social values) is the key driver of climate change and the Anthropocene, then that society must be modified fundamentally, dismantled or even, in the worst case, destroyed by its own folly. This paradox may appear so overwhelming to individuals and society that avoidance and denial become rational everyday strategies for handling it (Berger & Luckmann, 1966; Boltanksi & Thevenot, 2006). Yet, as we have seen, this move erases the potential balancing point for resolving this paradox (Smith & Lewis 2011) – in this case, where the truth about GHGs and the drivers are acknowledged, along with the need to preserve humanity by reducing them and adapting to their effects.

Interestingly, cultivating the notion of perspectives (i.e., subjectivity) while simultaneously debating whether a coherent, stable picture can be created by the findings from various perspectives as part of the Paradox of Objectivity and Passion also makes some psychological sense. If scientists, the media, and general public believe in the objectivity of science and the scientists who create it, then it would not only be difficult to avoid this paradox, but difficult to care deeply about displacing the current social system driving climate problems. Objectivity requires some degree of dispassionate observation and inference, rather than a value-based approach to collecting and interpreting data (Merton, 1956). However, a fundamental modification of society calls into question such approaches, as Oppenheimer noted when creating the atomic bomb (Bird & Sherwin, 2005). By claiming that facts are based on perspective, social observers and societal members alike are able to retain their values and pursue their own passionate versions of findings and truths (Kakutani, 2018).

Finally, the employment of scientific findings as a perspective on climate truth also makes some sense, for it allows for the third Paradox of Double Irrelevance to exist without having to address it. If there are only a variety of positions and sets of findings, and if social

scientists have less legitimate expertise for gathering and stating that knowledge than self-censoring climate scientists, then there is no reason to listen to the translation of these truths by social science experts (Hoffman & Jennings, 2018b; Latour, 2014). However, the meaning and translation of these truths in current society still requires us to consider a second prominent factor in the Anthropocene Epoch, the way in which relational fields now work in Anthropocene Society.

Translating Truths in Relational Fields

In the translation of truths about Anthropocene issues (such as climate change and biodiversity loss), we address both contestation and diffusion of truths. Translation, by definition, involves some restatement, remixing, and reshuffling of truth elements and propositions to allow them to be understood and accepted. Translation processes in current Anthropocene Society, however, include a different set of methods (notably social media) to reshape truth for at least two reasons: first, with many sources of data and analyses, the scale and scope of truth's reshaping, coupled with the means for controlling and guiding it, are qualitatively different than in the past; and, second, in many countries, relational fields appear to be affected by features of what has been called the "Surveillance State" (Zuboff, 2019), where the State is engaged in creating, monitoring and applying sanctions based on big-smart data and using AI-intelligences (or at least their outputs) that are still vaguely understood. Both these points might seem to be quite conspiratorial in nature; but they are not, because a third characteristic about translation in relational fields of the current Anthropocene Epoch is that agency exists yet is deflected, indirect, often misfired, and attributed post hoc (indeed, *claimed*

by actors, like President Trump) due to more limited control and access to accurate information that individuals enjoy today.

Let us return to the climate change example and consider translation of climate change truths in the more recent relational field around the 2015 Conference of the Parties (COP) 21 and the 2016 Paris Accord as compared to their translation in the relational field around the 1992 development of the United Nations Framework Convention on Climate Change (UNFCCC), leading up to the creation of the 1998 Kyoto Protocol. Relational fields "are relational spaces where multiple and often competing interests engage with other actors, often organized in communities, who may hold divergent ideas about the issues being contested" (Hoffman & Jennings, 2018b). They are often structured vertically and horizontally by governance arrangement, leading to some differentiation of power across social domains. The center of the 1992-1998 field that spanned the UNFCC and the Kyoto Treaty contained UN delegates and invitees from the 1992 Earth Summit meetings in Rio, key science delegates, the main representatives from the G-77, selected transnational NGOs and large businesses (Ansari, Wijen & Gray, 2013). The issue of climate change was central to this field, linked with the issue of the sustainability of the current way of life for future generations. The broad nexus of data from a number of scientific disciplines called into question our consumption, pollution and population levels, and pointed to problems in relying on a carbon-based economy. The 1992 Rio Accord (the UNFCCC) was signed by most nations, including the US, and several major corporations (i.e., BP and Shell) took it seriously enough to start re-imagining their futures. The 1998 Kyoto Protocol was a continuation of this relational field and was also signed by most nations. The refusal of the U.S. to sign, however, signaled an emergent fracturing of the center of the climate field.

Moving forward to the COP 21 and Paris Accord in 2015-2016, we saw massive numbers of state actors, NGOs, corporations, and transnational organizations like the UN. There were multiple tiers organized vertically and horizontally (see Schussler et al., 2014) that were engaged in the translation of the truth in the relational field. There were also competing fields in each country that transnationally pushed actively and vocally against the Accord, including political parties like representatives of the US Republican party and libertarian think tanks. Furthermore, the amount of data that were produced and debated about climate truths and the positions and backing of the translators of those truths were so large that they lead to the use of all of the simplification heuristics warned about by Nisbett & Ross (1980), ranging from false modeling to salience effects. With this new field configuration, the small and focused cadre around leaders promoting truths with their masses (i.e., populism) became more extreme regardless of the extent to which they did (or did not) understand those truths – except to know that reshaping and claiming them as fast as possible would appease their followers. In the meantime, the big smart data systems for disseminating climate change science kept yielding more complexity that only AI systems or specialists could understand, meaning any normal human might can only look at the patterns (i.e., of the weather) to make their own prognostications.

The relational field in which climate truths in the Anthropocene are cast by scientists and translated, then, has a large complex layer of corpora and networked informational "agents" creating and drawing upon these corpora, which, underpin whatever is taken as "climate change truth". Only by examining the way in which the relational field and the big data corpora around climate information is organized and accessed can the translation process, and the subsequent application of the information, be improved. Let us take an example around the truth of temperature change. In the 1999-2008 period, the Intergovernmental Panel on Climate Change

(IPCC) and other scientific agencies synthesized findings and discussed GHG links to temperature rises (Ansari, Wifen & Gray, 2013). The accelerating micro-temperatures (changes in Celsius around the .01 to 1.0 level) were not doubted; but their meaning was debated among those supporting and opposing the science (Hoffman, 2015). The visuals were dubbed the "hockey stick" graph, which was both illustratively accepted and controversially attacked (Goldenberg, 2010). The use of metaphor here was neither for comparative nor imaginative reasoning, but part of rhetorical restatement.

Today, more than a decade later, in most research and public forums the acceleration of micro-temperatures is no longer debated – only the amount of acceleration by the end of this century. Instead, the meaning of the micro-temperature changes for local experience has been the focus of debate between naysayers and believers. "The temperature in Michigan or Alberta sure wasn't any warmer in March or April of last year than the year before" versus "The number of record-breaking hot days has gone up for the last two decades." Again, these varying positions are based on data and personal opinion, assembled on a vast scale and consumed by many in a way that allows them to participate in this debate. These perspectives are used to define what is the "new normal."

Going forward, we believe that the information bedrock in the relational field will continue for some time to be about volatility in different weather systems – unbearably hot days and bitterly cold days, flood and drought periods, hurricanes, iceberg calvings, wildfires, and so on. Big data will be used to capture these events on grids, to scrape together risk for actuarial tables, and to aid firms in assessing real options risks. Many web sites, from regional to national, will be used to display these findings and will be frequently accessed by a wide variety of field members to frame the new normal. Consequently in this Brave New World of the Anthropocene,

the sources of big data, of modeling, of crafted and cobbled-together climate truths shall depend on a relatively few portals and progenitors of information, such as the IPCC, the International Energy Administration, World Bank, and United Nations transnationally; and more regionally relevant sources in national contexts, such as the US Geological Service and Environmental Protection Agency in the United States.

But it is government agencies involved in climate change data collection and modeling coupled with the data dissemination organizations in each country (i.e., Google, Amazon, the Weather Network) that will have an increasing capacity to shape information about climate change. We are becoming increasingly aware that standing groups who control such sources of information have tremendous power in the climate change debate (and all social debate). In addition, and more disturbingly, with the help of data-based corporations like Google and Facebook, they are able to track social media use by various parties and filter information to suit individual needs or objectives. Indeed, the climate models and information, once uploaded, have digital fingerprints for the knowledgeable corporation or government agency to read. They also have digital packaging that is more flexible and translatable than might appear evident to those used to just verbal or written communication for expressing thought and facts. As Zuboff (2019) explains, the State seeks to seal off the normal operating reality of individuals from its production, thereby ensuring control. In the many countries, this occurs with and through the help of large firms. In others, "…the state will run the show and own it, not as a market project but as a political one, a machine solution that shapes a new society of automated behavior for guaranteed political and social outcomes: certainty without terror. All the pipes from all the supply chains will carry behavioral surplus to this new, complex means of behavioral modification" (Zuboff, 2014: 394)

How the Relational Field Further Diminishes the Role of the Social Sciences. In the current Anthropocene relational fields in which climate truths are translated and diffused, we can see that both physical and social scientists have pulled back from the notion of truth and self-censored by promoting their findings and perspectives rather than facts and truth. More specifically, social scientists, as experts about society, are seen more as its advocates than as knowledgeable and trustworthy sources for translating findings for the general public.

This censoring and translation process in the modern era, then, related to restating truth as findings in perspectives deepens the Paradox of Objectivity and Passion. Yet the social science passion and perspective, unlike that of physical scientists or religious leaders, are mostly considered irrelevant. As mentioned, climate scientists often perceive us social scientists that way- as not knowing much about scientific truth and its translation into findings. At the same time, the general public and policy makers consider social scientists to be blinded by their perspective regarding society. As a result, social science perspectives are seen to have no more credibility than the public's own perspectives.

Furthermore, because large corporations gather and interpret their own social and scientific data, pulling them together into models, and then vetting their results to varying degrees with government agencies, the social scientist is trapped in an ever more marginalized position in current relational fields, unable to find unique or deep links between truth and scientific facts and current policy needs. S/he is just swimming in a similar sea of facts and models as everyone else assessing Anthropocene events. The social scientist, then, faces the Double Paradox of Irrelevance – indeed, a "double-double" – for s/he is irrelevant to the climate scientist on one side, and to the general public and representative policy makers on the other,

plus s/he is less relevant for collecting core social system data and lacks the technical resources of the large corporations for synthesizing and interpreting it.

Embracing the Three Paradoxes as an Anthropocene Social Scientist

What should the Anthropocene social scientist do in the face of this triple paradox that has become more extreme due to the nature of fact and the relational field in the current era? The scholar as citizen has two choices: First, s/he can disengage, filter information, and remain disconnected from real world issues. Such a scholar tends to live in the "ivory tower" or their own personal research "bubble" and translate science-based information only to the academic machinery for doing so. As such, s/he protects themselves from the chaos of real world debates. Second, the scholar as citizen can engage and risk emotional burdens, demoralization, pessimism, or even break-down. The scholar who is more connected to news, knowledge and information are more likely to feel this tension. Looking at our own shelves of books on the Anthropocene yields demoralizing titles like *Learning to Die in the Anthropocene*, *The Uninhabitable Earth* and *We're Doomed, Now What*? Adding to the emotional burden, each new day seems to bring further news of powerful government agents continuing their assault on climate science. Even at the time of the writing of this article, US government representatives have begun a concerted effort both to reinforce the idea of climate change as exaggerated at best and a "hoax" at worst, and limit the production of scientific data and analysis that might present it as otherwise (Davenport & Landler, 2019).

Neither of these choices seems to have promising personal and professional outcomes. Is there a "third way"? We suggest that the social scientist can push back in the case of each paradox, trying to find a better balance point. S/he might do so by working with the dynamics in

the Anthropocene dimensions – i.e., the nature of truth or on relational fields – and the way they manifest themselves in particular paradoxes.

To overcome the Paradox of Eliminating Humans as Drivers, we suggest an avenue for respecting the truth from science-based construction and the reconstructed truths from the translation processes just described by thinking about more empowering flexible uses of truth. One such version that we have applied is "scenarios" of the Anthropocene (Hoffman & Jennings, 2018a, 2018b) that offer both some elements of scientific findings and postulates as well as the imagined futures extrapolated from particular readings of those findings. The readings are, at least in the case of our theorizing, based on the agreed upon standards and recognized set of institutional theory elements (from fields through institutional entrepreneurship activities). Such readings reveal more contested or extreme scenarios around dystopian scenarios on one end of the spectrum and utopian scenarios on the other - what we have termed the Collapsed Systems versus Cultural Re-Enlightenment scenarios respectively (Hoffman & Jennings, 2018a; 2018b). Scenarios also allowed us to consider middle range possibilities based on more taken-for-granted beliefs such as the market (Market Rules scenario) and technology (the Technological Fix scenario).

The degree to which individuals, organizations and fields of organizations subscribe to these scenarios shapes the future paths for the pursuit and translation of truth. The continued chaotic debate over the climate reality would continue in the dystopian scenario with accelerating micro-temperature changes heading past six degrees Celsius. Yet climate facts around the increase in GHGs could be accepted and lead to careful management and technological reduction methods in the utopian scenario. Holding these scientific and social truth variants in mind, and looking where we have been versus where we might imagine we could go

is the crux of the current tension faced by the social scientist working with the Anthropocene as a new reality.

As a member of the society that envisions these scenarios, the social scientist may also choose to model behaviors that reflect their desired outcome – flying less, eating less meat, walking more and driving less. By enacting a desired future reality and modeling it for others (notably students), it may become more socially affirming to believe that such a desired reality can come to pass.

To rebalance on the Paradox of Objectivity and Passion, we might consider the aims of our work and its progression. Scientific inquiry commonly moves from viewing data, to organizing information, to constructing knowledge, to producing wisdom (Ackoff, 1999). However, many have argued that science is best at the first three and weak at the fourth (Maxwell, 2007). From data to information, we recognize relations and from information to knowledge, we recognize patterns. But from knowledge to wisdom, we recognize principles. But the application of principles in social science and management research poses a quandary for the norms of "objective" research. The application of broader social principles to our work – fairness, justice, equity, sustainability – go beyond standard values of profit maximization, efficiency and theoretical relevance. These broader social principles are often present in our work and ourselves, but the drive towards "objectivity" forces us to prepress them.

Why can't we have an opinion on what we consider a "good" outcome based on principles? Researchers in engineering and the physical sciences suffer far less of this burden. They study materials and have very definite ideas of the outcomes that they consider good and want to see based on principles of quality, performance and properties. Why can't researchers in the social sciences do the same? To aid in a resolution to this question, there is a growth of

critical voices (i.e, Benjamin, 2018; McDonald, 2018) examining business school pedagogy and its moral ambiguity. Business schools, unfortunately, are often the vehicles for self-interest and maintenance of the status quo rather than catalysts for a better future. But many are beginning to reassess the values we promote (or don't promote).

To wrestle with the Paradox of Double Irrelevance, the social scientist might actively choose to assert his/her relevance. There is growing research and practice about expanding the role of the academic from one that merely creates knowledge to one that also translates and transmits that knowledge to relevant communities that can apply it. This expansion of role and skillset on the part of the individual social scientist to that of the "engaged scholar" (Hoffman, 2016) requires learning new sets of skills in science communication and public engagement, as well as the adoption of new rules and procedures around evaluating multiple modes of impact, and adopting new forms of tenure and review. Indeed, there are signs that these changes are underway as more scientists see their obligation to bring their knowledge and expertise to bear on society's great challenges (Lubchenco, 1998; 2017).

Conclusion

When facing the three paradoxes, Anthropocene social scientists will likely have to make such hard choices, engaging in activities without prior precedent and preparation. The extent to which we are living in unprecedented times and studying unprecedented problems requires careful innovation and improvisation to foster new solutions to new problems. The issue of climate change and the broader phenomena of the Anthropocene represent a new and unknown period in human history, one for which we are ill-prepared. How can we study an issue that has the potential to create an apocalyptic future for all life on the planet with the same practiced

objectivity that has been the model for studying less pressing issues of managerial administration and corporate practice? The scale and import of this new issue are beyond anything we, as social scientists, have ever before studied.

The context in which we now operate is equally unprecedented. The extent to which fact and opinion have become blurred in an era of "alternative facts" and organized misinformation is unprecedented (Kavanaugh & Rich, 2018). And the corresponding extent to which previously trusted sources of information (notably academic scholars) are questioned or even dismissed in large segments of society bodes poorly for the ability of scientists of all kinds to bring their knowledge to inform pubic and political discourse.

But, to ignore the hard choices represented by these two elements of our work and reality would be a grave error. Academic scholars have an obligation to bring their work to those in society who can benefit from it, and the challenge of correcting the poor quality of public and political discourse on the great issues of our day rests with us. There is no choice. We must adapt and respond. The encouraging news is that some are stepping out and engaging in the hard choices just described. Joseph Stiglitz, for example, has spoken out loudly on the issue of income inequality and its corrosive impact on society (White, 2017). Many climate scientists, such as Michael Mann and Katherine Hayhoe, have also become visible spokespeople, informing the public on the scientific basis for the science of climate change. New outlets, such as The Conversation, Behavioral Scientist and the Monkey Cage allow scientists to reach public audiences with greater ease than ever before. And new metrics, like Altmetric and Impact Story, are attempting quantitatively measure the impact of such activities so as to shift the rules and norms of academic rewards and incentives. And finally, it appears that a younger generation of scholars is entering the field with a more vivid recognition of our challenges and a desire to

change things. They are questioning taken-for-granted assumptions on the narrow range of accepted roles for the academic scholar, and developing new skills in an era of social media and active disinformation to expand that range of accepted roles. What we need is more senior scholars to model new behaviors and work to change the institutions of the academy into which those young scholars will emerge. The future of society in the Anthropocene is indeed uncertain, and the role of the academic scholar in that future society is also uncertain. Only by embracing the paradoxes we now face will we create a future that offers hope for society to address its challenges with sound research and knowledge.

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