Scenario Planning for Sustainability:

Understanding and Enhancing Participation in Group Deliberations

by

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ABSTRACT

Scenario planning originally garnered attention within the corporate sector as a tool to manage energy transitions, but it has gained traction within the field of sustainability. It is a process for exploring potential futures and thinking critically about complex decisions that involve high degrees of uncertainty. It is also effective in shifting mental models, engaging diverse stakeholders, and enhancing organizational learning, making it ideal for the complex problems that sustainability seeks to address. The resulting insights from scenario planning are typically used in strategic planning, which further aligns it with sustainability's commitments to action-oriented solutions.

As a highly participative process, its success hinges on inclusive and just engagement of participants. This dissertation employed a multimethod approach to address the question, "What impacts do social dynamics have on participation in scenario planning for sustainability?" First, I conducted an ethical exploration of participation, looking to the systemic societal factors that might function as barriers to authentic participation. Next, I conducted an ethnographic study of a scenario planning workshop to identify ways in which social influence and authority impact participation in the process. Finally, I piloted a psychology study that explored the impact of explicit acknowledgement of status differential and the use of pre-event brainstorming on participation in a small group task that parallels scenario planning interactions.

In doing so, this dissertation presents a conceptual framework from which to understand the role of participation in scenario planning for sustainability and coins the term "strawman participation," drawing attention to the role and function of social influence in participatory processes. If "token participation" arises from participants not being granted decision-making power, strawman participation develops from social/structural barriers, then "authentic participation" allows for both decision-making power and social capacity for participation. Though my findings suggest that scenario planning utilizes methods to equalize participation and engage diverse participants, factors such as status differentials and gender dynamics impact authentic participation. Results of the pilot study point to the utility of status concealment and individual-level brainstorming to bolster participation. Ultimately, this work contributes to a more nuanced understanding of participation in service of more robust, pluralistic sustainability decision making.

DEDICATION

To my family (blood related or otherwise, two-legged and four).

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CHAPTER 1

INTRODUCTION: UNDERSTANDING SUSTAINABILITY AND THE ROLE OF SCENARIO PLANNING

Introduction and Problem Statement

Sustainability is a phrase that has gained significant momentum within both the scientific community and the broader societal community. The term is at times used in very broad ways (keeping the world going on forever) and also in overly narrow ways (green washing or recycling); this can add to confusion in communication and in identifying strategies and actions. However, an ever-growing human population combined with a dependence on technology based modifications to our environment and degradation of natural resources has put the human species in a potentially precarious position so the field, based on a normative desire to sustain human and environmental well-being, must continue to build knowledge and address problems despite lack of shared clarity. There is a societal need for movement toward adaptation toward a more stable and sustainable future, but with so many variables at play it is hard to identify exactly which threats are most pressing for society to adapt to. As Stewart contends, "uncertainty in prediction simply means that, given current knowledge, there are multiple possible future states of nature." (Stewart, 2000, p. 41). With the high degree of uncertainty and risk currently facing efforts to build a sustainable society it's necessary to build adaptive capacity, strengthen a system's ability to "cope with, manage or adjust to some changing condition, stress, hazard, risk or opportunity" (Smit & Wandel, 2006, p. 283), even without an exact knowledge of what society is adapting to. Sustainability should do this in a just and equitable way so that all people, including the most

vulnerable and least heard, share the benefit of such adaptations. Ultimately, all of society must prepare for multiple potential futures and sustainability must therefore confront 'the future' in sophisticated ways.

With this in mind, scenario planning becomes an incredibly powerful tool for sustainability because it is designed to address uncertainty by engaging stakeholders in deliberation of multiple possible futures (Peterson, Cumming, & Carpenter, 2003). Though it is a tool with great capabilities, like any other method, it has its shortcomings. In the case of scenario planning, its greatest strength also has the potential to be its greatest weakness. Specifically, it uses collective knowledge to build a stronger understanding of the future. However, individuals, and the collective, are influenced by often invisible or unrecognized sources of manipulation or social influence. Without proper identification and acknowledgment of the role of social influence in future oriented deliberative processes, the value of incorporating diverse forms of knowledge might be undermined. As such it is important that sustainability scientists and scholars continue to interrogate and refine scenario planning. Towards this effort, this dissertation, first, explores what authentic or genuine participation may look like and the role societal context plays in permitting or hindering it, then it describes the nature of influence that arises organically during a scenario planning process, and finally tests a potential cause for undue influence as well as a potential step that might help bolster participants when faced with this influence.

This chapter seeks to first establish an understanding of sustainability through exploring definitions from the literature and also through questioning the boundaries around what constitutes the purview of sustainability as delineated by various

frameworks. Secondly, sustainability is seated within a relatively new category of science known as "post-normal science" (Ravetz, 2006) and the unique attributes and requirements needed for engaging in this type of scientific inquiry are discussed. Finally, scenario planning, identified as valuable in this context of post-normal science and the sustainability literature, will be explored as a tool for gaining diverse knowledge inputs which can lead to creating direction for future sustainability.

Exploring the Challenge of Defining Sustainability

Sustainability is a challenging and, at times, mercurial concept. Some within the sustainability community have taken a pluralist approach, accepting a variety of normative interpretations regarding what sustainability encompasses. For example, informed by disciplinary foci or the cultural lens of the researcher, some interpretations may prioritize environment health while others prioritize economic well-being. The acceptance of multiple definitions of sustainability, in turn, allows for a more expansive utility than taking an overly reductionist stance (Gasparatos, El-Haram, & Horner, 2009). While this inclusiveness has encouraged uptake of sustainability by a wide array of disciplines and organizations, that same inclusiveness has made defining sustainability a challenge. The academic community has agreed upon its elements -environment, society and economy – often represented by three overlapping or nested circles (Adams, 2006; Littig & Griebler, 2005), but simply including all three elements does not create any more clarity. The variables of environment, society and economy can be used to encompass everything in the world; more clarity and focus is needed. The challenge with creating a definition often lies in individual perceptions on which, of the three constructs, is most important to emphasize and may be argued that establishing a specific definition of

sustainability may only constrain its utility (T. R. Miller, 2011). There is value, however, in delving into how various sustainability scientists have grappled with and operationalized this pluralistic construct. Pearce, Markandya, and Barbier offer this economically driven definition of sustainability: "Maximizing the net benefits of economic development, subject to maintaining the services and quality of natural resources over time" (1989, p. 42). Fresco and Kroonenberg present a definition of sustainability that focuses explicitly on the environment: "the dynamic equilibrium between natural inputs and outputs, modified by external events such as climate change and natural disasters" (1992, p. 155). Lynam and Herdt define sustainability as "the capacity of a system to maintain output at a level approximately equal to or greater than its historical average, with the approximation determined by the historical level of variability." (1989, p. 384) Lynam and Herdt's definition is, perhaps the most universally useful, but that may be attributed to its formulaically vague nature.

One of the most widely adopted definitions of sustainability was gleaned from the Brundtland Commission's work. Though the preceding conference, the 1972 United Nations Conference on the Human Environment, was more broadly focused, the Brundtland Commission focused its sights on sustainable development. It is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p. 43). Sustainability, though sharing many of the same values and often used interchangeably with sustainable development, can be differentiated most easily by its focus. The focus of sustainable development is decidedly anthropocentric and economic, concentrated on development,

or growth, particularly for poor nations and engages with a variety of disciplines in service of this economic focus (Beckerman, 1994).

Many sustainability scholars have chosen to adopt this anthropocentric development-focused definition as their working definition of "sustainability," particularly social science based researchers (e.g. Boud, 2000; Peters, 2010; Rosenberg, Fogarty, & Shepherd, 1993). However, this is not a focus that the field has come to a consensus on and as Lynam and Herdt (1989) point out, such a definition is less useful for those operating outside of the development sphere. Moreover, Robinson critiques sustainable development because it suggests, "ameliorating, but not challenging continued economic growth" whereas sustainability "focuses attention where it should be placed, on the ability of humans to continue to live within environmental constraints" (2004, p. 370). Sustainable development is best able to represent "weak" sustainability, which is explicitly oriented toward human well-being and economic constructs (Vucetich & Nelson, 2010).

Much of the research and academic discourse around sustainability has taken place within the emerging field of inquiry "sustainability science". The focus of this body of work has not been on defining sustainability and has, instead, been concerned with delineating *how* sustainable actions are taken. Clark describes sustainability as "a field defined by the problems it addresses rather than by the disciplines it employs" (2007, p. 1737). He adds that the focus of sustainability science is more integrated and "transcends the concerns of its foundational disciplines and focuses instead on understanding the complex dynamics that arise from interactions between human and environmental systems" (Clark, 2007, p. 1737). Furthermore, it includes the "ability of a natural, human

or mixed system to withstand or adapt to endogenous or exogenous change indefinitely" (Dovers & Handmer, 1992, p. 2). Sustainable development sits within this definition but does not, alone, meet the definition of sustainability. As such, any shared definition of sustainability should meet the ideals of "weak," but should also meet the ideals of "strong" sustainability, which tends to be comparatively ecocentric and prioritize environmental integrity and conservation (Vucetich & Nelson, 2010).

Bounding Sustainability as a Means for Enhancing Understanding

Given the broadness of scope of sustainability, many scientists have shifted their focus from attempting to create a universally useful definition to the task of delineating frameworks (beyond simply society, economy and environment) that better capture sustainability. Below, I outline three different frameworks useful for bounding the field of sustainability that will help focus my research. Additionally, these frameworks suggest three critical types of work that must occur concurrently within the field.

Gallopin (1994), who is commonly cited, takes a systems approach to delineating the bounds of sustainable development, which has been also applied to sustainability. He identifies four shared characteristics of sustainable systems: Adaptability and Flexibility, to be yielding and open to influence by outside factors; Robustness, Resilience, and Stability, to be able to withstand negative events without catastrophic consequences; Capacity of Response, to see change occur and to be capable of changing as well; Self Reliance, to be able to maintain autonomy while not being entirely inflexible regarding cooperation; and Empowerment, to be able to incite action through internal mechanisms.

This framework focuses largely on human activities and behaviors in response to the natural environment.

Gibson's (2006) model is commonly referenced (Bond et al., 2011; Morrison-Saunders & Therivel, 2006; Sheate, do Partidario, Byron, Bina, & Dagg, 2008) due to its indicator-based, sustainability-assessment focus which has found traction as a tool for evaluating the sustainability of systems and/or interventions in a way that gives credence to environmental, societal and economic structures. He identifies eight principles for evaluating the sustainability of a given system. Though he does not focus specifically on development, his principles, much like Gallopin's, are society-focused. His eight principles include: socio-ecological system integrity, livelihood sufficiency and opportunity, intragenerational equity, intergenerational equity, resource maintenance and efficiency, socio-ecological civility and democratic governance, precaution and adaptation, and immediate and long term integration. It is interesting to note that, though three of his principles do speak to environmental concerns (socio-ecological system integrity, resource maintenance and efficiency, and socio-ecological civility and democratic governance), they do so directly through the lens of the human experience. Notably, this model is primarily focused on monitoring institution-level management of natural systems for human well-being.

Vucetich and Nelson (2010), though perhaps less commonly applied than the other two, provides a useful balance to Gibson and Gallopin and are particularly relevant to developing a definition of sustainability for my research. The framework identifies five elements to sustainability. They are: "development of efficient technologies and markets for meeting human needs," "understanding the state and nature of ecosystems,"

"understanding how exploitation effects ecosystems," "understanding how exploitation affects human cultures," and finally "understanding the meaning of normative concepts such as human needs, socially just, depriving, and ecosystem health" (Vucetich & Nelson, 2010). This framework is particularly useful in its simplicity and in its ability to capture the elements of technology, environment, societal health, as well as reflecting societal assumptions around how we understand and interact with the world. Through its broadness it succeeds at encompassing the pluralistic perspectives within sustainability and allows for the co-existence of both weak and strong sustainability. As such, this framework will serve as the working definition for sustainability for this dissertation. It is important to note that, though this dissertation does, similarly to Gibson and Gallopin, focus on social elements it does so in service of a holistic stance. With human activities so impactful to the environment, society cannot make significant environmental gains without addressing issues related to people.

Through reviewing the three frameworks, it is clear that they share elements of overlap. For example, both Gallopin and Gibson address adaptation, their approaches are quite different with Gallopin establishing the need for a systemic approach while identifying key components of such a system and Gibson building off of this via identifying sustainability-specific indicators. Vucetich and Nelson's framework takes such broad strokes as to easily encompass the other two frameworks. However, each framework makes a unique contribution to understanding elements of sustainability. Gallopin's framework identifies an action-oriented subset of sustainability: identifying types of activities that need to be undertaken and characteristics that humans within the environment should embody for sustainability. Gibson's framework compliments the

guidelines laid out by Gallopin in that it identifies the critical element of assessment or evaluation as a means of ensuring that efforts are accomplishing the desired results. Finally, Vucetich and Nelson's framework focuses on broad knowledge areas and clarity around conceptual understanding. As such, the three frameworks not only contribute to establishing boundaries and critical elements within the field of sustainability but also come together to bring clarity around the need for enhancing understanding and knowledge, taking informed action, and finally evaluating that action for effectiveness.

These elements of knowledge-building, action-taking, and evaluation are critical to a holistic understanding of sustainability and, therefore, of prime importance to the methodology of this dissertation. However, there is a secondary element, an imperative that exists within each of the frameworks, though it may be latent at times; it is the need to take action today while anticipating long-term societal and environmental needs. Thus, the aim of this work is to contribute to the development of sustainability-related knowledge sets and, more specifically, enhance understanding of how knowledge sets are joined, contextualized, and framed through the participative processes that decision makers and society members employ in service of a more sustainable future.

Post-Normal Science for Sustainability's Wicked Problems

Though each of the frameworks presented varied in terms of their focus or scope, what they share in common is an emphasis on taking a *systemic* approach to sustainability. There are many reasons to do this, not the least of which is the interconnectedness caused by such a global, resource, and technology dependent culture. A systemic approach to sustainability is critical because of the elements at play within the problems that sustainability science often seeks to address (Gallopín, 2003). The problems are generally (1) complex, involving a variety of inputs, (2) impacting various stakeholders, and (3) are bound to other systems and problems, such as the complex relationship between environment and society (Kinzig, 2001). For example, the main scenario planning case study investigated in this dissertation focuses on energy, a field which requires a systematic lens given the complexity and scope of its reach; it touches economic, technological, and perhaps most importantly societal systems, which contain the values and norms that underpin decision making around energy.

The complexity and interconnectedness of sustainability problems compound the degree of uncertainty embedded in both the processes and the outcomes. Each of the many variables at play within a system has a variety of potential outcomes and the range potential outcomes may shift in response to changes in other variables. For example, the Intergovernmental Panel on Climate Change (IPCC) is a group of thousands of scientists from nearly 200 countries that collaborate to enhance societal understanding of one sustainability issue tied to energy-climate change. Well aware of the element of uncertainty, they attempt to address it in their scenario-based projections by including a range of potential outcomes. Despite the IPCC's group of knowledgeable scientists, their 2000 Special Report on Emission Scenarios drastically under-predicted the increase in carbon emissions because they failed to account for economic growth in Asia and Africa (Pielke, Wigley, & Green, 2008). In fact, the amount of carbon dioxide emissions they predicted for all of Asia was significantly less than what was actually experienced by China alone. Even with knowledge of future uncertainty, accounting for it is still a challenge to successfully identifying and addressing sustainability issues.

Due to the challenges associated with sustainability problems, sustainability is often characterized as a "wicked problem" (Norton, 2005; Norton & Noonan, 2007). "Wicked problems" are problems that are not easily solved because there is incomplete or imperfect knowledge and no "optimal" or "right" solution (Rittel & Webber, 1973). Though Rittel and Webber originally created the concept of wicked problems around planning and policy, Conklin (2005) adapted the concept to have a broader scope. He identified six characteristics of wicked problems: (1) an inability to understand the problem fully until after a solution has been formed, the iterative process of exploring solutions allows you to identify new elements of the problem; (2) there is no clear "end" to the problem, it is never solved or gone; (3) there are no correct or incorrect solutions, though some may have more desirable outcomes than others; (4) though there may be ways to categorize wicked problems, each one is unique; (5) solutions are "one shot operations," meaning that every intervention has consequences to the system; and (6) there are no "given alternative solutions," this can mean that there are several available solutions or even no solutions at all (Conklin, 2005). Wicked problems are, indeed, complex, but there are some issues that are more challenging. In fact, certain sustainability problems, such as climate change, have been lumped under and extended subcategory of wicked problems called "super wicked problems" (Lazarus, 2008; Levin, Cashore, Bernstein, & Auld, 2007).

To further explicate super wicked problems, Levin et al. (2007) expanded on the work of Rittel and Webber by identifying four additional characteristics that are not present in wicked problems. The first is time sensitivity or, in other words, that there are serious consequences if actions are not taken sooner rather than later. The second characteristic is a lack of a "key" decision maker. This may take the shape of an actual lack of authority, a lack of collaboration between authorities, and/or a lack of power on the part of the authority. The third characteristic is that supporters of change are also the barriers to change. Using the example of climate change, those who seek to lower carbon emissions are also the same people using energy and creating carbon emissions. The fourth and final characteristic is hyperbolic discounting. "Hyperbolic discounting" is a term used to describe a type of time discounting. Often times, people appreciate that they must consider the long-term future but instead make decisions that favor short-term wins.

When compared to wicked and super wicked problems, the issues that traditional or "normal" science seeks to address are comparatively reductionist and myopic in scope. Normal science seeks, not to make large leaps in understanding, but to build the whole through gathering of details and findings (Kuhn, 1970). This myopic gaze is necessary in normal science because it allows for predictability and certainty. Unfortunately, wicked and super wicked problems are novel and systemic in nature, thus, traditional science tools are, alone, ill equipped for confronting them. Sarewitz clarifies that the problem associated with normal science "can be understood not as a lack of understanding but as a lack of coherence among competing scientific understandings" (2004, p. 386). Funtowicz and Ravetz (1993) developed the construct of "post-normal science" as a means of addressing such complicated, or wicked, problems. The hallmarks of post-normal science lay in its focus on uncertainty, pluralism in perspectives, and allowance for explicit demarcation of values. Post-normal science is most appropriate when the stakes for decision making are high and/or when uncertainties surrounding an issue is particularly

high (Funtowicz & Ravetz, 1993, 2003) as is often the case with sustainability-based problems (Ravetz, 2006).

Related to the work of Funtowitz and Ravetz, Gibbons delineates between the type of knowledge created by normal science and the knowledge created by post-normal science with a specific focus on how it is generated and communicated. Mode one knowledge, created by normal science, can be characterized as sitting within typical academic communication and expectations, through which it communicates in a linear fashion via traditional (e.g. peer reviewed) methods (Gibbons et al., 1994). Mode two knowledge, on the other hand, is more "socially robust" (Gibbons, 1999) and is more heterogeneous, reflexive, and interdisciplinary (Gibbons et al., 1994). Though they are often contrasted, mode two and mode one knowledge are not at odds with each other. For example, mode two knowledge is "characterized by a constant flow back and forth between the fundamental and the applied, between the theoretical and the practical" (Gibbons et al., 1994, p. 19). Thus, mode two knowledge can actually serve to extend the reach of mode one knowledge.

Frame and Brown (2008) also further advance Funtowicz and Ravetz' work through their analysis and identification of post-normal sustainability technologies capable of producing mode two knowledge. From their discussion, some hallmarks of post-normal sustainability technologies include: future-orientation, deliberation involving a variety of stakeholders, processes flexible enough to allow for debate and disagreement, and, since it is sustainability focused, room for the growth and development of environmental stewardship. Though the term "sustainability technologies" is commonly used to refer to more concrete phenomena such as electronics or energy generation

mechanisms, Frame and Brown instead use this term to refer to technologies related to social processes. To maintain clarity, scenario development, one of the post-normal sustainability technologies identified by Frame (2008) and the focus of this dissertation, and other similarly socially-oriented technologies will be referred to as social technologies in this dissertation.

Scenario Planning as a Holistic, Sustainability Technology

To further make the case for scenario planning as a crucial post-normal sustainability tool for addressing wicked problems, it is important to first understand what scenario planning is. The current section will briefly describe it, but a more detailed discussion of the specific type of scenario planning under investigation in this dissertation is available in chapter three. In addition to providing an introduction to scenario planning, this section primarily focuses on elaborating on the ways in which scenario planning is important for addressing issues of sustainability, and also how it meets the call of postnormal science.

This section works in conjunction with the three previously explored frameworks. The frameworks, though different in focus, overlap in that they address learning spheres or, in other words, they answer the question of "Where should sustainability action be taken?" Equally important to establishing *where* action should be taken is the complimentary element of establishing *how* action should be taken in addressing sustainability related issues. Below, I discuss three key focal points from sustainability literature that begin to answer this question of how action should be taken. Additionally, for each of the three points identified, I explicate the ways in which scenario planning is capable of addressing the goal of each element.

Scenario Planning as a Tool for Action for an Uncertain Future

Tonn (2007) posits that "sustainability must be infused with futurism" (p. 1098) and that this bond between sustainability and the future is of such importance that it should be given its own term: "futures sustainability." Future orientation's importance to sustainability lies in its contributions to creating a better-prepared society. Past and present actions place society on a specific trajectory. This trajectory must be understood and explored so that it can be corrected, as necessary, in the direction of a path that is more sustainable (Swart, Raskin, & Robinson, 2004). To elaborate, societal actions often have unintended consequences. These consequences create multiple new pathways that can be taken, but if a strong understanding of the past and present is combined with a clear vision of a sustainability future is established, decisions can aid in correcting the course of action towards the desired trajectory (Van der Leeuw et al., 2011). In other words, society needs, "a new kind of approach to social-ecological phenomena... that is not only (1) transdisciplinary and (2) focused on dynamics, but also (3) takes the very long term into account." (Van der Leeuw et al., 2011, p. 2). Given that the future is uncertain, each action brings about new unintended outcomes, which must be met with further iterations. Harnessing this future-orientation in the service of problem solving is challenging at best when the future is uncertain and so specialized social technologies must be used. Wiek, Withycombe, and Redman (2011) call out scenario planning as a critical tool for enhancing this skill, which they refer to as an "anticipatory competence"

(further information on the role that scenario planning plays in strengthening futureoriented thought and anticipatory competence, is available in chapter three).

Scenario planning is well-suited for addressing the construct of "anticipatory competence" due to its process of careful and thoughtful future-oriented deliberation. Though it is often argued that organizations regularly engage in future deliberation via strategic planning, traditional strategic planning methods often look just 1-5 years into the future whereas scenario planning might look 15 to 50 years into the future. Unlike traditional future-oriented approaches, scenario planning does not hone in on accurate prediction of a single representation of the future. Instead, it seeks to identify a variety of future trajectories. It is a "systemic method for thinking creatively about possible complex and uncertain futures" (Peterson et al., 2003, p. 359). Instead of seeking to identify patterns of behavior and predict as a normal science process might, scenario planning seeks to reveal uncertainties and assumptions (Peterson et al., 2003). This process enhances future-oriented decision making through enriching understanding of the future and the role of uncertainty, and also strengthens potential action through providing opportunities for collective and reflexive learning.

Scenario Planning for Addressing Complexity

The complexity and interconnectedness of sustainability problems demand that sustainable solutions to these problems draw from equally complex and interconnected bodies of knowledge. This knowledge is generated in two different ways within the field of sustainability, the first of which is interdisciplinarity. Multidisciplinarity is more common and can be thought of as "stacking" of disciplinary findings and can occur with minimal interaction between the various experts, whereas interdisciplinarity requires a working process between disciplines. The problems faced by sustainability are generally so complex and intertwined that addressing them requires the joining, and not simply layering, of knowledge from two or more fields to solve.

Scenario planning involves group of, often diverse, stakeholders (Bradfield, Wright, Burt, Cairns, & Vanderheijden, 2005) in surfacing and analyzing drivers of change. Typically, this results in a group of individuals with various types of expertise brought together to think critically and collectively on the long-term implications of a shared problem. Together, they work, within the framework of a guiding question, to consider several versions of the future and the factors, or "drivers" (in scenario planning language), that get them there. The process may employ qualitative or quantitative methods (or a combination of the two). Through the medium of scenario building, diverse stakeholders are able to weave their unique knowledge sets together to create a more holistic understanding of the problem and how it might unfold over time. The methodology also limits tunnel vision by asking participants to consider multiple potential futures, rather than just considering the most accessible one. This unique joining of knowledge allows for interdisciplinary collaboration during the scenario planning process and stands as a hallmark of the practice.

Scenario Planning for Pluralism and Normativity

In considering the power of scenario planning to join diverse forms of knowledge, focus should expand beyond expert-driven, "objective" ways of knowing (Ravetz, 2004). Complex sustainability issues also require diverse *joining* of types of knowledge and, in some cases, room for the co-existence of different and perhaps even contradictory knowledge sets. Indeed, this is not a unifying of knowledge but a patterning of knowledge¹ (Kagan, 2011) that acknowledges the normative nature of multiple perspectives. This inclusiveness of normative perspectives is important for shaping the goals of sustainability efforts and objectives (Parris & Kates, 2003; Swart et al., 2004). Additionally, one of the normative values of sustainability is pluralism. Pluralism in sustainability implies that there are many different value structures and, though society cannot necessarily account for all of them, there should be more than just one key measure of sustainability (Spash, 2009). For example, though some people may identify economic success as critical to sustainability, others may prioritize societal or environmental health; thus, sustainability tools should be able to support that type of pluralism. Furthermore, this pluralism does not simply extend between contexts but to different knowledge structures that account of local knowledge as well. Post-normal science also seeks to create a shared learning experience between scientists and laypeople by engaging them in a process called an "extended peer review." In this extended peer review, laypeople function as a broader peer group for scientists and researchers and go through a process of critiquing and analyzing their research and findings (Ravetz, 2004). This process gives laypeople insight into the scientific process and the degree of uncertainty within the process that often is invisible. This process, and other similar processes that engage laypeople, is particularly valuable because, as Frame and Brown (2008) point out, deliberative and participative future-oriented processes, such as scenario

¹ Sasha Kagan has addressed the issue of unification versus patterning by acknowledging that we are not in search of some grand unification of knowledge but that we work to understand the patterns that connect different knowledge sets. This creates a dynamic and ever-evolving process for understanding that is open to the changing of and inclusion of new perspectives.

planning, can and should allow for less academically-oriented types of knowledge systems to have weight.

Additionally, more participative processes allow for multidirectional knowledge transfers to take place, which begins to build skills for adaptation. In fact, incorporation of sustainability-related risks in decision making processes has been identified as important to lessening vulnerability (Smit & Wandel, 2006). For people (both citizens and scientists) to be better able to adapt to sustainability problems and respond with solutions, they first need to be aware of these potential problems and solutions. The inclusion of value structures and local knowledge increases everyone's knowledge sets and thus increases resilience in both the participants and the developed scenarios.

Concluding Remarks on Scenario Planning's Utility

Swart et al. (2004) identifies three critical contributions scenario planning can make to sustainability. First, various types of knowledge, experiences, and insights are incorporated through the construction of cohesive scenarios (or stories). Then, through scenario planning's collaborative process, communication and learning is increased across the various communities represented in the event and provides people with the resources to think more critically and creatively than they would alone. Finally, through the two prior elements (knowledge integration and increased critical thought) potential future risks may be more readily identified and evaluated.

The key elements of scenario planning above identified by overlap with the four elements of post-normal sustainability technologies that were identified (futureorientation, deliberation involving a variety of stakeholders, room for debate and disagreement, and environmental stewardship), with both demonstrating a need for diverse people in deep discourse about their collective future. Scenario planning and the discourse that it facilitates allows for a deeper understanding of how sustainability may or may not be maintained over time (Van der Leeuw et al., 2011). Whether starting from a post-normal technology perspective or a perspective that is solely focused on sustainability, scenario planning is a valuable process for tapping into and valuing diverse perspectives in service of better appreciating the uncertainty within science and the future.

Scenario Planning for Sustainability: Challenges of Participation

The characteristics that make scenario planning such an important tool for sustainability and post-normal science can, potentially, be its weakness. Frame and Brown (2008) state that effective post-normal sustainability technologies "require deliberation on issues to take place in inclusive ways that permit multiple and potentially conflicting views to be aired, understood and considered outside of existing institutions." (p. 229) Thus, unlike many other cutting edge technologies, the pivotal element used within these social technologies is the inclusive and fair balancing of the diverse perspective's held by the people within the system.

Though humans do have vast cognitive capabilities, their ability to judge and evaluate can be hampered by environmental factors (Stewart, 2000). Environmental factors, in this instance, do not refer to "the environment" as in "nature" per se and instead refer to contextual factors. The Stanford Prison Experiment provides an example of the powerful influence environment has on behavior. In this experiment, healthy, male college students were brought to a building. Half were told they were now guards and given the appropriate uniforms, while the other half were told they were prisoners and given prisoner attire. Prison dynamics quickly took hold with "guards" becoming unkind and "inmates" showing signs of distress. The escalation of roles occurred at such a rate that the study had to be halted prematurely (Zimbardo, 1972). Though certainly not as divisive of a process, scenario planning is also vulnerable to the influence of contextual factors. Through investigating social processes through a social psychological lens in this dissertation, a pathway to understanding is established for identifying and exploring vulnerabilities within scenario planning.

Given that social psychological studies have investigated the effects of environmental factors on individual and group behavior, it follows that employing it in service of scenario planning will enhance the understanding of the factors that shape the implementation of the practice. Furthermore, these studies can also serve to analyze the distribution of equity with the scenario planning process, which may focus on a variety of variables including: the actual physical environment the event takes place within, the facilitator of the event, the diversity of participants included in the process, or the influence of the individual participant's personalities and preferences. To get the benefits of scenario planning, it is important that these factors be managed as well as possible.

In the case of using scenario planning for sustainability, in a context of super wicked problems and post-normal science, maintaining the integrity of the process is particularly important because it intends to operate at, and have an impact on, a larger community scale. Since impacts of such scenario planning may be felt across the community, scenario-planning facilitators should strive for a more ethical and inclusive

process, which includes multilateral engagement so that all citizens can benefit. For instance, given the focus within sustainability science on equity, a scenario planning process aimed to increase participation among "low power individuals and groups" need to tend to a variety of social dynamics that influence the context. This is particularly important when you consider that low status individuals and groups, such as the poor, are less likely to be given a chance to speak and exert less influence when they do (Dubrovsky, Kiesler, & Sethna, 1991). This knowledge combined with the International Panel on Climate Change's finding that those with low power (poor, elderly, children) are more likely to suffer negative consequences associated with sustainability problems (2007), demonstrates that, without careful attention, processes such as scenario planning may, indeed, become singular in focus and neglect critical contextual factors that lessen their helpfulness to those that might be most in need (Frame & Brown, 2008; Wallace, 2007). As such, it is not simply enough to invite greater participation. Individuals must also be able to *authentically participate* and contribute to their own future. A more detailed discussion of the importance of participation for sustainability can be found in chapter two.

Since scenario planning is proposed as such a strong tool for sustainability, it is critical to continue to refine it and offer "protection" to potential threats to its effectiveness and to enhance it specifically in service of sustainability.

Moving Forward: Putting the Dissertation in Context

Navigating sustainability challenges is not new. Even Plato tells the story of a land once vital – "full of rich earth, and there was abundance of wood in the mountains"

– but from deforestation the soil was depleted and the ability to sustain life greatly reduced with "some of the mountains now only afford[ing] sustenance to bees." (Plato, 427, Location 210-211). Despite the history of environmental debate, the changing problems faced by society and competing social interests have not necessarily brought society closer to realizing a just, sustainable future. While mainstream audiences, such as politicians and popular public figures and their supporters, have come to a greater consensus on sustainability as a global concern, a better balance must be struck between agreement on shared, desirable future directions and a clearer articulation on how to address context-specific sustainability challenges.

Through the presentation of three frameworks, this chapter posits that sustainability has to occur on three levels: knowledge and understanding, skill building and capacities, and assessment of progress. Furthermore, these three elements are not entirely separate from each other and the relationships can be symbiotic. For example, through the assessment process, researchers may learn that an intervention is ineffective within certain settings. This information would increase our knowledge of the system and potentially lead to the identification of new, situationally-specific skills and capacities. Addressing the complexity of sustainability challenges in a holistic and systemic manner is critical. Society faces "super wicked" challenges that require a post-normal perspective. Scenario planning is a way of navigating the normativity and pluralism necessary for addressing the challenge of an uncertain, unpredictable future by having diverse stakeholders imagine a variety of possible futures in a systematic and rigorous way.

Any participative process is shaped by, and may be potentially derailed by, the contextual factors surrounding the interaction. The group unification that threatens the effectiveness of scenario planning may be the result of some unseen social dynamic at play. Rather than dismiss this otherwise successful and effective future-oriented deliberative technology, steps should be taken to understand and improve it. For this reason, the remainder of this dissertation seeks to critically engage with the process of scenario planning.

Dissertation Outline

After this introduction, the dissertation contains four additional chapters. These five chapters together seek to address two questions: (1) What impacts do social dynamics have on scenario planning for sustainability? (2) Are there actions that can or should be taken in response to this impact? The general structure guiding the flow of these chapters, and the dissertation as a whole, is a funneled, multi-method approach to understanding factors that may impact participation in scenario planning. Individually, each method has its weakness but through layering various methods, balance can be obtained. In other words, "It is the complementarity of field and lab as research setting that contributes to validity, not the characteristics of either setting alone" (Brewer, 2009, p. 14), furthermore, scenario planning is a complex, rich process and necessitates an equally rich analysis – a multi-method approach allows for deeper understanding and triangulation on potential problems.

When considering scenario planning, mixed methods approaches allow for a variety of benefits. The value this dissertation seeks from a mixed methods approach can

be summed up by two justifications identified by Greene, Caracelli, and Graham (1989). First, mixed methods can allow for enhancement of the results from one method by the additional results of a secondary method. This justification, also referred to as triangulation, also allows for the balancing of biases and seeks to engage with the strengths of each approach. Second, they allow for a developmental process, which allows one method, and its findings, to inform the use of subsequent methods. In an effort to tap into these benefits, this dissertation employs three key methods: ethical analysis, participant observation, and an experimental study. The current paper establishes the setting for the following chapters.

Chapter Two

Chapter two is an ethical exploration of participation for sustainability. Though ethics should be a consideration for all areas of research, the general aims and objectives of sustainability endeavors make an ethical critique particularly important. This is, in part, due to the applied, problem-oriented nature of sustainability as well as the normativity inherent in the field. This chapter focuses specifically on exploring the nature of participative processes, a component shared by a variety of sustainability endeavors. The purpose of this chapter, and the analysis contained in it, is two fold. First, I seek to provide insights into elements that may be hindering ethical and just participation. As such, authentic participation is defined and explored and the term "strawman participation" is introduced as a type of non-participation. Second, it provides guidance to this dissertation in two different ways – first by providing a lens for the analysis of social interactions in the subsequent chapters and second by offering high level recommendations for approaching issues of ethics within scenario planning and other participative processes. This chapter establishes important ground work because there is no value in exploring or engaging with solutions that are founded by or generated through methods that are ethically unsound. Ultimately, this chapter helps to clarify important characteristics around participation and explicate conceptual boundaries for the rest of the dissertation.

Chapter Three

Chapter three explores a two-day, energy-focused scenario planning event. Through an ethnographic analysis of the interactions between the 25 participants, I explore the nature of their participation and begin to identify contextual and social factors that may be facilitating or inhibiting participation. This section is important for providing real world validity for the focus area by honing in on events that naturally occur that might disrupt authentic participation. Through a combination of observation and unstructured interviews, social interactions were explored with a specific eye toward social psychological phenomena. This qualitative, observational element is critical to analyzing scenario planning because it allows for the identification of phenomena that emerge naturally from the complex dynamics that are a product of the process.

Chapter Four

One criticism of naturalistic approaches to research is that, precisely because there are so many variables involved, there is a challenge of inference (Elmes, Kantowitz, & Roediger III, 2011) – in the case of chapter three, inferring relationships between social influence and outcomes. The next chapter engages an experimental approach to establish
a clearer understanding of a few key variables. The final stage of data collection and analysis is a pilot social psychology study examining key findings from the ethnography of a scenario planning workshop. Specifically, this chapter uses an experimental design to explore whether explicit knowledge of status difference impacts participation and if individual level brainstorming could function as a potential solution through strengthening the resolve of participants who might otherwise be negatively impacted by status imbalance. Through engaging 24 triads in a simple, and uniform, decision-making task, I control for many potential confounding variables that would otherwise be present in most scenario planning events and allow for a stronger understanding of the focal sources of influence. Each participant wears a Sociometric Badge, a device that gathers various behavioral data, to measure group member participation. A questionnaire is also completed at the end to enhance understanding of participant experience and their individual backgrounds.

Chapter Five

Chapter five, the conclusion, expands back out from the funneling of the previous chapters. It focuses on bringing together the findings of the ethical exploration, the ethnography, and the experimental study together. Through joining the three components in a cohesive manner, I attempt to tap into the benefits of each methodological approach so that a richer portrait can be painted both in terms of the nature of the problem this dissertation addresses and the potential solutions and areas for further research. Additionally, I include recommendations for scenario planning practitioners. Ultimately, I hope to contribute to the strength and effectiveness of an equitable and ethical tool for improving sustainability.

CHAPTER 2

ETHICS AND PARTICIPATION: UNPACKING BARRIERS TO PARTICIPANT ENGAGEMENT

Introduction: Ethical Participation for Sustainability

Scholars have positioned equity as central to sustainability. Gibson's (2006) principles of inter- and intragenerational equity, which were introduced in the preceding chapter, broadly speak to treating current and future generations justly. Additionally, the Brundtland report, though geared toward sustainable development, focuses on "the essential needs of the world's poor, to which overriding priority should be given" (WCED, 1987, p. 43). This emphasis suggests an ethically driven foundation to sustainability with a specific focus on "the poor." Though poverty may be simply characterized via annual income, this chapter uses a more expansive definition which includes, in addition to monetary and resource capital, social position/mobility and freedoms/representation within societal decision making (Rao, 1998). In other words, "the poor" are characterized by both their lack of resources and their lack of power (or degree of marginalization). To advance inter- and intragenerational equity, the poor or marginalized should be engaged in sustainability decision-making that directly impacts them so that their needs can be better understood and met.

Incorporation of diverse perspectives for sustainability is valuable from a moral standpoint and critical to ensuring just and fair treatment of members of society. Each person deserves equal concern and respect, including the power to contribute to conversations that are intended to shape the future. As Anderson illustrates, even small

acts of injustice that create only minor shifts in power should not be ignored, because "Powerlessness is both a cause and an effect of segregation... When state power has been hoarded by dominant groups, they often leverage this power to extend segregation to other domains" (2010, p. 16). Ultimately, incorporation of diversity is, "not to ensure that everyone gets what they morally deserve, but to create community in which people stand in relations of equality to others" (E. Anderson, 1999, p. 289). In other words, there should be procedural justice, or transparency and inclusion for all, within participative processes for sustainability (Agyeman & Evans, 2004). Therefore, the marginalized must be engaged in deliberative processes for decision-making for sustainability, which address both inter- and intragenerational justice.

In addition to being morally just, this inclusion of diverse perspectives is pragmatically worthwhile for more than just those with less power: it allows for the development of a richer knowledge set informed by experiences and values of different subpopulations. First, because sustainability is operationalized "by the problems it addresses rather than by the disciplines it employs," (Clark, 2007, p. 1737) its actionoriented approach focuses on real-world problems. As such, it is important that we consider how these actions impact people to ensure that all people have access to critical sustainability-related resources or, in other words, that there is substantive justice (Agyeman & Evans, 2004). Second, as a normative science it specifically works to address value pluralism (Barrett & Grizzle, 2008; Fung, 2006). This pluralism should undoubtedly include the perspectives of marginalized populations. Often since sustainability issues disproportionately impact vulnerable or marginalized (Mathur, Price, & Austin, 2008), care must be taken to not further harm this population. Since sustainability solutions are future-looking, any inequity we add into current planning may be compounded into the future as well. Furthermore, Shrader-Frechette (2002) argues for Prima Facie Political Equality (PFPE) for both present and future generations as it pertains to environmental benefits and harm. PFPE, as a principle, presupposes that "only "equality is defensible and that only different or unequal treatment requires justification" (Shrader-Frechette, 2002, p. 27). Building from this premise, a specific focus, not only on the inclusion of marginalized populations, but on also promoting their authentic participation is elemental to ethical sustainability engagement. Most important to this chapter, participative processes seek to create democratic discourse that allows for pluralism in perspective. Kates and Parris have put the onus on sustainability science to direct society toward a "just and sustainable future" despite the "tendency of participants in contentious public dialogues to selectively note only the specific trends that support their point of view" (2003, p. 8067).

The Scope of this Chapter

Though the focus of this chapter is on understanding *how* various subpopulations may participate in scenario planning or other deliberative processes for sustainability, it is important to also consider *why* they are engaged, Mathur et al. identify three key rationales to explain why stakeholders would be engaged in a sustainability endeavor: "a management technique; an ethical requirement; or a forum for dialogue to facilitate mutual social learning" (2008, p. 601). Sustainability scientists and scholars do regularly advocate for stakeholder engagement and are making headway in terms of utilization of participation for management and social learning (Kasemir, Jaeger, & Jager, 2003), but a stronger stance may be necessary in terms of the ethic around and within the participative process to ensure that the ethical requirement is sufficiently being met. The reason for this focus is that ethical dilemmas stemming from social interactions may not be as explicitly visible as other challenges.

Specifically, the mechanism of interest in this research on participative processes is social power. "Social power," as defined by Fricker is "a practically socially situated capacity to control others' actions, where this capacity may be exercised (actively or passively) by particular social agents, or alternatively, it may operate purely structurally" (2007, p. 13). In other words, in the case of a participatory dialogue method like scenario planning, the process relies on participants' interactions with others and, as such, there is a potential that, through these interactions, individuals may, intentionally or otherwise, exert power over another, or several others. This is not inherently problematic according to Fricker, who elaborates that social power is a relatively neutral concept, but that "whenever power is at work, we should be ready to ask who or what is controlling whom, and why" (2007, p. 13). Since scenario planning (and other participatory, multistakeholder processes) for sustainability may involve a diverse group with equally diverse motivations, careful attention to the dynamic of social power within the process is necessary. Indeed, Fazey et al. (2014) echo this need for deeper exploration of interdisciplinary stakeholder engagement via multimethod approach due to the complex social interactions central to sustainability problem solving.

This chapter does not fully try to address all of the social power related challenges faced within participative processes and instead focuses on three key areas. First, using two examples of participation for sustainability interventions to ground the discussion, I briefly expand on the broad challenges of participation for sustainability. Second, I introduce and describe a framework for conceptualizing participation, which includes a more targeted exploration of the participative processes and potential sources of injustice in light of social structure, namely oppression. The term "strawman participation" is introduced through this framework in an effort to shine a light on a particularly problematic element of participative processes. Finally, social power is considered through the analytical perspectives of oppression, epistemic injustice, and agency. Through these perspectives, I illustrate the complexity associated with inequity, which is important to understanding challenges that may hinder efforts at increasing equity.

Contextualizing Participation

Though sustainability is interdisciplinary and draws heavily from a variety of disciplines, there are certain elements that are integral to sustainability efforts that may be less important in other disciplines. In this section, I first provide two brief examples of participation for sustainability problem solving. Then, I expand on two of the integral elements of sustainability: its focus on short and long term planning and its orientation toward multi-scalar systemic thinking and how they can complicate participation.

Examples of Participation and Stakeholder Engagement in Sustainability Literature

Within participative processes for sustainability, and participative processes in general, there are many different levels and types of participation that can occur, ranging from simply being allowed to listen to others deliberate, to having an active part in deliberation and decision making associated with it (Arnstein, 1969). These degrees of participation may intentionally vary based on the appropriateness to the situation (Fung,

2006). For example, technical skill building activities may require unidirectional explanation or large-scale, time-sensitive efforts, such as those seen in military operations, which often require more hierarchical interactions. But, not all participation is good participation. As such, it is important to consider how and if participation is effectively meeting the goals of sustainability. It is not simply bringing people together and through a process. It is important to consider the ability to find a medium² to communicate through and to also be aware of how participants understand that medium and if it allows then the ability to participate in an equitable and salient manner. However, assessing the ability of participants to engage is not a simple task. In fact, participants may, themselves, have difficulty assessing their own participation, making perceived success as a poor indicator of equitable participation. This chapter seeks to contribute to this domain by providing contextual understanding of factors that may influence how individuals and groups may experience and engage in participative processes given larger societal factors. It is important, however, to first consider the goals and objectives associated with participative processes for sustainability since objectives contribute to how events are framed and executed (Meadows, 2008).

One common frame for participation for sustainability is often focused primarily on outcomes. For example, Lyons, Smuts, and Stephens (2001) explore the relationship between participation and sustainability. They posit that participation for sustainability is critical and that it functions by way of empowerment. Empowerment, in this context, is defined as, "an increase in influence and control through an acquisition of knowledge and skills" (Lyons et al., 2001, p. 1235), which can operate at multiple scales from the

² "Medium" in this context refers broadly to channels, processes, and tools that could be used to relay information or engage people in information sharing.

individual to the community. This focus on knowledge and skill building is important but may be misconstrued. Though, it is true that skill building may be helpful, it takes a deficiency-focused approach - presupposing that the current skills, abilities, knowledge sets of individuals are insufficient, non-existent, or irrelevant or that, alternatively, the process or outcome goals shouldn't be shifted to reflect the existing focus, in terms of skills and abilities, of the group.

In addition to an outcome-orientation, participatory processes within sustainability also frequently focus on issues related to the distribution of information, namely knowledge transfer and coproduction. Kasemir et al. (2003), for example, focus on sustainable development-based process and are concerned about a broader set of outcomes including climate change policy and transnational planning. Specifically, they concentrate on methodologies for allowing clearer communication between scientists and policy makers and citizen participants, so that all participants and facilitators can extract more from the process. They do, through their analysis, explicitly address a challenge of stakeholder engagement – specifically, when there is a need to have expert opinion incorporated, it should not dominate interactions. As such, the authors expand on two methods for engaging participants in such a way that expert information is available to participants while also allowing stakeholders to explore from within their own knowledge-set. The first event was a traditional focus group supplemented with a collage making activity. The collages allowed citizens to use pictures to create rich representations of their feelings around climate change. The second participative event had citizen participants exploring and interacting with a variety of computer models to

enhance their understanding of how some of the systems related to climate change might play out.

This type of participatory engagement tackles a critical first step, which is to begin to open up dialogue and engagement between diverse groups around complex issues with widespread consequences, such as climate change. Through this process stakeholders may begin to expand their understanding of phenomena that may impact their life. However, many of these processes operate at the group level as well as the individual level. As such, what is happening during this process of group communication becomes important. For example it is worth noting that Kasemir et al. (2003) found that citizen participants, when engaging with one of the models, continued to suggest that pictures would help make the models' outputs easier to understand, potentially indicating that citizens as individuals, and as a subgroup of the larger group, were at a disadvantage in terms of understanding the material presented to them as compared to the academics. Processes must be further tailored to ensure that citizens, and any other categories of participants that may be at a disadvantage, are able to fully participate. Furthermore, though including citizens in these events is important, it is also valuable to expand past the outcome or knowledge transfer focus (or, in certain contexts, expand the focus to include more than knowledge transfer).

The Unique Concern of Sustainability's Long View and the Role of Participation

Sustainability's emphasis on the future is certainly ambitious in terms of the breadth of its focus, which Fischer et al. aptly sums up as conducting:

"critical analysis of foundational and longer-term issues (e.g. values, beliefs and motivations) is needed to link short-term policy actions with agreed longer-term sustainability targets. Such analysis should... reflect on alternative values or institutions, and how they can foster or prevent the attainment of sustainability" (2007, p. 623).

In order to conduct this critical analysis that moves from the present day into the distant future, researchers, planners, and practitioners must speculate – both about future citizens desires and also about the physical and social world that these wants and needs will sit in. We speculate about their world through scenaric thinking tools that possess various levels of structure. Through these processes, we anticipate future citizens' wants, needs, and values using the lens of what we, the present day generation, value. Scenario processes have become a common method for explicitly engaging a variety of stakeholders on these issues.

Scenario planning is a particularly strong tool in this context as it allows groups to think critically about the future but it also has the potential to mobilize people and groups in the present. Scenario planning is proposed as an important tool for sustainability because of its ability to address issues of the future while incorporating diverse perspectives. However, scenario planning and other future-oriented processes still engage authority and expertise for decision making and it is unlikely that all expertise is treated equally. For example, Oborn and Dawson (2010) found that even in a group of decision makers from a cancer team with a relatively flat hierarchy of expertise (all medical doctors) that certain types of expert opinions were given deference over others in terms of patient care and treatment, namely surgeons over oncologists. Though chemotherapy is very important to the treatment of cancer, it was the surgical interventions that were viewed as more heroic. Thus, higher status or preference is not necessarily ascribed based on utility or expertise alone. Involving key individuals, those who may belong to a subpopulation of society that is granted less power, in scenario planning processes is a first step, but ultimately their values and brand/style/configuration of expertise should get equal consideration as the majority perspective. It is not that those of lower power need to "get their way" but that they should be able to fully participate in the conversation.

Indeed, despite the strengths of scenario planning, predicting the needs of future generations is a challenging task that involves relying on present day people to serve as representatives or fiduciaries of the future. Speaking for future generations, however, is not an unprecedented occurrence. In fact, regulatory steps have been made to recognize legal standing for future generations. One of the first example of such actions occurred two decades ago when legal action was taken by a environmental organization to preserve old growth forests on behalf of Philippine children (Allen, 1993). The courts ultimately ruled in favor of preserving the forests for the children as well as for the good of future generations. Since then, efforts have been scaling up to higher levels; various countries have added intergenerational justice to constitutions while others have created governmental organizations to address this concern, and even the United Nations has laid the groundwork to form their own, similar organization (Orr et al., 2014). As Allen (1993) and Orr et al. (2014) demonstrate, society often accepts the shortcomings of present day society and allows them to make decisions to address intergenerational needs despite the uncertainty associated with the future.

The Systemic Nature of Participation and Sustainability

A core characteristic of sustainability is its approach to addressing problems through a holistic approach (Backstrand, 2003; Van der Leeuw et al., 2011; Wiek et al., 2011). Important to taking a holistic approach is analyzing sustainability's tools and solutions systemically. As such, it is important to think of scenario planning both as a system in itself and as a piece within a larger social system. There are two key components that are particularly import to draw out of the systems literature. The first is "interconnections" which refer to the relationship between the pieces or players in a system, often in the case of people this comes in the form of what Meadows (2008) calls "information-based relationships" and refer to how knowledge is passed between individuals and organizations in order to guide their decisions and actions. Applied more specifically to scenario planning, the interconnections may relate to a variety of elements: how the event came to be planned, who was invited to attend, how people decided whether or not they would participate, etc. The second is "functions" (or purposes) which is the actions or outcomes of the resulting system (Meadows, 2008).

Specifically, Meadows states that, "purposes are deduced from behavior, not from rhetoric or stated goals" (2008, p. 14). In other words, if interconnection refers to how people/things come together or don't come together, then purpose/function refers to the what. Applied to scenario planning for sustainability, we may acknowledge that the stated goal of scenario planning is to involve a diverse group of stakeholders in future-oriented discourse but the function performed, or in other words the nature of the process, may be quite different. In other words, being able to check of a list of tasks does not guarantee that the goal of equitable participation has been met.

A Historical Example: Goals versus Function. It can often be challenging to fully reflect on and appreciate the systemic nature of an event (and the role of power dynamics) when one is a part of the zeitgeist, thus I choose to draw from a series of events that occurred well over a century ago³. The Dawes Act, passed in 1887, may perhaps provide an illustration of the role of function versus goals within a system and its impact on the marginalized. The act redistributed reservation land to Native Americans on an individual, rather than group level, and, in the process, granted them U.S. citizenship ("Dawes Act," 1887). It had immediate negative consequences for the Native American populations. Much of the original land holdings were lost by 1933 and they have never returned to their pre-1887 level.

In the present day, it is commonly accepted that this act was poorly planned and extremely detrimental to the Native American population. However, at the time of inception, in addition to the governmental initiative, humanitarians seeking to help Native Americans improve their lives bolstered this act (Prucha, 1984). In fact, they drew on an ethical underpinning to support these actions – assimilation of the native population as a way of lifting them up toward the level of the white men (Haas, 1957) and freeing them from "oppressive" tribal leaders (Stremlau, 2005). Though they may have genuinely believed they were helping better the lives of Native Americans, they did so without full understanding of context and implications - that it broke up the culture and tribal community and that it made it easier for white men to take land away. Furthermore, some Native American individual's were so indoctrinated that they also had begun to believe

³ It is interesting to note that this is not exclusively an occurrence of past times. William Cronon (1996) draws a parallel between the attempted expulsion of the indigenous population of the rainforest in more recent years with the expulsion of Native Americans from their land in the 1800s.

that they needed to abandon their traditional way of life as well (Stremlau, 2005). This last point is particularly important to sustainability endeavors, because it demonstrates how a marginalized population may support something that may ultimately work against their best interest due to the opinions and influence of those in power.

Conceptualizing Participation for Sustainability

This section focuses on explicating a framework for understanding participation (Figure 1). This framework was informed by Arnstein (1969) and her seminal work on citizen participation (Figure 2). In this work, Arnstein (1969) introduced the construct of a ladder of participation. The very top rung of her ladder is "citizen control," which is placed as the ideal form of participation. The ladder provides a type of hierarchy for participation with more participation being ideal, or higher on the ladder, and less participation being less desirable, and lower. More recent research has asserted that there is a situational element to this ladder. Fung (2006) argues that high levels of citizen control are not inherently better or always appropriate. He does state that more robust citizen participation *is* necessary when those in charge are lacking in the skills or knowledge necessary to make the decisions alone. That may be true for certain types of participation, but in the case of future-oriented sustainability discourse scientists, practitioners, and policy makers are, in fact, looking for participation that fully engages the stakeholders because decision-makers are ill-prepared to fully address issues of sustainability, not due to shortcomings on their part, but due instead to the elements of uncertainty and complexity that make sustainability a wicked problem (Frame, 2008) (further discussion of sustainability as a wicked problem is available in chapter one).





Figure 2. Ladder of Participation (Arnstein, 1969)



My framework of participation involves the interplay of two key variables. The first is "decision making," which refers to whether or not participants are granted access to engage in a purposeful context. In other words, genuine effort is made by facilitators and organizations to include a diverse group of stakeholders in a deliberative process. Involving stakeholders is not enough to guarantee a fair solution though (Hildyard, Hegde, Wolvekamp, & Reddy, 2001). In the case of sustainability, this may occur either by way of ensuring that there is diversity in who is invited to attend the participative event or by taking what would normally a unilateral decision and opening it up to a transparent, participative process⁴. The second variable is "participation" or "active participation." This refers to the ability of the participants to genuinely engage in the process without undue influence. It would be incorrect to make the following assumption: *Simply having people in the room for a session or event is proof that they have been allowed to participate.* It is, perhaps better proof of the first element, that gatekeepers are willing to invite them in.

In the upper left quadrant of the framework is "explicit exclusion." This refers to situations in which participants are entirely left out of both the decision-making and participation is only occurring within a select group. An example of explicit exclusion is a unilateral decision being made on behalf of others.

Below explicit exclusion, in the lower left quadrant is "token participation." Token participation was coined by Arnstein (1969) and it refers to situations where people are allowed be present and participate but actually have no voice in decision making. An example of token participation might be a town hall meeting where people are allowed to voice their opinion on a matter but ultimately leadership decides on the issue.

"Strawman participation" is in the upper right quadrant and is the opposite of token participation. The "strawman" here is not used in the context of a "straw man proposal," which refers to a simple proposal intended to provide a starting framework

⁴ For the sake of this framework, it will be assumed that the first criterion from gatekeepers is met and that there is diversity and transparency within participative processes for sustainability.

from which to work, but is a reference to the "straw man fallacy" or "straw man argument" in which the opposing perspective is weakly represented so that it may be easily knocked down (Talisse & Aikin, 2006). In the same way that a flimsy opposing argument may be erected, "straw man ethics of participation" is one that involves a flimsy structure of participation; it merely meets an assumed criteria that individuals joined as a group are democratically participating. Therefore, in the case of strawman participation, people are invited to engage in decision making, but there is a barrier – either *overt* or *covert* – still preventing them from actively participating in the process. Such a construction would be particularly unethical in that, to outsiders, it would appear as though a variety of people were consulted and that there was rigor in design when in fact there was not.

Through the understanding of strawman participation and token participation, a better understanding of the final quadrant emerges. If token participation arises from not being granted decision-making power and strawman participation is the result of participation barriers, then "authentic participation" is participation in which individuals and groups are granted decision-making power within the participative setting and are engaged in such a way that they are able to act genuinely upon that granted power.

In particular, individuals should be free to participate without hollow influence. Hollow influence, in this context, refers to influence for influence's sake. It is when someone simply wants to get his or her own way. This would be put in contrast to honest influence, which is when people are advocating, in a fair way, for their point of view. Unfortunately, when it comes to issues of privilege and oppression, those with privilege have been found to be more assertive with their perspectives and, in turn, wind up better

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received by others. When individuals speak, regardless of their status, others should actively listen and consider what the person has to say.

Oppression: A Systemic Barrier to Authentic Participation

Power imbalance can manifest in subtle forms such as trust and deference to authority. For example, Zarnoth and Sniezek (1997) found that sub-groups significantly influenced the larger group decision if the sub-group members displayed high levels of confidence in their intellect. Of course, being highly educated or, perhaps more accurately put, simply feeling sure of your intellect (regardless of what the reality may be) does not make an individual infallible but confidence and perceived authority can give them more power to influence. While the degree of participation, the role of power imbalances and the influence of authority figures are important characteristics of most group interactions, scenario planning's explicit focus on the future raises unique and peculiar issues in relation to influence.

Since scenarios are the products of imagined futures, influence of authority and trust in authority acts as a surrogate for truth (Selin, 2006). It should not be assumed that individuals or groups afforded authority have built 'better' scenarios than what the whole group is capable of creating. The issue can become a less diverse number of scenarios built on the ideas and experiences of a small group of individuals. Furthermore, the mere presence of authority can be enough to "change opinions, even when no arguments for the opinions themselves were provided" (Asch, 1973, p. 18). If these scenarios lead to actions that disadvantage a less powerful subgroup than the problem has transitioned from social influence to oppression. In fact, oppression can be defined as "a social

injustice that is perpetrated through practices, norms, and other types of institutional arrangements on one or more social groups" (Marti & Fernandez, 2013, p. 1198). As a type of social power, it may occur through active or passive means (Fricker, 2007). Regardless of the mechanisms, it can hamper the abilities of individuals to genuinely contribute to group interactions, or in other words, various forms of oppression may prevent participation.

In the case of broader sustainability issues, facilitators and planners seek to fold a variety of perspectives, insights, needs, and wants into how we think about and act toward the future through the use of diverse groups in participative processes. Such participative processes are employed because they offer a variety of potential benefits to all participants. Van de Kerkhof and Wieczorek (2005) identify three benefactors to participative processes associated with sustainability transitions: scientists, policy-makers and citizen-stakeholders. Potential benefits from participation range from winning over the public to engaging the public in a group learning process to enhancing large scale decision making through increased inputs (Elzinga, 2008). There are, of course, other potential pitfalls associated with participation, including deciding who gets to speak on behalf of others. While it is difficult to say with certainty that chosen, or self-selected, participants are the best representatives, picking stakeholders that are affected by the proposed actions may help minimize the chance of missing valuable information.

Nevertheless, if participants are selectively noting their preferences it follows that these biases can only be counteracted by a diverse group of stakeholders that will speak to the pluralism that sustainability strives for. However, poorly organized participation that involves laypeople mixed with "professionals" often serves to reinforce power

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imbalances (Mayo & Taylor, 2001). Despite the challenges of operationalizing oppression, it is imperative that researchers and practitioners seek to understand and address oppression in terms of participation. If power imbalances are not addressed, with steps taken to neutralize them as much as possible, then groups are not actually engaging in authentic participation but instead are engaging in strawman participation. What's more, these participative processes are often precursors to future action with unclear implications for how these processes might play out. A lack of rigor in participation may further reinforce oppression, thus it is important throughout sustainability endeavors to strive toward inclusive, authentic participation.

A Framework for Understanding Oppression: The Five Faces of Oppression

The "Five Faces of Oppression" framework (Young, 1992) provides a context for further understanding how strawman participation occurs. Often, the initial image of oppression is a "bad" person or group, often unlike one's self, directly and maliciously dominating people. However, oppression is not so cinematic and is most likely to occur within "everyday practices of a well-intentioned liberal society" (Young, 1992, p. 41).

Young identifies five different types of oppression that may occur in different permutations dependent on the group in question. The types of oppression are: exploitation, marginalization, powerlessness, cultural imperialism and violence.

Exploitation refers to the "transfer of the results of labor of one social group to benefit another" (Young, 1992, p. 49). Though common examples of this may be slavery or sweatshops, division of labor within marriages may represent a subtler example of this. Though women now work as much as men, they continue to contribute more to household and child-based responsibility (Bird & Fremont, 1991). Men have also shown a trend of increasing levels of happiness correlating with the increasing participation of women in the workplace, while women have shown a decrease in happiness (Krueger, Kahneman, Fischler, & Schkade, 2009).

Marginalization occurs when a group of people is blocked from societal participation. This may result from a variety of factors including language barriers and limited mobility (which then limits access).

Powerlessness involves being unable to participate in decision-making, not being treated with respect, and otherwise being unable to develop and grow one's self. Relevant to the focus on creating a sustainable future, a group that is often powerless is children and the unborn. Though these future generations may be heavily impacted by decisions, there are many structures in place preventing their ability to actively participate in society.

Cultural imperialism occurs when dominant group's cultural norms and practices are positioned as normal. Cultural imperialism is often subtle. Medin, Bennis, and Chandler (2010) explore the role of cultural imperialism in psychological research. The majority of research typically begins in the researchers home country and then extends out to other countries. The initial research is the point of comparison for all additional research and any country that varies from this is the source of deviation.

Finally, oppression via violence may range from actual physical harm to verbal attacks to emotional or psychological harm. This includes simply the threat of violence, as well. Important to note within this framework is that more than one type of oppression may occur at the same time. Taking the example of illegal immigrants in the United States, it is likely that all five types of oppression are at play due to their illegal status, whereas children simply lack power.

Ultimately, the Five Faces of Oppression framework draws attention to the complexity of oppression, particularly through the identification of a variety of types of oppression and different combinations and permutations that may occur within the five types of oppression identified. Since there is no standardized oppression, no group is oppressed in the same way, the solutions, therefore, are also not able to be standardized. Additionally, due to the systemic nature of oppression, changes from actors 'at the top,' or those with power, is not enough since one "cannot eliminate this structural oppression by getting rid of the rulers or making some new laws, because oppressions are systematically reproduced in major economic, political, and cultural institutions" (Young, 1992, p. 41). Furthermore, this embedded nature of oppression is particularly problematic because it results in the internalization of such oppression by the people operating within the system. There is no need for a tyrant because the momentum of the system is sufficient. The following remark in a speech by Jesse Jackson (1993) demonstrates how pervasive assumptions based on a foundation of systemic oppression are: "There is nothing more painful to me at this stage in my life than to walk down the street and hear footsteps and start thinking about robbery. Then look around and see somebody white and feel relieved." As a civil rights activist, striving for racial and social equality, he is still impacted by the internalization of issues of oppression despite the strong beliefs he holds around equality.

It would not be a realistic objective to discuss removing oppression from society entirely, or even from the scenario planning process. This is true for two reasons. First, as

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just noted oppression is embodied as a result of cultural learning; it is unrealistic to expect to eliminate individual and group history. Second, some hierarchical structure within society is necessary for maintaining order. With any hierarchical structure, there is a possibility for power to become systematically imbalanced. Thus, addressing oppression becomes an act of continued reflection and management. Furthermore, when considering oppression it is necessary to understand the diversity of environments that various participants live and interact within. Despite the inability to "fix" oppression, it is still important to consider the influence it might have and engage in a process of managing it. Specifically, it is important to be aware of how we may be triggering oppression or inadvertently folding it into future planning.

When considering strawman participation through the lens of the Five Faces of Oppression framework, it becomes apparent that it is a more difficult type of challenge than token participation due to the relationship between strawman participation and oppression and the potential for it to be invisible to some or all participants. In strawman participation, oppressed individuals may not be aware that this is happening or, worse yet, may attribute their own lack of participation to perceived personal shortcomings. For example, one may think, "I didn't really speak up because I don't really know that much about the topic. Other people seemed to know far more" (In fact, a similar sentiment was voiced by a participant during the scenario planning workshop discussed in chapter three).

Allowing more knowledgeable people to speak may seem like a prudent course of action, but "seeming" more knowledgeable is not the same as genuinely being more knowledgeable. In a study of incoming STEM majors, MacPhee, Farro, and Canetto (2013) found that female students, a minority group in these disciplines, rated themselves lower in terms of academic efficacy than their male counterparts, when in actuality there was no difference between the two groups' academic performance. In other words, perceived efficacy may effect how participants mediate their participation because they do not view themselves as being capable of being knowledge generators. Furthermore, dialogue around the roles participants play may impact how they interact in the group. For example, someone that has positional dialogue that revolves around problem solving and action taking may be privileged over someone who's description is more closely tied to mitigation or management (Oborn & Dawson, 2010). The potential for participants, particularly socially marginalized participants, to succumb to forms of systemic oppression presents a troubling dilemma: involve them in the process but then they are not authentically heard.

Another danger within strawman participation is in hearing the marginalized voicing others' beliefs, due to their disregard of their own knowledge, and the facilitator gives validity to this voice even if they don't understand the underlying influence on the person's comment. They may then move forward with more confidence, thinking that have properly heard all those involved. The trouble here is best represented by the Mark Twain quote, which states, "It's not what we don't know that gets us in trouble, it's what we know for sure that just ain't so." If decision-makers become confident that all participants have expressed their true values they run the risk of moving forward with the false assumption that a desired pluralism has been achieved. The authentic participation that robust sustainability solutions demand requires a close attention to the role systemic oppression can play in fostering strawman participation.

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Epistemic Injustice: Structural Barriers to Participation

As the prior section on oppression demonstrates, it should not be assumed that simply taking people out of their normal settings and inserting them into a "neutral" or "open" environment will result in them suddenly shrugging the burden of society from their shoulders. Every person brings their social learning in with them and this impacts the way they treat others and the way they comport and censor their own behavior. The current section focuses on one specific implication of systemic oppression that impacts participants abilities to interact with knowledge and operate as sources of knowledge.

This is tied to a version of strawman participation that was not identified earlier, which may be somewhat more likely to be addressed (and potentially imposed) by a facilitator. This occurs when everyone is allowed to speak and chooses to do so but not all comments are equally regarded because some participants are not viewed as being possessors of knowledge. This delineation as lacking in genuine knowledge is referred to as epistemic injustice (Fricker, 2007). The two key forms identified are "testimonial" and "hermeneutical" injustice. Testimonial injustice occurs when an individual gives a speakers word less credence because of a judgment of them. The individual may be judging the speakers perceived "expertise" (particularly indirectly, in terms of social class and educational attainment) and/or making judgments based on stereotypes or prejudices. This is often easier to identify than hermeneutical injustice.

Hermeneutical injustice refers to how certain concepts may not exist within certain societies. This may be particularly problematic in sustainability discussions because baseline understanding is critical to ethically moving forward when normative considerations are central to proper action. As people are brought in to discuss issues framed in conceptual and linguistic ways that makes sense to the organizer or key participants, they may be engaging in a conversation that has little value, or even meaning, to certain participants or subsets of participants. An example of this may be as simple as taking a conceptual approach to considering a topic with a participant who typically works with more concrete and less theoretical information, as would be the case if the participant were a designer or a floor layer. Not only can this be disengaging to this subset but can actually hamper their ability to participate in an informed way.

Similarly, a facilitator may use tools to engage participants that privilege certain populations. Graphs and charts, for example, are often identified as good ways to distribute and share information, but the cognitive demand requirement is much higher from someone who does not typically view graphs or has not previously had a need to visualize this type of information. The anecdote from Kasemir et al. (2003) in which participants expressed a desire for pictures to go along with the computer modeling outputs, may gesture toward citizen participants' attempt to rectify a hermeneutical injustice being enacted during that event. Though it is important to use available tools to enhance understanding, it is important for facilitators to consider the ways in which tools may limit the authentic participation of already oppressed participants. In other words, using inaccessible tools may also contribute to strawman participation.

Ultimately, strawman participation can be seen as inadvertent negligence as a direct result of both structural barriers and systemic oppression. As such, it is then important to consider means of addressing issues of strawman participation so that people and their respective contributions could be treated equally.

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Agency in the Face of Oppression

Considering the different configurations of agency within marginalized communities is identified as particularly critical to sustainability endeavors (Dale & Newman, 2008; Mathur et al., 2008; Tschakert & Dietrich, 2010). Agency, "the socioculturally mediated capacity to act" (Ahearn, 2001, p. 112) is a critical component of participation and is, indeed, what Lyons et al. (2001) and Kasemir et al. (2003) are striving to move toward through their respective interpretations of participative processes. Agency, discussed within sustainability and environmental literature in terms of empowerment or perceived efficacy (Clarke & Agyeman, 2010), manifests as a complex interplay between the thoughts and behaviors of individuals and social structures they are part of (Cleaver, 2001). Enhancing or supporting a sense and manifestation of agency, however, is not a simple task and linkages between participative processes and empowerment can be oversimplified when discussed in the context of structuring participative events.

Various forms of power imbalance and oppression are interwoven throughout society and the lives of individuals to such a degree that individuals are sometimes conditioned to oppress themselves. To further illustrate this point, Young (1992) wrote an important essay on throwing like a girl. She begins with an excerpt from Doctor Erwin Straus, a pioneer in several different fields including medical anthropology. In his writing he compares the mechanics of four and five year old girls throwing a ball to similar aged boys. He notes that even at such a young age little boys wind up and throw with their whole body while little girls throw in a more controlled and restrained fashion. He attributes this to biological variation. Iris Young offers an alternative explanation – these children are moving so differently because by the age of five they have already internalized the gender roles and expectations put on them by society. In other words, by as young as four, girls have learned not only what society expects of them, but also how to oppress themselves even in the absence of instruction. The oppression, in this case, comes from the embodiment of gender stereotypes. The activities that boys and girls participate in, and are socialized around, at such a young age have already taken effect in their very physiology. What's more, it is so engrained in Straus that he does not see how he has embodied the imbalance himself. Therefore, while steps may be taken to increase a sense of agency and empower individuals to take action, it does not remove them from the structures and histories of oppression or from making decisions from this place of oppression.

Another challenge to increasing agency of marginalized communities, that is particularly relevant within the sustainability sphere where work is often conducted internationally, is that perceptions of agency may vary from culture to culture and within research areas as well (Ahearn, 2001). For example, Townsend (1995) was working and researching with rural Mexican females. In an effort to help create further economic security, researchers wanted to help the women by helping them to get work outside of the home. Ultimately, what the women desired was a way to stay at home and work, even if that work was more tedious and would not bring in as much money. In this way, the researchers' understanding of what would give the women a sense of economic agency were at odds with the desired outcomes of the women. Cultural variation in the manifestation of agency creates a challenge when dealing with participative processes that engage diverse groups: supporting agency within one social context may not support agency in other culture contexts.

Ultimately, for participation to be just (and, likely, for it to be most effective), and in turn for a sense of agency to be advanced, it must take into account the histories of the participants that may impact their participation or, in other words, the "non-project nature of people's lives" (Cleaver, 2001, p. 38). To further complicate the issue, feelings of agency may likely exist alongside oppression because "oppressed people often cannot afford to feel powerless" (Mahoney, 1994, p. 62). Indeed, when we consider a secondary definition of agency that provides context for sociocultural mediation, it becomes clearer. Agency is "temporally constructed engagement by actors of different structural environments... which, through the interplay of habit, imagination and judgment, both reproduces and transforms those structures in interactive response to the problems posed by changing historical situations" (Emirbayer & Mische, 1998, p. 970). In other words, though people may be granted agency, they may still have difficulty deploying this agency due to epistemic injustices still at play within the system or the internalization of oppression.

Returning to the Framework of Participation, it may appear that increasing agency is the "answer" to the problem of strawman participation. This is not unreasonable; if strawman participation is caused by oppression (the inability to act within societal bounds) and agency is the capacity to act, then it stands to reason that enhancing agency would improve participation. However, as Ahearn cautions "the main weakness in treating agency as a synonym for freewill is that such an approach ignores or only gives lip service to the *social* nature of agency and the pervasive influence of culture on human intentions, beliefs, and actions" (2001, p. 114, emphasis added). Ultimately, as this section illustrates, enhancing agency is a critical step forward in creating an environment that can foster authentic participation, but the challenges and complexity associated with agency must not be overlooked.

Conclusion

In planning for the future, we have created processes that allow for more involvement from various stakeholders. This involvement allows for a more holistic understanding of the system or world in which these participants live and in turn a stronger ability to plan for a more sustainable future. However, authentic participation from all included is required for these processes to be effective and fair. Simply incorporating marginalized community members may not be enough to get them to participate authentically and may, in fact, result in further marginalization of already underserved groups.

Authentic participation is important not just to the ethic of sustainability but also to the efficacy of sustainability solutions. Lyons et al. (2001) found that the ability of participation to lead to sustainability was moderated by the degree of empowerment of the participations by way of skills and engagement. Working to develop participants skills and increase engagement is a laudable and necessary task, however, this is one facet of the interaction dynamic we see at play. Though one can increase agency in participants, the systemic nature of oppression may still be at play in their actions and cognitions, still rendering authentic participation unattainable. Designers and users of participative processes are generally aware of the need to balance participant involvement

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and include in their designs elements intended to elicit just participation such as turn taking, individual brainstorming time, or small group interactions. However, inequality is not something that is easily removed or even easily recognized. There are explicit forms of inequality that might be easier to recognize, such as the exclusion of or denial of legal rights for certain groups. There are also less visible, perhaps more ingrained, forms of inequality that may escape the eye of even the most well-intentioned facilitator. While, oftentimes, the onus falls upon the facilitator to ensure that participation plays out justly that unfairly presumes them to be impervious to the effects of social power. With the various forms of barriers that are possible to the process of participation, achieving authentic participation is a daunting task, but a critical linchpin to effective deliberation. Therefore there is no choice but to continually strive toward more authentic participation.

There are no clear-cut or simple solutions to issues of oppression and marginalization. There are broad steps that can be taken to reach more just, participative actions. First, though researchers and practitioners may have processes in place to create more equitable participation, they should never assume that all solutions work equally well for all people. Since people and groups are never oppressed in the same way (Young, 1992) and sustainability solutions and tools cannot be one size fits all (Ostrom, Janssen, & Anderies, 2007), sensitivity to the dynamics at play are critical to navigating the continuously evolving social interactions. Becoming aware of and using the Framework of Participation offered in this chapter, as well as the constructs of "authentic participation" and "strawman participation," can help facilitators engage in reflection before, during, and after events and allow for clarification of the nature of participation taking place. Second, related to the first point, always assume that more can be done. By continuing to observe and potentially collect data, practitioners and facilitators can work to improve not only the level of interactions but also the number of ideas that each participant has to contribute. Third, educate your participants. Cialdini, Sagarin, and Rice (2001) found that, through educating subjects about unethical influence, the subjects were better able to resist such influence. Similarly, facilitators may be able to strengthen the resolve of participants to participate genuinely through giving them not only skillsets for participating but also an understanding of oppression and the importance of authentic participation in the process. Throughout these events, there are two main factors at play: the exertion of will from other members (influence) and the ability (or inability) of the individual to exert their own will. I do not suggest that influence is the same as oppression, but that education may be helpful in moving toward balanced exchange of input. Finally, it is necessary to continually reflect on the process and the impacts of participative processes for fairness after they have concluded. Ultimately, these four points suggest a reflexive, iterative process of participative process design and implementation.

Since sustainability has an action-oriented, long view, the decision points derived from scenario planning or other participative processes have the potential to be incorporated implicitly into the future, via individual or group mental models, or explicitly into the future, via strategic planning. Regardless of the means, there is possibility for unchecked injustices that initially play out in the processes to continue to resonate into the distant future. Therefore, researchers and facilitators must cultivate authentic participation with an eye towards social power and oppression.

CHAPTER 3

THE ENERGY WORKSHOP CASE STUDY: AN EXPLORATION OF THE ROLE OF SOCIAL INFLUENCE AND POWER IN SCENARIO PLANNING

Introduction

In chapter one, scenario planning was introduced as a critical post-normal science tool for sustainability. This chapter expands on that discussion and provides a deeper look at scenario planning, situating the practice as important for sustainability, and detailing the objectives and methods of scenario planning. Specifically, this chapter delves into how social influence and group dynamics manifest in scenario planning and with what implications. In order to illustrate such dynamics and their effects, this chapter analyzes a two-day scenario-planning event in terms of the social interactions that occur between the various participants, facilitators and guests. The chapter concludes with implications and next steps for research.

Origin and Role of Scenario Planning

Scenario planning is a tool designed to enhance strategic planning. It operates through a process that engages groups of people in serious consideration of a range of possible futures (Schoemaker, 1995; Swart et al., 2004). It is often used in conditions of high uncertainty regarding future events in order to improve decision-making (Godet, 2000). In particular, scenario planning has been identified as an important tool for addressing the wicked problems associated with long term sustainability issues (Clemens, 2009). Broadly speaking, this tendency toward decision making based on future-oriented, scenaric thought is familiar to most. Setting aside money for potential future needs is often the result of consideration of a variety of future possibilities – your car breaking down, buying a home, putting a child through college, etc. Scenario planning is set apart from its more informal cognitive counterparts by its ability to bring this process of futureoriented deliberation into collective awareness through structured, deliberate, and relatively transparent conversation. In other words, scenario planning's structured process serves to allow participants and facilitators to "decompose complex phenomena into more analyzable subsystems" (Schoemaker, 1993, p. 194).

This structured, group-level approach to scenaric thought originated from two critical venues: war time planning and the company Dutch Royal Shell (Shell). In the first case, scenario planning gained traction as a simulation tool for armed forces in the 1940s as a response to narrow-minded planning that left troops vulnerable and leadership scrambling when military operations did not go as planned (S. T. Ross, 1997). Kahn, the inspiration for Stanley Kubric's Dr. Strangelove, championed the use of scenarios within the RAND Corporation and brought this discussion - "thinking about the unthinkable" to a more mainstream audience, including policy makers and the business community, in the 1950s (Bradfield et al., 2005; H. Kahn & Aron, 1962). It was the second push, led by Pierre Wack, however, that was responsible for cementing its popularity as a tool for corporations through strategic planning for Shell in the late 1960s and early 1970s (Bradfield et al., 2005; Schoemaker, 1993). Corporations, as well as governmental entities and non-profits, have now used it for over 40 years in their strategic planning to build capacity and enhance organizational decision-making under uncertainty. This dynamic process helps organizations account for the potential directions they may move into, facilitating future adjustments - for resource use or accumulation, research and

development, infrastructure changes at the physical and social level – and, ultimately, making an organization more resilient and adaptive to disruptions and unexpected changes in the market. The utility of scenario planning has been punctuated by its widespread popularity, with a 2006 study showing that 70% of businesses were engaging in scenario planning ("Scenario Planning," 2008).

The reach of scenario planning continues to spread, with the public sector beginning to adopt it for addressing a variety of planning and community issues (Bartholomew, 2006; Moats, Chermack, & Dooley, 2008; Ratcliffe & Krawczyk, 2011). A diverse knowledge-base is frequently identified in planning literature as a requirement for further reducing uncertainty and adapting to change (Bijlsma, Bots, Wolters, & Hoekstra, 2011; Walker et al., 2002). The knowledge-base, in this case, refers broadly to a variety of types of knowing, which includes expert knowledge but also incorporates knowledge gained from experience, often referred to as local knowledge (Raymond et al., 2010). Combining diverse experiences as well as exploring divergent understandings of the same experiences can directly allow for a richer understanding of systemic elements through synthesis of the various experiences or can indirectly enrich through exploring questions raised by discrepancies in experiences. Such diversity can be obtained in scenario planning through the use of heterogeneous groups that include experts from various fields but may also include community members as a mean to access local knowledge, experience, and preference. However, it is important to note that, as discussed in chapter two, it is possible for social dynamics to hinder authentic participation in groups, which would result in a loss or shrinking of this knowledge base to only include the dominant participants.

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As discussed in chapter one of this dissertation, scenario planning is particularly well suited for the field of sustainability because of (a) its future orientation and (b) its ability to incorporate important normative elements. Sustainability's future orientation combined with the complexity of systemic sustainability issues requires a process that is capable of dealing with high levels of risk and uncertainty. Mitigating future vulnerability, as sustainability seeks to do, does not require perfectly accurate prediction when looking toward the future, but does require individual and collective consideration of alternative futures (Sarewitz, Pielke, & Keykhah, 2003). Thus future-oriented methodologies, such as scenario planning, play an important role in sustainability through their ability to reduce vulnerability to unexpected disturbances (Bradfield et al., 2005).

Since sustainability is typically described as a "normative science," (Mulder, Segalàs, & Ferrer-Balas, 2012; Robinson, 2004; Vucetich & Nelson, 2010) there are assumed preferences and values operating within the research and decision-making practices. Scenario planning is credited as meeting many of the normative characteristics that are critical for sustainability (Gibson, 2006; Wiek et al., 2011). For example, democratic processes are often identified as fundamental to development and sustainability work and is included in the eight key principles of sustainability established by Gibson (2006) that is often referenced by sustainability scholars. Gibson describes democratic decision-making as more transparent and better informed and states that such collective work also leads to collective responsibility. Such shared responsibility is critical to sustainability because the size and scope of problem solving often requires concerted top-down and bottom-up efforts (Mulder et al., 2012). This democratic process is particularly important to those with the least resources, those of lower socio-economic status, as they tend to be impacted by the brunt of negative environmental outcomes (Brooks, Adger, & Kelly, 2005). Scenario planning can quite literally increase democracy, as was the case in the Mont Fleur scenarios, in which one of the explicit objectives was to increase democracy in post-apartheid South Africa (Kahane, 2010). More broadly, it can make processes more democratic. In this context, the democracy that Gibson is referencing is participatory democracy which hinges on the act of stakeholder or citizen deliberation (Andersen & Jaeger, 1999). Notably, through scenario planning's long view and its incorporation of diverse stakeholders' experiences and knowledge, not only can decision-makers develop a richer understanding of the system, but they can also support the normative and democratic values often seen as inherent to sustainability.

Scenario planning also proves useful for what Gibson (2006) identifies as the principle of precaution and adaptation, the ability to anticipate and respond to potential negative events, and the principle of intragenerational equity, or fairness within the currently living generation. The benefits that scenario planning offers in terms of precaution and adaptation is tightly linked to the need for a diverse knowledge-base. Through the inclusion of multiple perspectives, there is a reduction of potential blind spots often incurred from single perspectives. Each participant, pulling from their experience and knowledge set, creates a redundancy in the process that helps account for unforeseen events. As scenarios are developed, individuals can point out occurrences where unforeseen events took place and how he/she dealt with that dilemma. By pulling from these experiences, this can further mitigate the future uncertainty regarding future events. Likewise, when considering issues of intragenerational equity, those most able to speak for future generations are those most likely to empathize with their potential plight.

Diverse stakeholder groups increase the potential for scenarios that are inclusive of different backgrounds and socioeconomic classes. These deliberative planning processes help account for events that affect stakeholders in diverse and unforeseen ways.

Scenario planning is, thus, capable of serving as a tool for sustainability that offers unique benefits while also addressing several of the key principles. Worth noting, however, is that the challenge within any democratic group process is ensuring that it is actually operating democratically and does not just appear to be operating democratically. A group may fall into the latter category if powerful individuals or group dynamics intentionally or unintentionally hijacks the process. Scenario planning has an advantage, when employed as a democratic process in service of sustainability, since it was developed explicitly to compensate for flaws in group or individual process - its primary focus being the lessening of the rigidity of mental mapping, tunnel vision, and unrealistic optimism (Schoemaker, 1995). However, its effectiveness at addressing these broader issues of the individual and the group has not been thoroughly measured empirically. Additionally, while many complex psychological phenomena, such as tunnel vision, anchoring, and framing, are explored within the scenario planning literature (e.g. Bradfield, 2008; Schoemaker, 1993, 1995), the treatment is superficial. Furthermore, a different set of contextual factors come into play, factors that are seldom addressed in the literature on scenario planning that is dominated by business and the managerial sciences. In particular, though it may be argued that organizations are implicitly focused on being "sustainable," this sustainability is regularly approached through the lens of profitability, which leads that the effectiveness of scenario planning must be measured on a scale of increased market share. When we consider sustainability at the level of social equity,

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effectiveness is instead established by way of fair and just participation. Therefore, it becomes critical that we develop an understanding of processes that assist or create barriers to equality within the scenario planning process.

The Purpose of Scenario Planning

Scenario planning stands out because of its explicit focus on the group and its ties to improved decision making processes (Chermack, 2004), which has been linked to a degree of improved fiscal success as a result of better organizational performance (Phelps, Chan, & Kapsalis, 2001). It is intended to strengthen decision making, but its success often hinges on the effectiveness of the group's interactions and participation therefore these variables must be thoroughly understood so that said variables don't hamper the effectiveness of the planning process. Participants are asked to think creatively and divergently about the future while also incorporating their unique experiences and knowledge, any interaction that hinders this process, such as social influence might prevent people from accessing or sharing this information limiting scenario planning's effectiveness. Since this process relies heavily on facilitation and group interaction, it is critical that it be evaluated thoroughly in terms of its success at giving an equal voice to all participants. This research has as its core mission to strengthen the understanding of how these social influence phenomena may impact planning in this setting.

As previously mentioned, the goal of scenario planning is to directly address barriers to effective decision making that stem from human factors. Below, I elaborate on three of these barriers: tunnel vision, optimistic bias, and groupthink. Though tunnel vision and optimistic bias are important within the context of scenario planning, they are more cognitively-based and have received more attention through research (see Franco, Meadows, & Armstrong, 2013; Meissner & Wulf, 2013; Schoemaker, 1993); as such, I focus more on groupthink as it aligns with the lesser-explored social psychological focus of this dissertation. For each, I provide an explanation of how these typically operate and how they can resurface, with the purpose of clarifying some of the phenomena that scenario planning addresses and also as a means of drawing attention to the complexity associated with them.

Tunnel Vision

Informational tunnel vision, in psychological terms, is the process of narrowing options as part of a decision making process. Some of this narrowing is useful, however, it should occur after options or considerations have been appropriately weighed. It is the premature occurrence of tunnel vision that can lead to ill-informed and, possibly, incorrect decisions (Porter, ten Brinke, & Gustaw, 2010). A. Miller (1982) specifically identifies tunnel vision as a challenge to good environmental planning, thus strengthening the importance of this process to sustainability.

While scenario planning seeks to address tunnel vision through encouraging the consideration of various factors (Phelps et al., 2001; Schoemaker, 1995), it is worthwhile to note that it is often a characteristic of indecisive individuals (Rassin, Muris, Booster, & Kolsloot, 2008) meaning that certain people may be more resistant to efforts to curb tunnel vision or may experience greater anxiety. Group interactions may make indecisive people more confident, but it may also create overconfidence in other individuals and the

group as a whole (Patalano & LeClair, 2011), this dynamic, as with all complex processes, presents itself as a double-edged sword.

Optimistic Bias

Sharot, Korn, and Dolan (2011) found that, when faced with information that challenged their beliefs, participants were more likely to change their beliefs when the information was better than expected as opposed to when information was worse. This tendency to favor positive outcomes, or outcomes that favor you and/or your position, is known as optimistic bias. Interestingly, when faced with making assessments of similar others, as opposed to ourselves, we often make more realistic, and less overly optimistic, assessments (Helweg-Larsen & Shepperd, 2001). Optimistic bias, much like tunnel vision, also varies within the individual. For example, those who perceive that they have a higher degree of control over their futures are more prone to optimistic bias (C. T. F. Klein & Helweg-Larsen, 2002). Conversely, individuals who experience mild depression are more likely to make more realistic evaluations than those without depression or those with more severe depression (Soderstrom, Davalos, & Vazquez, 2011).

In terms of outcomes, optimistic bias functions similarly in decision making as tunnel vision does, in that it creates blindspots in planning. Though optimistic bias can be improved through scenario planning there are situational and individual level variations that are capable of hindering (or helping) the process. Interestingly, studies have found that high socioeconomic status individuals are more likely to feel in control (Bosma, Schrijvers, & Mackenbach, 1999) and are less likely to experience depression (Everson, Maty, Lynch, & Kaplan, 2002) than their low socioeconomic status counterparts. Thus, if those with higher status are more likely to feel in control, which is linked to more optimistic bias, and are less likely to feel depressed, which also correlates with optimistic bias, then it stands to reason that a scenario planning process involving predominately high socioeconomic status participants may be particularly vulnerable to optimistic bias.

Groupthink

The third challenge scenario planning seeks to address is groupthink (Bodwell & Chermack, 2010). "Groupthink" describes a phenomenon where "the members' striving for unanimity overrides their motivation to realistically appraise alternative courses of action" (Janis, 1982, p. 9). "Group splintering" is a term used to explain the disintegration of groups into smaller offshoots (W. A. Kahn, 1995). K. Van der Heijden (2000) elaborates on the benefits and challenges of each in the context of planning. According to him, consensus is critical to stronger group mental models which is, in turn, important to stronger group action. However, such cohesive groups tend to lean toward "business as usual" thought processes. As such, some splintering, or fragmentation, is necessary to introduce a broader scope of ideas/possibilities. Too much splintering depletes from the ability to have clear group action and results in each pursuing action that aligns with their personal motives. Furthermore, van der Heijden posits that the unique contribution of scenario planning is its "focus is on steering a middle way between fragmentation and group think" (2000, p. 36).

Ideally, scenario planning would permit groups to effectively function at the "just right" point between group splintering and groupthink, but it would not be a simple task. Of particular concern are the effects of groupthink. The "bystander effect," (Darley & Latane, 1968) a specific category of groupthink, should be explicitly drawn to the forefront when considering action-oriented futures discourse. Frequently referenced in the context of emergency situations, "bystander effect" explains the inaction of the individual as a response to the presence of others whereby each person observes the inaction of those around them and assumes that action is not warranted. Bystander effect situated within the frame of scenario planning could result in participants dismissing their own ideas because "if it were important someone would have already mentioned it." It is an implicit, rather than explicit, form of groupthink. Groupthink, in general, is more likely to occur when there is group cohesion, external threats, and uncertainty and risk in decision-making (Gladstein & Reilly, 1985; Mullen, Anthony, Salas, & Driskell, 1994), it is a means of deescalating increased tension, which actually might serve to further hinder effective scenario planning.

Maintaining a degree of tension and engaging in constructive disagreement is necessary for the generation of imaginative ideas (Kurtzberg & Amabile, 2000). Though the scenario planning process attempts to address groupthink, such a process that explicitly deals with uncertain and potentially risky futures is going to be vulnerable to the threat of groupthink. In situations where uncertainty is low and group cohesion nonexistent, individual's responses are still significantly modified by the presence of others even if the group is acting against logic and the risk to the individual is imminent and potentially high. For example, in a study where students were left in a room while smoke was piped in, those who sat in the room by themselves were more likely to seek help then were three students seated together – even when the participant had the added responsibility of being with two children they were still less likely to seek help (A. S. Ross, 1971). If no one else acted concerned, the participants would simply continue to sit in their seats, outwardly calm, despite the potential risk that is inherent in a room filling with smoke. This body of work illustrates how it is possible that, in a situation with straightforward cues and no relationship between participants, individuals still rely on others for behavioral prompts. Such findings necessitate consideration of whether scenario planning processes breaks up existing group dynamics sufficiently or if new groups may form throughout the process. It is possible that the efforts made by scenario planning to eliminate groupthink is countered by the re-formation into groups in response to focusing on a future imbued with risk, threats, and uncertainty. In fact, scenario planning has been describe as imperfect for this task, due to a perceived tendency to unify the group engaged in the process (Wallace, 2007).

Though scenario planning has taken steps to minimize the effects of groupthink, social norms and authority, it is unclear how successful these steps are. Additionally, there may be other, unexpected threats via social-interaction to the effectiveness and justness of the future-oriented planning. It is important that all participants be allowed to authentically participate, participate with decision making capability and free from social barriers, so that they can benefit from the process and that the process can benefit from their input (a full exploration of "authentic participation" is available in chapter two).

Relevant Studies on Psychology in Scenario Planning

There are other habits of thought and challenges to group interactions that may occur within the scenario planning process, and some research has explored various phenomenon. Franco et al. (2013) developed a potential framework of cognitive styles, with the intent of using it to harness variation in cognition for scenario planning. Employing it would allow individuals with certain propensities to take the lead at points in time that align with their abilities (Franco et al., 2013). Schoemaker (1993) conducted a series of experiments that explored key psychological elements of scenario planning. Specifically, he explored how scenarios could be used to overcome blindspots that are caused by various cognitive phenomena. However, one challenge associated with this series, and experimental design in general, is that he used a simplified process and studied participants primarily at the individual level rather than the group. This is perhaps the most problematic, as the group interaction is of critical import to the scenario planning process.

In contrast, Meissner and Wulf (2013) conducted a group-level study examining the effectiveness of scenario planning to overcome the framing effect. "Framing effects" occur when individuals' decisions vary based on the way information is presented, though the content of the information does not change. Their study explored the variation between a control group, a group that used scenario planning, a group that used only a fragment of scenario planning, and a group that used a different strategic planning method. They found that the full scenario planning session was most effective at removing the framing bias. However, they did find that other strategic planning methods also removed the framing bias. Results also showed that the scenario planning group reported better decision quality than the other groups across all metrics, which included estimating effects on organizational performance and overall decision quality. Bradfield (2008) took an important step in analyzing scenario planning events through a detail-rich observational study of cognitive challenges during the scenario planning process. Most strikingly, Bradfield found that the scenarios that were developed "largely matched the collective belief systems and previous experiences" of the participants (Bradfield, 2008, p 209); this is notable considering how van der Heijden (2000) asserts that such "business as usual" future thought is associated with groupthink, which scenario planning is intended to minimize. Interestingly, Bradfield (2008), Schoemaker (1995), and Meissner and Wulf (2013) used graduate students in their studies. Though this may allow them to address individual variations as it pertains to cognition, it may not be as adept at identifying group-level challenges; though there may be some variations in terms of group status, the hierarchy among graduate students is relatively flat.

In this research, I seek to extend the reach of these, more cognitively-focused, works of Bradfield (2008) and Meissner and Wulf (2013), through examined empirical phenomena associated with social interaction. Furthermore, I use a more hierarchically diverse group than one might see in a graduate level course. More specifically, I explore challenges of the group that may still occur during the scenario planning process and undercut the effectiveness of the process. This project explicitly addresses the question: What are the main sources of influence in the energy planning workshop? Through this analysis I focus on exploring where influence arises in the scenario planning workshop and how it impacts the process in terms of group focus and individual participation and contribution.

Understanding Influence in Group Interactions

The focus of this study is to shine light on psychological factors tied to social power that may potentially be impacting scenario planning, namely social influence.

"Social influence," the focal point of this study, is "change in behavior caused by real or imagined pressure from others" (Kenrick, Neuberg, & Cialdini, 2007, p. 186). Social influence is important to creating order or efficiency where there might otherwise be chaos; however, similar to the dynamic between groupthink and group fragmentation, an overabundance of order or efficiency can be problematic. Within certain contexts, chaos or disorder, on a small scale, is necessary. For example, in the case of scenario planning there must be enough order present so that participant knowledge is appreciated and applied, but temporary disorder must also exist due to the important role it plays in the learning process. It is an opportunity to suspend judgment and question mental models, ultimately helping spawn creative ideas that can be validated later in the process. Social order, as supported by social influence, can operate in such a way that it may support active participation or it may hinder it. It changes the manner in which people act and also the way they interpret reality, thus it is important to identify and account for potential sources of influence during the scenario planning process so that the grouplearning benefits of the scenario planning process are not hindered by dysfunctional group dynamics.

Social influence is a normal, integral part of human relationships and is, therefore, interwoven throughout all interactions; as such, it has the potential to be very impactful. Social cognitive theory provides a helpful lens for understanding this. This theory, established by Bandura (1986) states that there is a bidirectional relationship between individual's learning and characteristics, environmental characteristics, and behavior. In other words, the behaviors of those around us influence not only our behaviors but also our thoughts, and conversely our thoughts influence our behaviors and the thoughts and

behaviors of those around us. Through the lens of this theory, this study focuses on how contextual characteristics, in this case external influence, interact with individual characteristics to impact individual behaviors and thus the potential to positively or negatively impact group outcomes.

Social influence as a human adaptation is often beneficial. For example, having authorities in the form of trusted experts allows others to rely on the expert's knowledge base so that they do not have to also become specialists on a topic in order to make an informed decision (Carolan, 2006). Similarly, individuals may also look to peer groups, or individuals who have been in similar positions, when making choices. Goldstein, Griskevicius, and Cialdini (2007) found that people are more likely to reuse towels when told other guests in the hotel do it. Additionally, Cialdini (2003) found that people are less likely to steal petrified wood if they know that very few people engage in this practice. In sum, social cues from other actors extend the breadth of information available and can support societally appropriate and beneficial behavior.

However, there are also ways in which social influence can have negative outcomes. Individuals can look to peers, making choices easier, but there are times when easier, or more efficient, choices are undesirable. One specific way social influence may play out is via the presence of an authority (Cialdini & Goldstein, 2004). Though again authorities are necessary, the strength of an authority may extend past what is reasonable. In an experiment, Milgram (1974) found that a "researcher" could get about 70% of his participants to continue shocking an unseen other to dangerous levels using the simple phrase "for the sake of the experiment, you must carry on." Notably, the participants were told right from the onset that they could stop participating at any point in time.

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Beauvois, Courbet, and Oberlé (2012) replicated the now-famous Milgram experiment and found that even if a person was an authority figure that was *not* an expert, in this example a game show host, participants were just as likely to demonstrate obedience and willingly engaged in behavior that they believed was delivering potentially harmful electric shocks to another person. Though electroshock is generally not used in scenario planning, these studies illuminate how individuals can behave in ways they normally would not.

Social influence may, of course, play out without the presence of an authority. The Asch (1973) conformity studies found that when placed amid a group of confederates instructed to state that two very different lines were the same length, 70% of participants agreed with them. It could be argued that they were simply choosing to agree, but in a more recent study, Berns et al. (2005) gave participants a similar, computer-based task while using functional magnetic resonance imaging to observe brain functioning; they found that the area of the brain responsible for perception activated during conformity. This finding suggests that conformity does not simply occur at the surface level, but that individual's perceptions actually shift during the process.

Following the group or an authority has the potential to be problematic in any setting, but there are also concerns that are of particular importance to scenario planning. Processes that ask us for more creative and divergent ideas may potentially suffer at the hands of social influence. When working in groups, people are more likely to follow one idea deeply or generate ideas that align with other group member's ideas (Kohn & Smith, 2011). On the other hand, individuals working independently to brainstorm are more likely to develop a broader range of ideas (Paulus, Larey, & Ortega, 1995).

Though facilitators of participatory processes often have an explicit focus on equality and inclusion, no interaction is free of social influence. Social learning and influence help individuals adapt to the rules and norms necessary for navigating society, but it is often not possible for an individual to identify the influence being exerted on him or her, let alone to discern benevolent forms of social influence from less well-meaning forms. Social influence is addressed because there is a need to engage in an authentic participative process and thus must acknowledge the dynamics in this endeavor. The intent is to have an engaging and open dialogue but, for that to happen, there must be an understanding of potential pitfalls. This study explores the social dynamics in scenario planning processes.

Event Overview

The scenario planning event chosen for observation was one two-day workshop of a larger three-day conference held on a large Arizona university's campus in March 2012. The conference was dedicated to exploring diverse ways of embodying the future. The scenario planning session, one of nine workshops, was focused on the future of energy in Arizona. An experienced organizational development consultant used a process informed by Global Business Network (GBN) methodologies to facilitate it. She was supported by a visual recorder, a note taker who used a combination of pictures and words to represent the group's discussion. Additionally, there was a video documentarian present who filmed the process with an intermittently used, handheld video camera. Though participant numbers varied over the two-day workshop, there were ultimately 25 participant stakeholders involved. The majority of the participants were men with only 6 female participants. Though 18 of the participants were currently working in academic positions, 7 participants were not. Of those 7 participants, 4 were graduate students, one was an incoming graduate student, one was a post-doc, and one was a representative from the government. The group was brought together to address, "What is the future of energy for Arizonans in 2050?"

The process followed the same basic process of GBN (Scearce & Fulton, 2004), developed at Shell, sometimes called the intuitive logics approach and codified in Kees van der Heijden's influential book The Art of Strategic Conversation (2005). It began with orienting the participants through providing background information on the focal issue and introductions. They then identified driving forces, which are elements that are expected to have a strong impact on future events. These driving forces are typically particularly uncertain elements that are hard to predict or predetermined elements that are in motion and difficult or impossible to stop (Peterson et al., 2003). They did this through a process of individual brainstorming followed by group discussion and concluded with voting for the key drivers. During this process key drivers were also discussed in small groups and more clarity was gained on what they were – this included redefining or lumping various drivers together. The third stage is a synthesis stage. Through pairing high-ranking drivers, "sample" two-by-two scenario matrices were developed for participants to try out in self-selected groups. The sample scenarios were tested to see if, when played out, the results that emerged from each quadrant were plausible and interesting (by "interesting" this meant that as a whole the matrix was usefully tied to the focal question or, more broadly, to the objective of the event and that each quadrant within the matrix yielded unique results). From here, the participants shared their

scenarios and discussed. Based on the discussion, the group selected one scenario framework to develop and explore further. They then separated into four smaller groups and each group was responsible for fully developing one quadrant. From there, the groups shared out with the other groups the final scenarios for the quadrants. Though an abridged version by some standards, this event does represent a common methodological approach in terms of the design of the phases and thus the study of the process should yield findings applicable to other settings.

Data Collection Method

I used an ethnographic, observational method to conduct this study. Data was gathered by means of collaboration with a group taking documentary-style video footage. Since using multiple data collection methods allows for a richer understanding to be developed (Fetterman, 2010), I used a combination of field notes, interviews, video, and photographs with the primary sources being the video and field notes. My field notes included detailed descriptions of the setting and interactions, as well as observational comments (Emerson, Fretz, & Shaw, 2011). In addition to observing the events, I used unstructured interviews to supplement observations and gain more clarity on internal processing. When interviews were used, questions were worded in such a way as to not create a "desired answer." For example, if I was interested in asking the facilitator, "Do you think this process is going slower than usual?" I would instead ask, "How do you feel this process is going so far as compared to past scenario planning exercises?" Enquiring in this manner while using open-ended questions was intended to prevent the questions from unintentionally leading participants. More importantly, it also provided an opportunity for fuller information to be obtained because, through asking vague questions, participants are left with an opportunity to provide a rich description and potentially address a concern or observation that the researcher had not originally considered (Fetterman, 2010). Ultimately, these varied data sources were used to create a "thick description" of the scenario planning workshop. "Thick description," a term coined by Ryle (1968) and popularized in cultural research by Geertz (1973), refers to a research method of "both describing and interpreting observed social action (or behavior) within its particular context... Thick description accurately describes observed social actions and assigns purpose and intentionality to these actions, by way of the researcher's understanding and clear description of the context under which the social actions took place" (Ponterotto, 2006, p. 543). Through creating a thick, or rich, description of this scenario planning workshop, a more robust and nuanced understanding of the social dynamics was possible.

The development of this thick description began with the analysis of fieldnotes, which was conducted using Dedoose, a qualitative data analysis tool, to support in drawing out key themes. The method of analysis used a three part process informed by Emerson et al. (2011). First, I began by using an open coding method in which I made notes on small chunks of text (often events or occurrences). These codes were broadly informed by my interest in social influence and group interactions, but were not specifically directed toward any specific phenomena. Second, I reviewed both the field notes and my coding to identify emerging themes. Finally, I used a closed coding method informed by the identified themes to further analyze the data. The video footage was analyzed separately. The documentarian had gathered a series of small clips, ranging from under a minute to about five minutes in length. For the approximately twelve hours of workshop there was about five hours of video. The video footage followed a similar three-part process as the fieldnotes with two exceptions. First, it was analyzed after the fieldnotes so the video analysis was informed by the fieldnote findings. Second, because of the intermittent nature of the video, it could not be used to provide a rich timeline of the day, but rather as a rich data source for events. Often recording from a different position from where I was sitting, it was used to provide further context of events and also fuller understanding of physical response in participants during these key events.

Throughout this process, there were three main questions guiding my analysis. Q1: How were participants responding as a group, or subgroups, to the scenario process in general? Q2: How were participants responding (or not responding) to the actions and words of others, including facilitator, guests, and fellow participants? Q3: Are there any pronounced instances of social influence playing out throughout the event?

Findings: Inside a Scenario Planning Workshop

Setting the Stage

The workshop began after a half day plenary session intended to set the stage for thinking critically and creatively about the future. Presentations from university scientists covered a variety of topics from military technology to artificial limbs controlled by the mind. Through the presentation of ongoing and projected innovations, facilitators and speakers were fostering a mindset for creating dialogue. Conference participants were then released to join one of the simultaneously run workshops. Though the other sessions certainly provide rich insight into social influence and group dynamics, this analysis focuses on the scenario planning workshop. Specifically, what follows is a thick ethnographic description of the event where I pluck out findings relevant to this study on scenario planning, participation and social influence. As part of this thick description, I employ a combination of direct quotes from participants, in italics, as well as first-person narratives of anecdotes that I observed. Additionally, I provide contextual understanding by infusing analysis in with the observations.

The workshop seating consisted of a series of tables arranged to make a large Ushape. There was a small box and a projector sitting on a small table in the void in the center of the U, a large white screen at the front of the room lit up by the projector made explicit where the front of the room was. This layout was ideal; semi-circle and u-shapes encourage balanced interaction between all participants by allowing everyone to see and converse with each other and any presenters easily (Rees, 2005). Though seemingly trivial, one has only to consider the traditional conference table layout and the hierarchy it creates, with the individual seated at the "head" being granted the most power (Rees, 2005). Both of the side walls in the room were covered by giant sheets of paper – estimated to be 6-8 feet long and about 4 feet tall. As I looked at the sheets and wondered about their intended purpose, a small woman with salt and pepper hair came in with a large box filled with a rainbow of markers, colored pencils, and other drawing tools. She opened the box and began working – in no time a windmill emerged as well as the words "Welcome to part two." Turning, she noticed me and introduced herself as the graphic recorder. Her job, she explained, involves summarizing through the use of words and

visuals the discussions from the workshop – not only to serve as a stylized version of meeting minutes but also to serve as a visual summary for participants to refer back to throughout the workshop.

The meeting kicked off with one of the organizers setting the tone. He mentioned the large numbers of energy-focused innovations and how they are presented in terms of an energy future for Arizona without any human context. The charge he gave to the group was to re-insert people into Arizona's energy future.

Though I previously described the scenario planning process at the high level, in order to provide further context for the analysis, below is a more concrete description of the major activities the participants went through over the course of the day and a half workshop, the scale at which they worked, and the approximate duration of each activity:

1. Welcome and introduction (60 minutes) – Large group

This included an introduction or stage setting for the topics, as well as having all participants, including facilitators, introduce themselves.

2. Discussion of the focal question (30 minutes) – Large group

The discussion of the focal, or guiding, question gave the opportunity for participants to establish a shared understanding of their workshop objectives.

3. Brainstorming session of the driving forces (75 minutes)- Large group This process involved participants voicing various potential drivers that would impact the future of energy for Arizonans while the facilitators recorded these ideas on postit notes which were then stuck to a wall at the front of the room.

4. Identification of key driving forces (15 minutes) – Individual level

This was a relatively simple process. During this time participants were given stickers. They placed a sticker next to any drivers that they felt were most uncertain or critical.

5. Clustering and naming of final drivers (90 minutes) – Small groups The drivers receiving the most votes during the previous step were pulled out of the mass of brainstormed drivers. They were then placed, in isolation on the side wall. Participants then clustered any of the remaining drivers under the "winning" drivers. Finally, they reviewed the clusters of drivers and renamed the top driver, if necessary, to encompass the various elements.

6. Test drivers against each other in 2x2 matrices (75 minutes) – Small groups Each small group was given a matrix to explore, which were created by joining two of the previously identified drivers. They were supposed to look at both extreme ends of the driver (For example, if the driver was "Innovation," they would explore what a world with high innovation might look like and what a world with low innovation might look like).

Discussion of the matrices (75 minutes) – Large group
In order to establish a final 2x2 matrix, participants discussed key elements of the quadrants they previously explored in their small groups.

Narrative development (75 minutes) – Small groups
Participants were divided into four groups. Each group was responsible for developing a compelling narrative for one quadrant of the final 2x2 matrix.

9. Gallery walk (90 minutes) – Small groups

During this portion, the small groups rotated from station to station to learn about each of the four narratives.

10. Discussion of next steps and presenting data (60 minutes) – Large group During this period participants reflected on how they benefited from the process and discussed how their scenarios would be shared with outside people.

Successes

I would be remiss if I did not acknowledge that which was positive within the scenario planning process. The event was successful in bringing together a diverse group of people. The two lead participants used their influence to make a push for openness to ideas and acceptance

"You are going to be hearing things from people who have a different perspective than you and, from time to time, things are going to not ring true to you from your background... but that doesn't invalidate them – in fact, more than likely its an opportunity for you to broaden your perspective."

Many had never met before and of those who had met, they often made comments about not previously having had the opportunity to speak with one another at such length.

The participants were also working through conflict together. For example, there was a point of contention that participants were struggling with. One participant seemed a little frustrated but calmly and articulately provided clarifying information on how energy policy in Arizona functioned, while another participant attentively received the information. As she processed it, instead of meeting it with defensiveness, she exclaimed, "*Ohhhh. I'm incredible sorry that I made that leap in logic.*" They would often follow

this format of disagreeing on a topic, analyzing and exploring the source of contention, and either arrive at a new understanding or, occasionally, as one participant put it "*agree* to disagree." The event was regularly peppered with comments expressing surprise at newfound information: "*This is interesting*!" "*Really*? *I never heard that*!" "*Thanks for the rich debate*!" "*I'm learning a lot*!" Additionally, individuals were also seen exchanging business cards – suggesting a potential for future collaborations or deepening of support networks.

However, the impetus of my observation into this scenario workshop was to identify areas for further research, as a means of increasing understanding and potentially improving the scenario planning process, as such I have primarily focused on issues where social dynamics related to social influence surfaced, which may make the event seem plagued with problems. The intent is not, however, to detract from the commitment and hard work of participants who dedicated twelve or more hours over the course of two days to this process. Many participants stayed late to accomplish tasks and, though they were at times frustrated and at times quite tired, they maintained positive attitudes throughout – cheering for the arrival of coffee and making lighthearted banter. For example, one participant quipped during the process of selecting drivers, "*If my idea does not get chosen, should I feel bad about myself*?" To which another one quickly replied, "*You should and – because you've become attached to it – you should avidly, relentlessly defend it*!"

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The (Potentially) Derailing Effect of Group Culture

Group culture can have unique effects on process. Over the course of the workshop, the participants repeatedly expressed concern about whether they were "asking the right question." Indeed, from the beginning participants were suggesting many ways in which they wanted to add many layers of refinement to the base question of "*How will Arizonans produce and consume energy in 2050?*" Some points of contention included:

"We should add strength to the question"

"We should stay mindful of the normative commitments that we are making in answering this question"

In fact, there was such a focus on getting the question correct that it created frustration in at least one participant who asked in exasperation, "*Are we going to keep talking about the question or answer it*?"

This specific scenario event's dynamics resulted in an unexpected type of group culture, which may not replicate within any other group, maybe not even within other academics. This need for refinement also occurred during the process of naming drivers. For the various drivers, suggested names were always met with criticism:

"Its not necessarily about that."

"Well, that's one part."

"There's another layer to it."

Though people had stayed attentive during the analysis of the focal question, once this analysis continued for the drivers, some participants seemed to disengage. In addition to

many regularly checking their cell phones, two people pulled out their laptops and one pulled out a tablet and began working on other tasks.

Again, this also continued during the process of exploring potential drivers and one group seemed to be stalling. Though, they had been in their groups for approximately 10 minutes, they still had not written anything down. The facilitator approached them and reminded them not to "*make it more complex than it needs to be.*" At this point, one of the group members turned to her and said, "*But we do. We do need to make it complex.*" The facilitator began to reply, "*I know that and that is why I am asking you not to…*" but before she could finish her sentence the group returned to their conversation. She stated again, "*Try not to make it complex*" – they did not reply, already engrossed in the process.

There was a potential that this degree of analysis was typical to the scenario planning process, but in a follow up interview, the facilitator noted that this wasn't a typical sticking point in scenario planning. Without prompting, she also attributed this particular challenge to the high proportion of academics present. The graphic recorder, also possessing decades of experience with the scenario planning process, offered up a similar observation stating that she felt that the more academic nature of the group was resulting in a "*much bigger struggle than most groups had*" that related to "*difficulty letting go and being creative and more focus on analyzing and getting things right*." Similarly, a post doctoral researcher who had been involved in scenario planning before observed that this group was "*over-intellectualizing the driving forces*."

However, if in any group a dominant culture forms, a problem is that not everyone will necessarily fit within this majority and thus an outgroup will likely form. During lunch, I began speaking with one of the participants who was unique in that she is not affiliated with the university and also not an academic. I asked her how she was finding the event thus far. She paused before replying, "*Well… I bite my tongue a lot. I want to keep trying to ground the conversation or make it more practical. You know, I'm a climate change agnostic. Everyone else seems to be accepting climate change as a given. I have to avoid engaging my perspective in the conversation because I know that it will not be fruitful.*"

Though her standpoint may have been an unpopular one in the room, it was still a view that is representative of a significant subpopulation of society (only 12% of the population denies climate change but 30% of the population believes it is not caused by human factors and less than half of the United States see global warming as direct threat to their lives and communities (Leiserowitz, Maibach, Roser-Renouf, Feinberg, & Howe, 2012). Furthermore, not only is stifling unpopular viewpoints problematic to the scenario planning process, but it may also disenfranchise the out-groups in terms of engagement and investment in the shared future created by the group.

In the last example, a shared belief was responsible for the creation of in-groups and out-groups, but a secondary manner in which group cohesiveness may alienate outsiders is via shared languages or thought processes. For example, I asked one particularly quiet participant how she was finding the process. Here is how she replied:

"I am really enjoying it.... But it is really difficult to engage in the conversation as an engineer. Everything is so abstract and my field tends to engage with more concrete concepts. I think I'm learning a lot... I just don't really know what to contribute." This is particularly valuable information. Scenario planning effectiveness relies on the diverse expertise and viewpoints of the participants. If conversation occurs in such a way that participants with different but relevant viewpoints are unable to find a means of engaging then that form diversity in the room is effectively inaccessible and lost to the process.

The Resurgence of Authority and Cohesive Groups

Through breaking up existing groups and the formation of new groups, as well as challenging existing mental models, scenario planning seeks to challenge existing authority structures. However, there were some occurrences that suggested that authority and power dynamics re-formed quickly within this new group and certain members were regarded with more respect than others. There were some very explicit examples of status and power acknowledgement. One participant, during introductions, described the participants in the room by stating, "*You've got some generals here*…" – while gesturing toward a corner of the room where more advanced career participants were sitting – "… *and you've got some privates*…" – while gesturing toward himself. Then he looked toward the area where four of the graduate students were clustered and said, "*and you've got some…*" At this point he trailed off.

There were also more subtle demonstrations of authority dynamics playing out. For example, a graduate student wanted to contribute an idea and before doing so expressed their intention by asking, "*Can I add to that*?" In contrast, a higher status faculty member shortly thereafter stated, "*I'll add to that*." Though it had the same intent, the graduate student asked permission while the faculty member did not wait for permission. This may seem to be an issue of semantics but during engaging debates, those that did not jump in often were not heard. During exploration of drivers, one graduate student was attempting to bring up a point, during the time it took her to express hesitation with, *"but... ummm,"* the two high status participants on either side of her, had leaned back so that they could see past her and jumped into a discussion.

The question then became how did these dynamics get established in such a short period of time – the entire process took approximately twelve hours total over two days. This may have been the result of the group being comprised of academics that were overrepresented in terms of affiliation or expertise in the area of policy. Introductions, in the United States in general, tend to include description of work or titles, which allow people to establish authority and status, or at least develop some concept of a pecking order. During this group work process, it was noted that status - originally acknowledged during introductions - resurfaced as a means by which to emphasize a point or lend strength to an argument or otherwise use their positions of authority as "proof" that their opinion was to be respected. This was done not only in reference to expert authority but also status-based positions to lend weight to their argument. For example, one participant would use their affiliation with powerful politicians to strengthen stances with phrases such as, "I've got governors calling me!" Occasionally, participants would also make unfounded statements of knowledge to strengthen their argument as well, such as referencing themselves as, "Someone who knows a lot about ... "

A call to authority does not result in influence without the necessary response to ensure it was effective. I questioned the two quietest participants in terms of their experience of the process. Both were female graduate students who did not speak during the large group discussions unless explicitly asked to. They expressed the same sentiment: they enjoyed the process but were hesitant to speak up because they felt they knew less than the other participants and, thus, had nothing to offer. Though it is logical to remain silent if you have nothing to add, the concern lies in the complete lack of spontaneous contribution. Reaching the foregone conclusion that they had nothing to offer could be interpreted as acceptance of the other's authority and, in turn, assuming their own lack of authority. Due to the complexity of social dynamics, the success of the individual tactics is difficult to infer but participant behavior suggested that an overall power hierarchy was being created. In fact, even during breaks, when "key" participants spoke, those people who many of the other participants deferred to, the room would fall silent.

As the following anecdote from the workshop demonstrates, the impact of authority and power dynamics was not used simply to lend additional weight to arguments or perspectives: As participants broke into groups to test out the extreme ends of the continuum in terms of the potential drivers they previously identified, a group formed of three females and one male. Two of the females were the ones that have been previously noted as being particularly assertive and acting as conversational gatekeepers. The third female and the male were graduate students. Before anyone else spoke, one of the assertive females instructed the female graduate student to be the recorder. The other quickly rattled off a laundry list of terms and then stated, *"These words are just popping into my head, so just..."* as she trailed off she raises her eyebrows and made an impatient gesture in the air of a hand that was writing. Without a word, the female graduate student

turned to the large sheet of paper on the wall and started transcribing her words, while the male graduate student turned and asks if he could present an idea.

The presence of status differential appeared to allow for participants to immediately assume roles. This, in turn, allowed those who have more power to act as gatekeeper to idea presentation; in this case, this occurred through two mechanisms: those in power explicitly assigning a task that would free up their own ability to participate while potentially hampering the other's ability and those with lesser power deferring to those with more power for permission to participate.

Power and Minority Influence

Majority influence is the influence exerted when a group agrees upon a subject. Minority influence is influence exerted by a dissenting individual (Nemeth, 1986; Van Dyne & Saavedra, 1996). In other words, if the influence of groupthink leads to conformity to the group, than the influence of a minority leads to majority adapting to a minorities perspective. When we're dealing with a diverse group, this might be a good thing. However, studies have found that minority influence is most effective if the individual trying to assert it is consistent, persistent typically through repetition, and flexible (Van Dyne & Saavedra, 1996), and *not* if she or he is right. This provides a unique challenge. Additionally the minority influence work does not address the added dimension of the role of social power. This is of particular relevance to the current study since those with more status had their points responded to and also referenced by other speakers

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To elaborate, the points that were made by those that were rated as having more power/status, were more likely to be addressed or reiterated by other participants. Again, critical to effective minority influence is persistence. If even just one individual is providing repetition for authority than they may, in effect, be strengthening their minority influence without any extra investment from the original speaker. Steve and John⁵, two participants who also played a key role in organizing and facilitating the event via providing background and contextual information, were often referenced throughout the process.

Some of the comments made in reference to them appeared to further lend to their expertise or influence, as well as general statements of support, such as:

"I knew I'd be intrigued by anything John and Steve asked me to do." "Steve's introduction may not have seemed earth shattering, but it turns out it was."

"I spent the last 25 years trying to convince federal agencies that photosynthesis was the answer to all of its problems – since John's been here, I've realized that actually that's not true."

Other statements were drawing on, more specifically comments they made:

"Going back to John's talk this morning..."

"This is an interesting point... going back to your point Steve..."

Part of this calling back to Steve and John may have been primed through Steve's introduction, during which he said, "*As we develop these scenarios we want you to think about John and I as clients… but we're also going to be participants and we're also*

⁵ Names of all participants have been changed.

proxies, really for all of the people around the room and around the state of Arizona who are going to be fashioning the energy future for the state... so, hopefully, that gives you some sense of how to approach the task in terms of who the audience is." This description of the two as client/participant/user combined with the two providing support in the facilitation process may have significantly raised their status and influence. They seemed to almost function as the hub from which the spokes (other participants) extended. In fact, participants would call on them to describe their own affiliation - "I am at the think tank with Steve" – though there were many other participants in the room whom they also shared this connection with.

Status and Holding the Attention of Others

The way in which people considered others answers was also heavily influenced by the degree of power given to the speaker. As the previous section reflects, those seen as having higher status were referred to more regularly and, with people regularly referencing their words at later times, the attention given to their words expanded past the duration of the time they spoke. When those with less status spoke, they were more likely to be interrupted or have the conversation redirected. There was one particularly telling occurrence of this: While the brainstorming session on drivers, one particularly quiet female graduate student was asked if she had any ideas of potential drivers. Though she had not previously spoken up, she suddenly straightened up and began concisely listing items that she felt might impact future energy usage and needs of the city: the planning and layout of the city as it grows, the culture of work environment and the amount of online or telecommuting involved, who makes energy decisions, the accessibility of energy technologies for all people. For a brief moment I felt a glimmer of excitement as I imagined the "accessibility of technology" play out – at one extreme you have a world with environmental technology locked away in a tower for the wealthy while the less fortunate struggle to gain entry. At the other end of the spectrum was a society where, somehow, new technology was instantly available to all. As she folded her hands in her lap and concluded, the gentleman next to her began, "This is an interesting point about who makes decisions – because, I think, going back to your point Steve..." The gentleman then entered into a story about the atomic bomb and how that was the first time scientists realized that they could make bad decisions. The woman appeared to slump in her seat when she heard the gentleman use her point only to reference someone else. I wrote my impression off to my own sensitivities. However, shortly after there was a break, during which I happened to be walking by when another graduate student asked her how she was enjoying the process. She smiled and said, "It was good ... but maybe it's over my head. My ideas on what's needed seemed much simpler than what others think of."

She engaged only to have the next person to speak disregard her point entirely, and instead returns the discussion to a comment made by one of the "key" participants. In a follow up interview the next day, she mentioned that she was not talking much because she did not think she was educated enough and that she did not have anything to contribute. From my perspective as an observer, her point was actually a very well articulated point that brought together several elements of the conversation holistically. It seems, however, that she internalized the group's lack of responsiveness as a flaw she held instead of an issue of group receptivity or, perhaps more accurately, simply poorly expressed receptivity since the construct of accessibility surfaced as an important dimension within the final scenarios.

The Gender Gap: Bifurcation Between Female Participants

Though there was some variation within male participants in terms of assertiveness and attempts to secure power, there was not a marked difference. However, with female participants there was a significant variation. One subpopulation of the women was extremely vocal and assertive to a degree that they might even be considered dominant or aggressive. Though they took varying approaches, one female made a point of continually critiquing others.

During the introduction, individuals were asked to provide their name, their role, and why they were interested in the scenario planning process. One of the leads was speaking about his interest in the way scenario planning allowed people to think through the process and further explained that disruptions to "*energy futures that we could envision are not technical problems; They're political-economy and social challenges. People have choices. Sometimes it doesn't feel like it, but they do.*" Later, she leaned forward and stated, "*The only corrective I want to make to what you said – and I don't know if you're aware of this – you talked about choices being market and consumer choices but choices are broader. We should be mindful of that.*" She told him that what he had said was "*an idea killer.*" It seemed to be harsh wording to use and unnecessary to critique something that not meant to set the stage but merely an opinion regarding his interest in scenario planning.

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This was not an isolated event. Throughout the process and into the second day, this pattern resurfaced. During the initial group discussion of the chosen scenario, one participant suggested, "*Perhaps pushing toward apocalyptic levels of extremes aren't helpful and, instead, we might want to consider more relative levels of extremes. We could look at relative high and low levels of the drivers as compared to today.*" The same assertive female states to the group that, "*Some people' are afraid to fully follow scenarios out.*" There is a momentary silence before the facilitator redirects conversation back to the lower left quadrant of the scenario.

The other subpopulation was extremely quiet and responded almost exclusively to direct requests. This second group did speak up somewhat more when the work transferred into a small group setting. There was one outlier within the women. One woman, a graduate student, seemed to escape this bifurcation. Unlike the other female graduate students she was much more vocal, however she did not fall in with the more assertive women either. She was the only subject who road the middle line. At first I attributed this to her membership in varying peer groups – she was of a similar age as many of the more senior individuals in the room but she also had less power being a graduate student. However, in reviewing video footage of the second day, I noticed that during the re-introductions, she introduced herself by name and stated the school she was affiliated with but, unlike other graduate students, she did not include a role. This, combined with being an untraditional student may have provided her with a unique advantage.

There are many potential causes to this variation. This could be simply the result of different personality types. It could be two different response-mechanisms to lack of
power. It could be the specific culture that was created did, in fact, create in and out groups that resulted in a "language barrier" that is the result of familiarity or lack of familiarity with jargon. Whatever the cause, it seemed somehow to be tied to a bifurcated response to power – either engagement or disengagement in the fight for power. However, there was one experience that leveled out the power imbalance between the female participants. When Donald, a respected individual in the world of scenario planning entered the room, the demeanor of the two more assertive females quickly became more subdued and receptive. This may have been aided by many factors: the facilitator's introduction of Donald as a "special guest" and a "celebrity," one of the leads quipping, "I thought he was too important to invite!" or Donald's own gentle manner which presented as both unthreatening and unthreatened. One sat back in her seat and folded her hands in her lap and, though she had previously been quick to interject, she did not interrupt once while he spoke. Without disruptions, he was able to weave a rich, detailed story. This ability to command a room enough to fully explain, uninterrupted, may be important to providing a clear explanation for an opinion. Being able to provide a complete "picture" may also be critical to genuine persuasion.

Speaking in Truths vs. Speaking in Opinions

A particularly interesting item that emerged through the discussion was the way in which people presented their thoughts. Those with authority were more likely to "speak the truth" while those without authority were more likely to "voice opinions." Often, those in positions of authorities would make "This is how the world is" statements. For example, when one of the more assertive females was stating her beliefs about Arizona, she stated it as, "There is a sense of exceptionalism in this state." Conversely those with less power were more apt to make statements that began with "I think that..." Low status participants were also found to state opinions in such a way that it sounded like a question. For example when the facilitator asked if any element was missing, one of the lower status participants replied with, "Interdependencies?" There were also less extreme statements made at both ends of the spectrum. For example occasionally high status participants did use the phrase "I think" but then tended to still follow it with a comparatively strong statement: "I'll put it out there as the way I'm thinking about it: Discontinuities are not good." A low status participant might also make a stronger, more confident statement but might tie it to something external: "The literature is pretty clear that they're linked." It is difficult to differentiate whether variation in talking preference is a result of authority, a side effect of authority, or an intentional play for authority; however, the result seems to be the same in that those who "speak in truths" create stronger arguments. This may create an intentional or unintentional path for framing scenarios. If the world "is" a particular way then certain scenarios become implausible creating a narrowing of potential explorations.

Conclusion

As previously noted, there has been minimal research in scenario planning on the role of social influence, as such this chapter seeks to contribute to this body of research. Participants were invited to this process and came of their own volition, and the data suggests they came in with an openness to participate. They also demonstrated engagement and were excited by new ideas and information. In light of this, there were

still, throughout this case study, various hallmarks of social influence surfacing that could lessen the effectiveness of the scenario planning process. There was the inescapable issue of hierarchical organizing. In this case, what was particularly interesting is that it did not necessarily play out as a grab for power but occurred by individuals placing themselves below others or feeling that they had nothing to offer in comparison to the others in the room. Similarly, by virtue of their role in organizing and providing context for the event, two participants were presumably unintentionally granted more power and attention, which likely translated to more influence. Dynamics played out in such a way that allowed some individuals to exert authority while others submitted to it. Across the board, these various social influence events or dynamics seemed, by and large, unintentional on the part of those involved. Regardless of intent, there is a need, not to set rigid processes in place, but to raise awareness of this fluid interaction. The process is reflexive and requires heightened sensitivity to how situations play out versus explicit rules that are applied uniformly. Furthermore, it is likely that, if made aware, those granted more power may have changed behavior or used their social influence to ensure that those without status or influence were granted more space to speak.

Additionally, some of the power-based sticking points within this particular case seem to hinge from very basic habits. For example, status and positions of power begin to be established during the process of introductions when people are asked to identify themselves based on their roles and how participants with more power were more likely to speak in truths. These two actions appeared to have strong impacts on interactions but they are both relatively manageable. Facilitators could either refrain from introductions or create a very structured introduction format such as one that directed people away from sharing information that pertained to status. In terms of truth-speaking, participants could be instructed in the types of statements they make, which is not an unheard of approach during facilitation. For example, they could be instructed to begin their statements with: "I believe that..." There were, however, phenomena that were more challenging to address such as the emerging academic group culture.

It is important to reiterate that, social influence is not something that you can "eliminate," nor is it something that you would want to eliminate. It is, however, something that can be monitored and potentially managed as the need arises. This monitoring of influence is particularly valuable to scenario planning since scenario planning uses employs various methods and uses diverse groups as a means of breaking up pre-existing group dynamics as a means to reduce influence. If we assume that it is being successful when it is not, it creates a problematic situation that may result in overconfidence and a false sense of security.

Limitations and Next Steps

Scenario planning processes have many variables interacting, many of which may be unique to the specific setting or organization conducting the process, so generalizing based on findings may be challenging. It is hard to establish whether findings within this event are unique characteristics of this group or if they are common occurrences across scenario planning events. With so many layers of interactions, it is difficult to even begin to infer causality. In terms of this body of scenario planning research, the next step is an experimental portion that seeks to establish further understanding of some of these phenomena within this unique context. Though there is general experimental data that speaks to authority and peer influence, the unique facilitated group, application-based, future-orientation of scenario planning may have unique outcomes.

Since scenario planning is, in fact, an applied process that is widely used, there are additional actions and considerations. For example, how are steps taken if this type of influence is often implicit? If the group cannot quickly identify the influence that is inhibiting their ability to think creatively and divergently then measures must be taken, to build awareness and improve their ability to correctly identifying these implicit forms of influence and then take appropriate action to counteract this influence so that both participants and the greater plan can gain as intended from the scenario planning process.

Scenario planning is described as a vehicle for strategic planning and decision making as well as a tool for group learning (Bodwell & Chermack, 2010; Scearce & Fulton, 2004). It seems that through the scenario process, learning did occur but that it was perhaps unevenly distributed. If we think about decision making and learning as separate goals than it would be acceptable to say that learning had occurred and that despite the shortcomings associated with power imbalance, the process was successful. However, I would argue that the goal of learning cannot be divorced from the goal of planning (since it is a foresight strategy). Perhaps the lower status individuals feel more prepared to make decisions for themselves through all that they've learned, but unless those in power are equally able to learn from those with less power, it is impossible for them to make better high level decisions in order to serve the greater good.

The role of power and social influence also becomes important to the nature of learning that occurs. Those with power mold the flow of conversation and the topics that are considered, or not considered, this in turn narrows the possible range of learning and decision making. This is not to say that someone with lesser power won't have an opportunity to impact a scenario planning event, but it does suggest that those with power become gatekeepers.

CHAPTER 4

PILOT STUDY: EFFECT OF STATUS AND BRAINSTORMING ON SMALL GROUP PARTICIPATION

This chapter takes a decidedly different approach to exploring the dynamics associated with scenario planning. Through using the lens and controlled, experimental method of social psychology, variables of interest can be isolated from the web of group interactions embedded in scenario planning, allowing for a clearer understanding of how the variables operate. Group work and deliberation provide important benefits to sustainability-oriented processes. As previously discussed, in addition to the normative values associated with diversity, incorporating varied perspectives contributes to stronger and more robust knowledge inputs into sustainability problem solving. For example, when addressing a complex problem, one can tap into a broader set of resources through accessing group members' "experiences, expertise, and manpower... in the pursuit of a common goal" (Kurtzberg & Amabile, 2000, p. 287). Additionally, decisions made through group deliberation have more buy-in and investment (from participants) than decisions made by leadership (Lunenburg, 2011).

However, due to a variety of social dynamics, group work is not devoid of challenges, which may undercut the stated benefits. Woolley, Chabris, Pentland, Hashmi, and Malone (2010) found that, though "group cohesion, motivation, and satisfaction" had no impact on the collective intelligence of groups, equal participation did. Groups with more balanced member participation demonstrated more collective intelligence than groups where a small subset monopolized interactions. Additionally, groups with too many high performers have been found to be more dysfunctional and less effective, particularly when they share the same areas of expertise; this may be the result of overinflated egos or vying for power (Groysberg, Polzer, & Elfenbein, 2011). In other words, though group work should enhance problem solving, a dysfunctional group may perform poorly in comparison to the cumulative product of individuals working independently on a project (Kurtzberg & Amabile, 2000).

Though dysfunction is problematic within groups, disagreement is not inherently bad, particularly when the source of disagreement comes from a minority perspective. This is referred to as "minority dissent," which occurs when "a minority in a group publicly opposes the beliefs, attitudes, ideas, procedures, or policies assumed by the majority" (De Dreu & West, 2001, p. 1191). When the inclusion of dissenting views is encouraged, the result is improvements in meeting process as well as decision making (Peterson, 1997). Additionally, De Dreu and West (2001) found that minority dissent within teams led to increased innovation. This is particularly true during early phases of group work (Farh, Lee, & Farh, 2010) and is not necessarily contingent on the quality of the dissenter's interjection. Indeed, dissenters "liberate people to say what they believe and stimulate divergent and creative thought *even when they are wrong*" (Nemeth, 2012, p. 362). Whether the objective is finding the correct answer or generating novel solutions, silencing of individuals who may hold different view points is not only a disservice to the individual but also to the group process as a whole.

In the case study presented in chapter three, several instances pointing to imbalance in participation were identified. Though scenario planning is perhaps better than other processes in reducing inequality, there was enough dysfunction that a subset of participants disengaged from active participation and only spoke when directly questioned. This is particularly critical in light of minority dissent, in part because a minority viewpoint was lost, but also because minority dissent has found to be effective only when paired with high amounts of group participation (De Dreu & West, 2001). Unfortunately, as a complex and future-oriented process, it is difficult to clearly trace the outcomes of imbalances and silencing of dissenting minorities in scenario planning. Despite the challenge of fully identifying how such imbalances swayed the process, incremental improvements can be studied by simplifying elements of scenario planning that operate in shorter time frames with comparable objectives. As such it becomes more important to identify and address mechanisms that may obstruct participation in group processes and tease out how they work and with which kinds of effects.

Participation

Ultimately, the challenges associated with group work and enhancing functionality of a group can be understood in terms of barriers to or facilitators of authentic participation. Authentic participation (see chapter two) occurs when individuals are granted decision making power and are also able to act genuinely and freely when participating in a decision making process. Participation is important but challenging to operationalize because individual characteristics and contextual factors impact what participation should look like. For example, Finn, Folger, and Cox (1991) identified distraction or interrupting others as non-participation, however this work is focused on academic performance, which ties their operationalization of participation to a specific normative frame that prioritizes academic abilities and motivations over other skillsets. From the framework of creativity, high energy and activity-level is, in fact, viewed as an indicator of creativity (Niu & Sternberg, 2002) and interruption, in some instances, has been shown to be productive. Pentland (2010) characterizes high activity and interjections or interruptions as engagement in a creative process, rather than disruptive behavior. Using this conceptualization to establish an understanding of participation would suggest that interrupting others or being distracted could actually be indicators of creative thought. Further, measures of participation that involve amount of time speaking and fidgeting may be better indicators of extroversion and adherence to social standards respectively.

To address the complexity of participation, this study attempts to tap into various elements of participation via incorporating four distinct indicators: self report, total amount of time spoken, ratio of successful interruptions to total interruption attempts, and finally, self turns taken by participants. The first variable, self report, or perception, is intended to understand how the participants felt about the overall group performance and their role in it. The next four variables are measures of interaction between participants, or "interaction signals," which denote interest and engagement on behalf of participants (Caneel, 2005). Total amount of time spoken is one of the more simplistic measures and establishes total amount of contribution to the conversation. A second measure of contribution to conversation was gathered via average speaking segment length. The two measures are intended to account for different speaking types as someone may speak for a large number of minutes total but have very short speaking segments, suggesting that their speaking time was perhaps spent facilitating or making confirmatory remarks (i.e. "uh-huh" and "okay"). The ratio of successful interruptions to total interruption attempts is used as a measure of engagement. Being able to interrupt others is important to

participation so that, not only is the individual's voice heard, but also so that they can participate spontaneously as thoughts are generated. Finally, self-turns involve measuring the number of times participants spoke, paused and then spoke again. This may indicate intellectual participation via thinking on the part of the individual and, perhaps more importantly, demonstrates receptiveness on the part of the group by way of a lack of "verbal pushing," an influence tactic where the influencer seeks to control the conversation by speaking quickly and allowing for no natural pauses (Pentland, 2010). Ultimately, each of these variables seeks to address a different element of participation, particularly in light of the presence of status.

Status

As previously mentioned, the delineation of status or ranking presented itself at the onset of the case study from chapter three. Status and power are distinct phenomena, with status referring to social rank or prestige and power referring to the ability to control resources, but they are tightly linked. Though not always the case, being granted status often comes with an increase in power (e.g., a higher position at work). Furthermore, when interacting with others "people are likely to use status as a (valid) indicator of power" (Lücken & Simon, 2005, p. 411). As a result, this discussion follows the lead of researchers who join power and status under one heading (often referred to as "status," "verticality," or "hierarchy") (Hall, Coats, & LeBeau, 2005; Mast & Hall, 2004).

"Status" or social prestige is believed to have evolutionary beginnings and can be seen among other primate species, and is generally conferred through body language and voice (Henrich & Gil-White, 2001; Mazur, 1985). Whether considering apes or a corporation, the functions of high and low status individuals remain fairly constant. Those with more status provide direction and control, whereas those with less status follow direction and attend to the needs of those with higher status (Fiske, 2010; Mazur, 1985). Hierarchy likely developed originally as a means by which to facilitate quick responses for the sake of survival when faced with dangerous situations (Mazur, 1985). It is also hypothesized that status plays a critical role in the cultural transmission of ideas, whereby maintaining close proximity to an individual, who is typically viewed as successful, and closely observing their behavior allows others to emulate and replicate their successful behavior (Henrich & Gil-White, 2001).

The Impact of Status on Social Cognition and Behavior

Status impacts how people feel and behave when interacting with others. Those with less status are more likely to experience negative emotion and attend upward, paying attention to those with more status as a means of protecting themselves from threats via behaviors such as self-censoring (Keltner, Gruenfeld, & Anderson, 2003). This is particularly true of low status female participants (Hall & Friedman, 1999) Conversely, those with more status generally express themselves more freely (Keltner et al., 2003), are more able to focus on the specific objectives they are working on (Guinote, 2007), and are more reward (rather than threat) focused (C. Anderson & Berdahl, 2002).

Having status impacts the way that people interact with others around them. For example, those with more status speak more in interactions (Hall & Friedman, 1999) and are perceived to be more dominant (Mast, 2002) – this is particularly true if the high status individual is male and speaking with strangers (Cashdan, 1998). Similarly, those with more status are also more successful at interrupting others than their low status

counterparts (Fiske, 2010; Hall et al., 2005) and the types of interruptions are often nonsupportive, such as changing the subject (as opposed to an interruption that asks a clarifying question; Menz & Al-Roubaie, 2008). It could be argued that these nonsupportive interruptions are used for course-correction and efficiency, but Menz and Al-Roubaie (2008) found that the use of non-supportive interruptions typically only resulted in prolonging the process. Interestingly, if the status differential is particularly large, the high status individual may become less assertive and begin speaking less (Hall & Friedman, 1999).

Low status participants from marginalized groups or communities may be particularly vulnerable when faced with high status individuals as a result of stereotype threat. "Stereotype threat" occurs when people perform poorly as a result of being reminded of a negative stereotype about the group they belong to (Cadinu, Maass, Rosabianca, & Kiesner, 2005; Steele & Aronson, 1995). It is possible that group interactions could occur in such a way that none of these reminders would be given. While this is true, merely being in an environment that is seen as threatening in terms of the stereotype (such as women solving a math problem in the presence of men) still results in underperformance (Inzlicht & Ben-Zeev, 2000). Furthermore, even outside of a threatening environment "stereotype threat spillover" may occur (Inzlicht, Tullett, & Gutsell, 2011). In the case of spillover, stereotype threat, and its consequences, and create anxiety even within nonthreatening environments. Indeed, simply being underrepresented in a group might be sufficient for creating negative responses. Sekaquaptewa and Thompson (2002) found that members of traditionally low status groups (women and African Americans) performed poorer when immersed in a group where they were the only participants from their social category as compared to their white male counterparts. *The Overextension of Status*

Hierarchy can, when employed correctly, increase satisfaction, motivation, and success (Halevy, Y. Chou, & D. Galinsky, 2011). Status, however, is a complex phenomenon and many factors impact perceptions of hierarchy that are not necessarily tied to one's ability to lead. For example, people attribute more status to people who score high in what they view as gender normative behavior (such as a man acting aggressive, or a woman acting nurturing) (Cashdan, 1998). Status is conferred unequally in terms of gender in other ways. For example, displays of expertise bring men more influence and status, whereas displays of expertise by women tend to result in lowered influence and status (Thomas-Hunt & Phillips, 2004). Additionally, perceptions of how participation occurs may be mediated by ideas of status. Women are perceived to be more talkative than men, though studies consistently find that men generally speak more in interactions (Kimble & Musgrove, 1988; Leaper & Ayres, 2007).

As a whole, these findings point to systemic discrepancies in participation and knowledge sharing. It is important then to consider why expertise and speaking is more valued from a member of a group that is considered to have high status. Moore (1968) referred to the tendency of high status individuals to have undue influence, even when point of status is not linked to the type of expertise needed, as the "status generalization phenomenon." According to this theory, people use easily accessible cues such as gender, race, and information about job roles to assess the status of others, regardless of the utility of any of those characteristics on the task at hand (M. Webster & Driskell, 1978).

It is important to consider status in the context of scenario planning as it can have a number of critical effects on participation, particularly since people can accurately assess the status level of people within a group as well as individuals through visual cues alone (Mast & Hall, 2004). For example, Shariff and Tracy (2009) hypothesized that "pride expressions" or displays were an evolutionary means by which to provide a visual cue to demonstrate being deserving of high status. Indeed, they found that when an individual displayed the three pride elements of (1) head tilted slightly back, (2) small smile and (3) hands placed on hips to expand posture, that participants did identify them as having higher status. Conferring status is not inherently bad, as it provides social information, but it can become problematic when we consider "hubristic" pride displays, or those that are intended to misleadingly inflate status (Tracy & Robins, 2007).

Though status may be fabricated, it still may impact the way participants interact within groups and perceive their experiences. Sachdev (1991) found that in a group task, those randomly assigned to "high status" (in this case they were identified as highly creative) were more likely to feel satisfied with their group membership and were also more likely to engage in discriminatory behavior against their low status group members despite their self-reported beliefs that they had engaged in more parity and less discrimination than the outgroup. Additionally, they reported that those who were given low status acknowledged their lower status and were less satisfied with their group membership and were more critical of the process. However, dissatisfaction may not be detected by the rest of the group since those with less status tend to show more positive or polite cues such as smiling more (Hall et al., 2005). Important in the context of the scenario planning workshop, groups with shorter tenure together are more likely to rely

on these "diffuse" status cues, or broad status cues that seemingly point to general ability identified in the status generalization phenomenon, rather than specific cues that indicate targeted knowledge (Bunderson, 2003).

Brainstorming

Brainstorming, in this chapter, is considered as a possible tool to address challenges associated with just participation. "Brainstorming" was developed by Osborn (1963) and is a tool for idea generation in service of problem solving. It is a method originally created for group usage, which had people go through the process of generating a variety of potential answers to a question while temporarily suspending judgment of the answers provided. The effectiveness of this process is attributed to the stimulation of novel ideas as a result of earlier, less novel, ideas (Connolly, Routhieaux, & Schneider, 1993). These novel ideas form as a result of social factors, which include building off of the energy of others, and cognitive factors such as priming (V. Brown, Tumeo, Larey, & Paulus, 1998). Additional benefits to brainstorming processes include more satisfaction with group work and group processes (Kramer, Kuo, & Dailey, 1997).

Since its inception, brainstorming has become widely adopted and is often identified as important for creativity and problem solving. However, there is also a great deal of criticism on its effectiveness (Mullen, Johnson, & Salas, 1991; Paulus et al., 1995). These challenges may arise based on the nature of the individuals in the process, the group dynamics, or as a result of the process design alone. This process has since also been expanded beyond a group setting to include individual level idea generation, which is the focus of this chapter. Paulus et al. (1995) found that when comparing groups of

four, half of which brainstormed together and half of which brainstormed independently side-by-side (often referred to as "nominal groups" or groups in name only), despite the participants' beliefs that they brainstormed best in groups, those who brainstormed collaboratively produced half as many ideas as those who brainstormed in nominal groups. Specifically, individual idea generation, or brainstorming, in advance of group decision making is believed to promote equality via limiting the effects of social influence within groups (Delbecg, Van de Ven, & Gustafson, 1975). V. Brown et al. (1998) used modeling to compare individual and group brainstorming. Their findings suggest that the shortcomings of group brainstorming are primarily a result of social dynamics, which tend to have largely negative impacts on the process. Their results echo the findings of Mullen et al. (1991), who found that group brainstorming was less effective than individual level brainstorming as a result of productivity loss. Interestingly, V. Brown et al. (1998) found that, if social factors were removed from brainstorming entirely in his models, then cognitive benefits make group brainstorming more effective than individual level brainstorming. Considering the inability to remove social dynamics from group processes, this study ultimately lends support to the use of individual level brainstorming. One area of concern within brainstorming is that initial brainstorming may create a narrowing of focus, or a "lock-in," to initial ideas (Heath & Heath, 2013). This has proven to be problematic in group brainstorming where all members of the group become fixated around an idea, but with nominal groups more ideas are still generated (Kohn & Smith, 2011). Thus, in the case of individual level brainstorming, that lock-in may be the mechanism by which participation is bolstered during the subsequent group process.

Further support is provided for the benefit of individual-level brainstorming as a solution to unequal status. Status differentials have been shown to have a negative impact on participation and creativity in groups (Collaros & Anderson, 1969). Davis, Zaner, Farnham, Marcjan, and McCarthy (2003) employed the use of a computerized group decision support system to examine how it impacted uptake of individual-level brainstorming. Sessions that used the tool came up with a broader diversity of ideas as compared to in-person sessions. Furthermore, when anonymity was maintained, ideas produced by male participants were less likely to be given priority by the group. Similarly, Stam, De Vet, Barkema, and De Dreu (2013) found that individual level brainstorming ultimately allowed for more diverse perspectives to be incorporated in ensuing group discussions. These two studies provide support for the hypothesis that brainstorming might not only improve participation in general, but more specifically bolster participation in light of unequal status. Additionally, since some of the productivity loss in group brainstorming is attributable to anxious participants performing at a lower level due to stress and other participants reducing their performance to match them, anxiety can be reduced and productivity enhanced through the use of individual level brainstorming (Camacho & Paulus, 1995). Though the mechanisms underpinning the effectiveness of individual brainstorming are unclear, what is apparent is that - in the face of productivity loss faced by the group – nominal group brainstorming is more effective (Mullen et al., 1991; Ziegler, Diehl, & Zijlsrta, 2000).

Present Study

The present study used a 2x2 design to explore the impact of revealing or concealing status and pre-event individual-level brainstorming on participation within group deliberation processes. Same sex triads consisting of two undergraduate students and one graduate student were engaged in a group ranking task which asked them to rank items from most to least important for surviving a plane crash. Prior to beginning the task, participants were asked to either reveal or conceal their degree sought (undergraduate or graduate) and either instructed to brainstorm their individual ranking or rank individually without brainstorming. It is hypothesized that, in conditions with revealed status, low status participants will participate less and be less satisfied than their high status counterparts. A second hypothesis is that pre-event, individual level brainstorming will lead to more individual satisfaction and more participation. The third and final hypothesis is that the effect of explicit status difference will be reduced by individual brainstorming, relative to when individual brainstorming does not take place.

Method

Participants

Seventy-two students participated in this study (39 female, 33 male). Of these participants, there were 48 undergraduate and 24 graduate students from Arizona State University. Participants were between the age of 19 and 30 with the mean age of 22.9 (SD = 3.13). Of the participants, one identified as Black or African American, 7 as Asian, 8 as Hispanic, 50 as White, and 6 as Other. In terms of nativity, 83.3% (60) were born in the United States while 16.7% (12) were not. Similarly, the majority had both

parents U.S. born (45), with 11 participants having only one parent born in the U.S., and 16 with both parents born outside of the U.S. In terms of education, the sample came from a fairly educated background with 56 participants reporting that they were not first generation college students and only 16 students identifying as first generation college students. In terms of parental education, 45 participants reported their mother as having a bachelors degree or higher. This number (45) held true for their fathers as well. Participants were also relatively homogenous in terms of reported socioeconomic class with 81.9% reporting being in the "middle" (35) or "upper-middle" (24) income bracket. Just two reported being in the "upper" bracket, ten "lower-middle", and one "lower." Participants were recruited through the use of flyers placed around campus. Volunteers were offered a participation incentive of eight dollars. Additionally, three undergraduate sustainability classes were given the opportunity to participate for extra credit in lieu of the monetary incentive.

Procedure

Participants were scheduled to come to the lab in same-sex triads, each consisting of two undergraduate students and one graduate student. Participant availability was used to randomly create groups. Twenty-four total groups were formed. Upon arrival, participants were invited to read and sign an informed consent form and were each provided with a wearable sociometric badge. Participants were then seated around a small round table.

In all sessions, participants were asked to complete a "Desert Survival" scenario task (Cooke & Lafferty, 2006), commonly used to measure group decision-making

dynamics. Participants were allowed up to ten minutes for the individual ranking. They were then instructed to take turns introducing themselves to the other group members before engaging in the group ranking task. They were asked to complete the group ranking process in twenty minutes (though groups who ran over were allowed to complete the task).

Although all groups were asked to complete the task, groups were randomly assigned to four conditions The first variable manipulated was whether or not participants were instructed to brainstorm the rationale for their priorities individually prior to the group ranking process. The second variable was whether or not participants were instructed to reveal their degree sought (i.e., undergraduate or graduate students) when introducing themselves to the group. In the concealed status condition (abbreviated in figures and tables as "no status"), participants were instructed to introduce themselves by name and describe their interests, concealing their degree sought; in the revealed status condition (abbreviated in the figures and tables as "status") they explicitly asked to include more descriptive information, including their degree sought (i.e. whether they were a graduate or undergraduate student).

After the group discussion and ranking of items, which lasted a maximum of 30 minutes, participants completed a brief questionnaire, which included demographics and four items around their experience participating in the discussion. Participants were debriefed verbally, and allowed to ask questions and review the "correct" ranking and rationale for the ranking.

Measures

Sociometric badges. Sociometric badges are electronic devices, smaller and lighter than smart phones, which are worn around the neck. The badges gather data on group interactions through triangulation of speech prosody, accelerometers, Bluetooth, and infrared data that is collected by the devices and compiled through the analytical software associated with the badge. Though a large range of data is produced by the badges and software, this study focused on three measuring related to participation: speaking time, which is the total amount of time a participant spoke for during the group process (average speaking segment length x total number of speaking segments); average speaking segment, which is the average of each participants speaking turns; ratio of successful interruptions (number of successful interruptions/(successful interruptions + unsuccessful interruptions)); and self turn taking, which occurs when individuals are speaking, pause for more than half of a second but less than ten seconds, and then begin speaking again.

Desert Survival Situation. From Desert Survival Situation by R.A. Cooke and J.C. Lafferty, 2006, Plymouth, MI: Human Synergistics. Copyright 1989- 2014 by Human Synergistics, Inc. Used by permission. This was originally designed as a group decision-making and team development tool. It begins with instructions asking participants to imagine that they are the only survivors from a plane that has crashed in the Sonoran desert, that they decided to stick together as a group, and that they must decide first individually and then as a group how to prioritize a list of 15 items salvaged from the wreckage as potential aids to survival. Participants rank the items first individually and then as a group. Many items on the list for consideration are vague in

terms of utility. There are, however, correct answers that were established by the United States Marine Corps, an organization with significant experience and expertise on survival in harsh conditions.

Survey. The survey had sixteen items on it divided into two sections. The first section of the survey contained four questions about participants experience within the groups. Participants were asked to rate the degree to which they agreed with the statements (e.g. "I felt comfortable sharing my opinion with the group") using a 7-point Likert scale with one reflecting "strongly disagree" and seven reflecting "strongly agree." The second section of the survey contained demographic questions related to age, gender, nativity, and socio-economic status, as well as a question regarding their potential survival expertise.

Analytical Plan

One of the key assumptions in statistical analyses is that observations must be independent of each other. The nature of this study had participants acting within groups, as such Multi level Modeling (MLM) was used due to the possibility that there was not independence of observations thus violating this assumption. MLM is a statistical process, a series of related statistical tests, intended to address or identify interconnectedness within subgroups within larger group. Within MLM these subgroups are referred to as "nested variables." In the case of this study, the triads are the subgroup within the larger experiment. In MLM, the subgroups within the study are referred to as the "level-two" variables or "clusters." The individuals within the study are referred to as the "level-one" variables. Through running MLM analyses, brainstorming and status can be evaluated at the group level (as opposed to other statistical methods that evaluate at the individual level only).

All variables were continuous variables, with the exception of the count variable of "self-turns." However, self-turns had a relatively normal distribution and was without an abundance of zero scores (see Table 3), as such treating it as a continuous variable was justifiable.

There were four models (0-3) used for each dependent variable. First, an unconditional model, Model 0, was estimated. An unconditional model has no predictors, meaning there is no hypothesis being tested. Generally, the purpose of the unconditional model is to examine how individuals and groups vary and identify if there is a dependency within groups. In other words, it addresses the question of whether or not interdependence actually exists between the data points (participants) in each group and suggests whether or not the process of analysis should be continued. As this is a pilot study, in this case this unconditional model instead provided baseline data. Model 1 was then run. This model introduces level of degree sought (undergraduate or graduate) as a predictor. It describes how, if at all, degree sought impacts each dependent variable. Again, regardless of statistical significance, all variables proceeded onto Model 2. This model adds in the study manipulations (brainstorming and status) with an objective of describing the variation between conditions. Finally, in Model 3, the slope is allowed to vary by experimental condition. The slope is allowed to vary across clusters (rather than the single slope estimated in Model 2), providing slopes for each of the experimental conditions. As this was a pilot study with a small sample size, the focus of this analysis was not on statistical significance but on describing variation and directionality. As such,

the focus of the results section are on Model 3 as it provides the richest information in terms of understanding the effects of the manipulations on the five dependent variables.

Grand mean centering was used for all five level-one variables (total speaking time, average speaking segment, perception of participation, self-turn taking, and successful interruption rate) to establish whether or not there was a dependency between groups. The variance estimates were then used to compute intraclass correlations (ICC). These ICC values provide information about the relationship on group performance on dependent variables, or the degree to which group members' scores are or are not independent of each other (Reis & Judd, 2000).

Results⁶

Descriptive analysis was conducted on the outcome variables (Table 6 and 7). The four self-reported items, which were intended to measure individual participants perception of the participative process, were all similar in terms of means and standard deviation, suggesting that they could be collapsed into a single score. To support this, I conducted a Cronbach's alpha for the four items, which was found to be highly reliable ($\alpha = .902$). With such high reliability between items, collapsing the items into a single measure was justified.

Total Speaking Time

Total speaking time had an ICC of 0.518 meaning that 51.8% of the variability within total speaking time is accounted for by group membership. This is the largest ICC of all dependent variables and is not entirely unexpected as the group duration was

⁶ The statistical analyses conducted in this chapter were completed in collaboration with David Lovis-McMahon and Camille Basilio

dictated by the amount of time to complete the task. If a group met for a longer duration,

there is a larger opportunity for all participants to speak more. The reverse is also true.



Figure 3. Total Speaking Time in Seconds on Student's Degree Sought by Experimental Condition

Table 1. Group wear and Stope by Condition for Total Speaking Time			
	Mean	Slope	
Brainstorming, No Status	443.682	56.741	
Brainstorming, Status	448.355	41.468	
No Brainstorming, No Status	452.39	-51.108	
No Brainstorming, Status	409.347	2.332	

Table 1. Group Mean and Slope by Condition for Total Speaking Time

Beginning with the condition in which status is revealed and brainstorming is absent or, in other words, the "normal" condition,⁷ there is relatively little variability between graduate and undergraduate participants (slope = 2.332). When brainstorming is introduced alongside revealed status, graduate student total speaking time is bolstered with a slope of 41.468 (an increase of 39.136). When brainstorming is maintained but status is concealed, the divide grows even larger with a slope of 56.741 (an increase of 54.409 from the normal condition). In contrast, when status is concealed and brainstorming is once again absent, the balance shifts with undergraduates speaking more in total than graduate students (slope = -51.108).

Ultimately, in the case of total speaking, it appears that refraining from brainstorming is more useful in terms of moderating the effect of status, with revealed status having more parity but concealed status leading to more bolstering of the lower status, undergraduate participants.

Average Speaking Segment

Average speaking segment had an ICC of 0.023. This suggests that only 2.13% of the variability in speaking segment length is attributable to group membership. This low figure may lend support to the assumption that the high ICC of total speaking time was attributable simply to artifacts related to group process.

⁷ In this instance "normal" refers to the condition that is most likely to occur within typical societal interactions.



Figure 4. Average Speaking Segment on Student's Degree Sought by Experimental Condition

Table 2. Group Mean and Slope by Condition for Average Speaking Segment			
	Mean	Slope	
Brainstorming, No Status	2.622	1.816	
Brainstorming, Status	2.712	1.154	
No Brainstorming, No Status	2.847	-0.332	
No Brainstorming, Status	2.760	0.924	

In the case of average speaking segment, when status is revealed and brainstorming is absent, graduate student participants speak for longer periods of time on average in comparison to their undergraduate counterparts (slope = 0.924). In the condition where status is once again revealed but brainstorming is added, the undergraduate students once again speak for shorter durations than the graduate students

with the difference becoming more pronounced (slope = 1.154). Following a similar pattern to the total speaking time variable, the gap grows even larger when brainstorming is maintained but status concealed with an increase from the normal condition of 0.924 (slope = 1.816). In the final condition, with status concealed and an absence of brainstorming, there is a directional shift. In this case, undergraduate student participation is bolstered over graduate student participation (slope = -0.332).

Again, refraining from brainstorming appears to have the most benefit in reducing the effect of status. In this case, concealing status results in more bolstering of undergraduate participants and more equity in participation between the two groups.

Self-Rated Group Participation

Self-rated group participation had an ICC score of 0.043, which means that 4.3% of variability is accounted for by group characteristics. In general perceptions around participation were quite high with a mean of 6.282. In looking at the data we see that satisfaction was highest in the no brainstorming conditions and, in this case, the concealed status condition both most favors undergraduate participants and also is the condition with the highest satisfaction. The revealed status condition somewhat less favors the undergraduate participants and is instead the condition with the most equity between groups.



Figure 5. Self-Rated Group Participation on Student's Degree Sought by Experimental Condition

Table 3. Group Mean and Slope by Condition for Self-Rated Group Participation		
	Mean	Slope
Brainstorming, No Status	6.013	0.477
Brainstorming, Status	6.22	0.167
No Brainstorming, No Status	6.483	-0.165
No Brainstorming, Status	6.404	-0.044

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In the case of self-rated group participation, the revealed status condition without brainstorming, unlike the previous variables, demonstrates a negative slope of -0.044, with undergraduate participants reporting higher evaluations of their group performance. When brainstorming is introduced alongside revealed status, the slope shifts direction with graduate student participants now reporting higher evaluations (slope = 0.167).

When status is concealed but the presence of brainstorming is maintained, once again the slope becomes more pronounced (slope = 0.447). In the final condition, where status is once again concealed and brainstorming is removed, graduate students report lower evaluations than their undergraduate counterparts (slope = -0.165). This condition (concealed status with no brainstorming) once again displays the most bolstering of undergraduate participants as well as the most parity between the two groups. Though Delbecq et al. (1975) posits that brainstorming will lead to more equity in participation, this is not reflected in the perceived experience of the participants.

There are two considerations that are important to the weight and interpretation of this variable of self-rated group participation. First there is one outlier in the concealed status condition who scored their experience as very low, I contend that this is not a result of error but a genuine result of dissatisfaction. As this is a pilot study, there are a low number of participants so what appears to be an outlier is potentially not. Furthermore, as demonstrated in figure 4 there is generally more variability in terms of satisfaction among undergraduate participants, particularly in the brainstorming condition, further suggesting that this score is appropriate to keep within the data set. Second, despite the rationale for keeping this data point in, it is worth noting that the scores are, across all conditions, bunched at the high end of the scale (which had a maximum score option of 7). Though ceiling effects generally mask variability within treatments, in this case with such few participants the low variability caused by the ceiling effect (SD = 0.853) combined with the three outliers may be creating the appearance of an effect when, in fact, there likely was not one. Notwithstanding these two caveats, it is worth noting that the self-rating

variable does demonstrate a similar pattern of relationships between conditions as the two previous dependent variables.

Self-Turn Taking

The ICC for self-turn taking was 0.213 (21.3% of variability in self-turn taking can be attributed to group characteristics). This was among the highest scores of the dependent variables tested in this study.



Figure 6. Number of Self-Turns on Student's Degree Sought by Experimental Condition

- word in order provide word word of the second		
	Mean	Slope
Brainstorming, No Status	106.009	-56.145
Brainstorming, Status	99.715	-29.696
No Brainstorming, No Status	113.715	6.252
No Brainstorming, Status	95.275	-35.934

Table 4. Group Mean and Slope by Condition for Self-Turn Taking

In the case of self-turn taking metric, in the revealed status condition without brainstorming there is a negative slope (slope = -35.934) meaning that undergraduate students took more pauses while speaking than the graduate students. When brainstorming is introduced to the revealed status condition, undergraduate students remain bolstered but to lesser extent (slope = -29.696). When brainstorming is maintained but status is concealed, self-turn taking in favor of the undergraduate participants is most pronounced (slope = -56.145). In the final condition, no brainstorming with concealed status, the directionality shifts in favor of the graduate students (slope = 6.252). It is worth noting, however, that in spite of favoring graduate students, this is also the condition with the most parity.

In considering the various conditions, at initial take it appears that refraining from brainstorming is of greater benefit to undergraduate participants (with a difference of 6.238), but in looking at the variation in scores (see figure 4), graduate students show much less variation in this condition than in other conditions. This suggests that the presence of status without brainstorming may potentially result in the higher status participants engaging in verbal pushing.

Ratio of Successful Interruptions

Ratio of successful interruptions has an ICC of 0.321 which means that 32.1% of the variability on this measure is attributable to group characteristics. As with self turn taking, this is among the higher ICC scores for the various dependent variables studied. The grand mean for the ratio of successful interruptions was 0.476 or, in other words when attempting to interrupt participants were successful 47.6% of the time.

Figure 7. Ratio of Successful Interruptions on Student's Degree Sought by Experimental Condition



 Table 5. Group Mean and Slope by Condition for Ratio of Successful Interruptions

 Mean
 Slope

	Mean	Slope
Brainstorming, No Status	0.499	0.061
Brainstorming, Status	0.488	0.039
No Brainstorming, No Status	0.444	-0.003
No Brainstorming, Status	0.473	0.056

In the normal condition, status revealed and brainstorming absent, graduate participants demonstrate a higher interruption success rate (slope = 0.056). When brainstorming is introduced with revealed status, graduate students remain more successful at interrupting than their undergraduate student counterparts, though the advantage lessens (slope = 0.039). With brainstorming still present but status concealed, the imbalance grows more pronounced (slope = 0.061). When brainstorming is removed and status is concealed, there is the most parity of all conditions (slope = -0.03). Furthermore, as the negative slope demonstrates, undergraduate participants are slightly favored in this condition.

Ultimately, in the case of successful interruptions, it appears that refraining from brainstorming is useful in situations in which status can be concealed. In cases where status must be revealed, however, brainstorming does hold some potential for decreasing the impacts of status.

Discussion

As previously outlined, there were three hypotheses being tested with the study to examine the impact of status and brainstorming on participation. These hypotheses and their findings are explored below.

H1: Explicit status differentials will lead to less satisfaction and less balance in participation.

The impact of concealing or revealing status varied across the different metrics of participation. Interestingly, there was more parity between graduate and undergraduate

participants when status was revealed (in the no brainstorming condition) and this was also true in terms of self-ratings on group participation. However, if the objective is to bolster the participation of the lower power group then concealing status is more impactful as it demonstrated a negative slope demonstrating that undergraduates were speaking more than graduate students. Self turn-taking and ratio of successful interruptions most closely reflected the premises of the hypothesis with the concealed status leading to more equality between graduate and undergraduate students.

H2: Pre-event, individual level brainstorming will lead to more balance in group participation

Brainstorming also had mixed outcomes in terms of potential for increasing parity in group participation. It seems that though brainstorming is believed to lead to lock-in (Heath & Heath, 2013) that this may have been experienced in a detrimental way. Specifically, pre-event brainstorming led to less satisfaction among undergraduate participants. This drop in satisfaction is perhaps due to their ability to more readily and clearly compare their individual observations with the decisions made by the group. This was more pronounced when status was concealed. This may be the result of experiencing power imbalances while having ambiguity in terms of whether or not that imbalance actually existed. Similarly, brainstorming was most detrimental to undergraduate selfturn taking and ratio of successful interruptions when status was concealed.

H3: Pre-event, individual level brainstorming will increase participation and satisfaction in groups where status difference is explicit.
On the first three dependent variables (total speaking time, average speaking segment, and self rating of group participation), brainstorming did not bolster participation when status was present as compared to when it was absent. However, on the final two dependent variables (ratio of successful interruptions and self-turn taking) there was an increase in parity when brainstorming was introduced as compared to when it was not. Though lower status participants spoke less during the process, the findings suggest that their ability to take the floor (via interruption) was increased as was their ability to think through an idea that they were presenting. If status was playing out in this dynamic, it did so via self-censoring which aligns with the tendencies of participants in the scenario planning workshop.

Limitations and Future Directions

As this was a pilot study, one critical limitation within this experiment was the number of groups in the study. Within multilevel modeling, it is commonly accepted that in order for the test to have sufficient power, there should be at least 30 groups. This pilot, which included just 24 groups, was underpowered.

Another potential limitation within the study was the strength of the status manipulation. First, several of the graduate students referred to themselves as "first year students." It is possible that because they were generally new to the role of graduate student, that though they technically had higher status than the undergraduates, they did not feel as though they had status. Additionally, many of the undergraduates referred to themselves as "juniors" and "seniors" which suggests that while they may have lower status in terms of degree structure, that they may have more knowledge of the university and enjoy relatively higher and more secure status within their reference group at the university where the study took place. A second cause for the lack of variation regarding high and low status groups is, assuming that there was sufficient status difference between graduate and undergraduate students, participants in groups where status was not revealed may have provided other clues in terms of status. This may have happened by way of vocabulary, attire or other variables often associated with status (M. Webster & Driskell, 1978). Clothing choice alone has been shown to impact perceptions of success and importance (McDermott & Pettijohn, 2011). Finally, status can also be acquired through personality characteristics, such as extroversion, and physical attractiveness (C. Anderson, John, Keltner, & Kring, 2001). As such, it is possible that the status manipulation was not powerful enough which allowed other existing dimensions of status to play out.

As noted, many of the graduate students were early in their graduate career and undergraduates were primarily later in their undergraduate career, thus participants may have been close in age. Though age was controlled for in order to ensure that a large age gap did not operate as a confound in terms of the status manipulation, the lack of variation in age may also have been problematic (SD = 3.13); this is particularly true in the case of the status manipulation not being significant enough. Too small of an age gap between low and high status participants, or a particularly young appearance of a high status participant may have undercut the status manipulation.

Most undergraduate participants were recruited from classes for Sustainability majors and many recognized other students who participated in their group from courses that they currently or previously had together. As such there is a potential that the strength of the ingroup that was created was sufficient to usurp any status gained by the manipulation. Ultimately, future iterations of this study should seek to use more significant status manipulations and ensure that low status participants are not acquainted.

Since the various measures of participation were not uniform in terms of their performance during the various manipulations, it may be worthwhile to examine which measures of participation are most important to the deliberation process. It may be possible that the ability to take self-turns and be successful in interrupting others is more important to the deliberative process than is time spent speaking, for example. It may also vary based upon the goals of the process. For example, a process geared toward extracting information may be particularly mindful to length of time speaking whereas an on-boarding process may be concerned with the satisfaction of the group members.

Finally, this study focused on one element within the scenario planning process, which is the ranking of potentially critical variables (though in the case of scenario planning this is system drivers rather than actual objects). Though this is an important first step, further studies should be conducted to examine other sub-processes that exist within scenario planning. For example, pre-event individual-level brainstorming may be more effective at enhancing participation for idea generation elements of scenario planning. Furthermore, as gender and group culture emerged as thematic findings in the case study, partial replications of this study should be conducted to understand how brainstorming might interact with those variables in terms of participation.

	Mean	SD
I feel good about	5.89	1.069
I felt comfortable	6.44	.948
I felt my opinion was considered	6.39	.865
I felt my group worked well together	6.40	.988
Composite	6.281	.853

Table 6. Means and Standard Deviations of Self-Rated Group Participation

Table 7. Means, Standard Deviations, Minimum, Maximum Values for Sociometric Measures of Participation

Measures of Farticipation				
	Mean	SD	Min.	Max.
Self Turns	103.778	80.568	16	438
Successful Interruptions	.476	.093	.27	.69
Total Speaking (in seconds)	438.5	153.929	179.5	789.5
Average Speaking Segment (in	2.737	1.085	1.065	5.160
seconds)				

CHAPTER 5 CONCLUSION

Introduction

Sustainability is an action-oriented field (Clark, 2007) that regularly engages future focused methods to prepare policy-makers, planners and, ultimately, society for an uncertain future. Sustainability and scenario planning, the foundations of this research, are both action oriented, so it is important to understand factors that lead up to and, potentially, unduly shift the focus of these actions. Evaluating processes in terms of whether they are just and give equal weight to diverse participants' perspectives, needs, and values is important to ensuring actions are well informed. The aim of this research is to examine scenario planning, a commonly used future-oriented method, within the often fuzzy boundaries associated with sustainability, and explore the role that power and social dynamics play in the process, while using an ethical, holistic understanding of participation as a platform. Though there are significant bodies of work on status and social influence, and on scenario planning, there is a need for enhancing knowledge at the crux of these literatures. As such, this research makes headway toward this objective, by addressing the following questions:

What impact do social dynamics have on scenario planning, particularly in the context of sustainability?

Are there steps that can be taken to make the process more just? If so, what are they?

The focus of this concluding chapter is to synthesize the finding of the dissertation chapters, place them into the context of these two overarching questions,

discuss the implications of this body of work, and, finally, explore limitations and avenues for future research on this topic.

Empirical Findings

This research is designed with the overarching, long-term objective of obtaining more fairness in participative processes, which in turn funnels more justice into sustainability solutions. To accomplish this task, the research takes an interdisciplinary approach, relying on a combination of ethical exploration, observational data, and an experimental pilot study to build a richer understanding of participation within the scenario planning process in the context of sustainability. Though the findings of the three previous chapters are discussed in detail within each respective chapter, the main themes are briefly summarized below and then synthesized in light of the two overarching questions.

Chapter Summaries

Chapter one, the Introduction, uses a literature-driven approach to address the question, "Why is understanding social influence in the context of scenario planning important to the field of sustainability?" This chapter situates scenario planning in terms of its utility as a post normal science tool for addressing sustainability problems.

Chapter two, Ethics and Participation, engages an ethical analysis focus to address the question, "What does ethical participation look like?" Exploring the impact of oppression and systemic injustice provides a deeper understanding of the power dynamics and forces at work that might lead to unjust social influence. Ultimately, the chapter provides a framework for understanding types of participation, and nonparticipation, and what basic elements are necessary to move toward authentic participation.

Chapter three, the Energy Workshop uses an ethnographic analysis to address, "What sources of influence, if any, are at play within the scenario planning process?" Through this exploration of social influence and power dynamics within the scenario planning process, I found that despite efforts within the scenario process to limit social influence, power dynamics did surface and appeared to strongly influence the degree of participation of participants, most notably those at the highest and lowest ends of the power spectrum.

Chapter four, the Pilot Study, furthers the understanding of some of the dynamics at play within the scenario planning process and tests two variables: status and individual level brainstorming. The chapter seeks to address two questions: (1) "Does explicitly stating status differentials lead to more unequal participation?" and (2) "Does the use of pre-event brainstorming counter imbalances in participation?" The research demonstrated mixed effects in terms of both concealing status and the use of brainstorming on participation with the most consistent benefit coming from concealing status and refraining from individual level brainstorming.

Addressing the Overarching Research Questions

The findings of the latter three chapters are synthesized below and are structured as responses to the overarching questions.

Q1: What impacts do social dynamics have on scenario planning?

There are two key levels of impact that are apparent. The first is the impact on the individual participant and the second was the impact on the group. In terms of individual impact, as Ethics and Participation suggested, the Energy Workshop found that those who enjoy an elevated level of status seem more comfortable offering their opinion while those with less status demonstrate less ease in offering it and only want to do so if it provided value (whereas, high status participants are comparatively unconcerned with their value-add or, alternatively, are more inclined to assume that they are adding value). This seems to mirror Young's insights into how those who are oppressed by society learn to act in accordance with the status they've been granted or otherwise embody the oppression (Young, 1990). The degree of self consciousness or self-awareness that may be associated with the desire to only express useful opinions among low power participants may result in more rumination and reflection on ideas, resulting in distraction and potentially lessen their degree of learning from the scenario planning event. Additionally, this hesitation to contribute may lead to a lack of engagement that, in turn, may result in a lowered sense of ownership. If individuals are not participating because they deem others better able to address the issue, they may feel lack investment in the outcome of the process. The experience of a sense of inadequacy in terms of ability to contribute to the discussion, may also translate into participants gaining a sense of inadequacy in terms of perceived competence in addressing the issue in their own life.

The group-level impact is tied to processes and outcome of scenario planning. The apparent systemic variation in levels of process engagement translates into an imbalance in the type and degree of diversity of perspectives incorporated into the discussions. This narrower breadth of diversity may have two key impacts: narrowing of the scope of focus of the scenario planning event to the world view of the dominant group and limiting creativity by lessening opportunities for the incorporation of divergent viewpoints.

Q2: Are there steps that can be taken to enhance the process?

There were three ways in which this question is addressed through the research. First, the Pilot Study addressed this most explicitly by testing two solutions: (a) whether obscuring status would create more balance in participation and (b) in cases where status must be conferred or is apparent, whether brainstorming can act as a tool to enhance participation imbalance. The pilot study did suggest that individual brainstorming had some potential to be a valuable tool, but there were some trade offs in terms of the facets of participation that benefitted from the manipulations and, in particular, participants may ultimately wind up less satisfied. Concealing status, on the other hand, was more uniform - though at times less pronounced - in the benefits it offered those with lower power in terms of the various metrics of participation.

Second, in the Energy Workshop, it was noted that reticent participants did, to some degree, speak up more during small group work. Though authority or status was still flexed (maybe in even more direct ways) during these breakout sessions, individuals seemed more open to spontaneous participation. Furthermore, when there was small group share out, there was often minimal assigning of ideas, so if a high status individual were to share a thought presented by a low status small group member, the high status individual would be conferring their own status onto the idea. Thus, having more small group work within scenario planning events may be another way to fortify the participation of those with less power.

Finally, solutions begin to form as a result of Ethics and Participation's exploration of epistemic injustice, which speaks to the challenges of bringing together two groups of people with different ways of interacting with and conceptualizing the world around them. This lack of shared language may also explain why certain participants felt less able to participate or like the conversation was "over their head." Though epistemic injustice is a complex problem, with roots that extend deeply into social and cultural foundations, that won't be easily "fixed", efforts should still be made to bridge gaps where possible. In the case of scenario planning, a first step might look like a strong commitment to an on-boarding process where ground rules are established in terms of the use of jargon or where shared understandings of key terms are developed.

Together these three recommendations point to steps that scenario planning facilitators can take to begin to address issues of imbalance in participation. Though they do not get at the roots of the problem, they provide means by which some of the more obvious status-based issues can be sidestepped. More importantly, by endeavoring to minimize impacts of status-based divides, the facilitator may also encourage deeper engagement across status, which could be important for collaborations and acceptance of diverse viewpoints.

Recontextualizing the Research

The findings in response to the overarching research questions begin to hint at next steps for further study. However, before addressing these potential next steps, it is

important to take a step back and look at the big picture and re-contextualize this body of work. Below I outline four broad areas of considerations, starting narrowly with recommendations for scenario planning practitioners, expanding out to the framing of scenario planning and the benefits of studying scenario planning to better understand sustainability problem dynamics. Finally, I conclude with a discussion of the broader research framework that this research employs. The manner and mindset brought to work is as important as the tools used; as such, each of the following four sections provides a broad gaze with which to move forward from the findings of this research.

Recommendations for Practitioners

Though there is a significant body of work on scenario planning best practices that include methods of balancing participation in the room, the current study focuses specifically on enhancing just participation for sustainability. Even with best practices, there are many ways that participation can be disrupted by dynamics in the room or how the steps are executed. The findings of this body of research begin to point to ways in which facilitators could adapt the process to better serve the ethical/moral needs and obligations that may exist.

Specifically, there are four actions that can support scenario planning practitioners in leading more ethically sound events. First, practitioners should take time to genuinely reflect on their own experiences and preferences and the biases that they may create. Through this frank reflection, the practitioner may be more apt to "catch" themselves and modify their behaviors accordingly. Second, the facilitator should create a toolkit for addressing imbalance in participation. If the practitioner is well-trained, it is likely that they already have techniques they employ to balance speaking time between participants, but they should also have techniques that specifically address power dynamics. The toolkit should include, when appropriate, some of the recommendations I made in the previous section: excluding status indicators from introduction, employing small group work (at points where you intended to stay in larger groups) to get quieter participants involved, and using high status participants to "lend" their status by reporting out for lower status participants. Third, facilitators should recruit support in maintaining ethical participation. This support can come in two forms: a second facilitator and/or the other participants. Though educating participants on ethical and just participation may take additional time, this is an ideal action. It would allow for self-monitoring and would, in effect, extend the reach of the practitioner particularly during small group work where it would be impossible for one person to support all of the groups at once. If the practitioner is unable to take this step, then using a secondary facilitator will be beneficial. Ideally, in this case it would be worthwhile, if possible, to select someone that brings a different perspective and frame from that of the facilitator. Finally, wearable technology (such as the sociometric badges used in this research) can give real-time feedback on various elements of interactions including the amount of time each participant is speaking and how often people are interrupting others or being interrupted. Sociometric badges and similar computer devices cannot get at the subtleties of conversations, such as the difference between a person talking for an extended period of time because they are controlling the conversation as opposed to him or her talking more because the group asked them to elaborate on a topic. Despite the inability to differentiate contextual meaning, the badges do provide a general numeric representation of some participation

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metrics that may allow participants and practitioners to reflect on how they are engaging with others and their role in the participative process as a whole. An additional benefit of providing individuals with this type of data is that feedback that might be perceived as passing judgment when presented by a facilitator may be less charged with emotion when coming from a wearable device. Furthermore, these devices are capable of showing which participants are exchanging dialogue so the facilitator will have some baseline data on the interplay between participants in the room over time (such as whether high status people are speaking primarily to others with high status).

It is critical to note that, despite these four suggestions, as the ethical analysis suggests, much of the work that must be done is not easily standardized and requires facilitators being vigilant in identifying power dynamics that form and flex in their processes so that they can support those with less power. Though the focus of creating balanced participation is not relevant in all contexts, it may be particularly critical when scenario planning is being used in service of a social good.

Scenario Planning: From Competitive Strategy to Social Good

Earlier sections in this dissertation, particularly the Introduction and the Energy Workshop, focus on how scenario planning is a good fit for sustainability. The utility of scenario planning for sustainability is also the rationale for why it ought to be studied. However, through the Energy Workshop, I identify many occurrences of imbalanced participation that conflict with the objective to have diverse voices heard. There are incidences of high status participants speaking more frequently and receiving more attention from their peers. Conversely, there are examples of participants with less status being assigned menial tasks, speaking less frequently, and reporting a sense of inadequacy. In many ways, this suggests that the hierarchical decision making process that sustainability seeks to overcome via participative processes is still in play – except, now those with less status or social power are bearing witness to their own lack of contribution. This suggests that sustainability, with its focus on equity and pluralism, may require an additional layer of objectives than traditional scenario planning that directly addresses these underlying principles.

I contend that this redirection is a natural and evolving progression from the original objectives of scenario planning. Though scenario planning's birth and infancy were with Herman Kahn who was advocating for avoiding nuclear war, scenario planning came of age within the confines of Shell and other large corporations. Though its origins are in two different spheres - wartime and corporate strategic planning – these two areas share a foundation in competition, a desire to gain a strategic advantage on potential future opportunities. Indeed, in a list of eight reasons to use scenario planning, Schoemaker (1991) explicitly states that it should be used if your competitors are using scenario planning. These methods did not originate with an eye toward fairness and public service or sustainability and inclusivity. Instead, the process was raised in service of national security, power maintenance and organizational objectives that are often linked toward clear-cut agendas tied to market share and profit. In contrast, though sustainability endeavors also focus on strengthening security against potential threats, the focus is on human-environment challenges such as availability of energy, water, and other resources to all community members. There is an explicit current of ethics, justice and inclusivity coursing through sustainability work. This is not to say that vying for

resources or political maneuvering does not occur within the field, but such jockeying is nevertheless underpinned by concerns for the greater good. It is an open question the extent to which competition has shaped the processes involved in scenario planning, but the legacy should be questioned. It is clear that a process that well aligns with the foundations of sustainability should include a focus on intra- and intergenerational justice rather than focusing exclusively on in-groups and allies as an organizational or wartime strategy might.

While the stories about the corporate and militaristic origins of scenario planning are dominant, there is a rising tide of work in the public sector and other instances of scenario planning being used for cooperative endeavors. Caves, Bodner, Simms, Fisher, and Robertson (2013) provide an example of how this might operate in their paper, "Integrating Collaboration, Adaptive Management, and Scenario-Planning: Experiences at Las Cienegas National Conservation Area." They demonstrate how scenario planning can be incorporated in collaborative decision-making and adaptive management (CAM) situations. However, they use scenario planning as a compliment to CAM to enhance the robustness of decisions regarding the effects of climate change in the future. Since cooperative processes are integral to scenario planning focused on sustainable futures, and not simply complimenting a different methodological approach, it follows that refining scenario planning for this specific objective is a worthwhile endeavor.

This research is taking a step toward a task that must be addressed so that sustainability scientists and practitioners can fully utilize scenario planning for building strategies that are both cooperative and inclusive. Though it has certainly proven to be a valuable tool for engaging groups of people in "thinking about the unthinkable," moving forward we want to authentically include the (un)intentionally excluded, giving justified attention to role participation has in developing scenarios that account for the needs of marginalized communities – an issue critical to sustainability. Scenario planning, with its origins in competition, must now be re-evaluated explicitly and rigorously through the framework of cooperation to see where the method holds up and where it falls apart. In the areas where the scenario planning method wears thin, it must be established if there are places where patches will improve the process or if the patches will be to no avail.

In the case of this research, participation is explored as a potential "thin" area of scenario planning. It is worth noting that important questions around participation have been addressed in terms of identifying stakeholders and bringing them to the table, but this work takes it one step further to consider what they are doing once brought in on the process. Observational analysis does suggest that not all participants are participating to the same degree and some participants feel ill-equipped to engage in what I coin "authentic participation," but brainstorming and hiding status, along with the other recommendations made throughout the dissertation can serve as patches. However, through considering a customized scenario planning approach for social good and sustainability, other areas arise that should be tested for "thinness." For example, it may be important to evaluate the degree of empowerment or helplessness various participants experience as a result of scenario planning events or whether scenario planning should be framed explicitly to focus on (and include) those that are expected to bear the brunt of sustainability problems.

An example of a secondary field that would benefit from the further development of scenario planning for cooperation is socioecological resilience. Resilience, in this

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context, is "the ability of a system to absorb a disturbance and still retain its basic function and structure" (Walker, Salt, & Reid, 2006, p. 1). It is particularly focused on social adaptive capacity or the "capacity of actors in a system (people) to manage resilience" (Walker et al., 2006, p. 163). Scenario planning's benefits have not been overlooked and it is already addressed within the resilience literature due to its ability to build connectivity between players in the system (Walker et al., 2006) and increasing anticipatory learning and better preparedness for surprises and perturbations (Tschakert & Dietrich, 2010). Furthermore, the act of engaging individuals and groups in thinking about the future and its inherent uncertainty is a step toward enhancing adaptive capacity. As we have seen, scenario planning may be a zero sum game for lower status individuals who feel disempowered by a perceived lack of knowledge as a result of power imbalance. Thus, authentic and ethical participation needs to be explicitly addressed within resilience and adaptation practice. Additionally, through this lens of adaptation and resilience, we still see a socially-minded, collective focus to the way in which scenario planning is used, further demonstrating that there is a need for tailoring scenario planning for social good.

A Larger Reflection on Method

The research design is described throughout this dissertation as a multi-method, funnel approach. While this design manifests as a process of honing in (from a very broad, societal perspective, to a large group focus, to a series of small groups), the purpose was not to continually scale down, nor was it to think of these findings in terms of being singular in the directionality of reflection or insight. Instead, the purpose of mixed research designs is to use the tools necessary to get clearer on the focal issue (Bernard & Bernard, 2012; Johnson & Christensen, 2008). For example, the ethical focus presented in Ethics and Participation is critical to scenario planning, but one cannot get the ethical element clear without reflecting on what is currently happening in scenario planning event (the Energy Workshop). In turn, the information and goals of the Energy Workshop rely on insights from the Pilot Study to become further refined. The purpose of this mixed research method is to approach the focal question from multiple angles, which involves an oscillation between contextualization of information and decontextualization, and the isolation of variables, to obtain a deeper understanding.

In order to fully work through this process of pivoting between methods, there must be a continued ability for researchers to observe scenario planning events. More importantly, this method necessitates the ability to, where appropriate, have modifications implemented that are suggested by research findings. This suggests a research pathway in which researcher partners tightly with scenario planning practitioner so that findings in a laboratory setting can be applied to in vivo groups and that in vivo research can be used to better inform laboratory studies. This requires a deep, long-term commitment, along with an openness to influence, from both researcher and practitioner.

A Sustainability Problem Fishbowl

Scenario planning was introduced as a post-normal tool for addressing wicked and super-wicked problems such as those faced by sustainability scientists. However, through exploring the scenario planning process over the course of this research, it becomes apparent that there are ways in which the tool being used to address sustainability issues actually serves to mirror the issues. In his research H.T. Odum, a

pioneering figure in ecosystems ecology, employed what he coined "microcosms" by using fish tanks as a tool to learn and make inferences about lakes and other larger bodies of water (Beyers, 1964). In the same way, scenario planning events can function as the "fish tanks," or scaled-down "ecosystems," that researchers use to enhance knowledge of sustainability. In short, scenario planning events can operate as social dimension-focused, sustainability problem microcosms. Though studying these events are important for improving the scenario planning process in service of problem solving, observation of the process may be important for gaining insight and reflecting on complex social issues that we find in sustainability. It is acknowledged that large-scale sustainability involves complex systems (Jerneck et al., 2010), but we cannot lose sight of the fact that small groups, such as those in the Energy Workshop and the Pilot Study, are also complex systems that in turn act upon the world (Hackman, 2012). Simplifying them to linear process approaches of interacting members can give us a false sense accomplishment in regards to scenario planning outcomes. For this reason, I focus on nesting the multiple methods of analysis, as a way of informing what is at stake in the world and by taking both an ethnographic and experimental approach to tease apart the complex systems at play. Ideally, this work contributes to expanding the focus of future approaches to include understanding how scenario planning operates as a complex social system (Arrow, McGrath, & Berdahl, 2000).

Recommendations for Future Research

The questions addressed throughout this research could not have been answered without the multimethod approach, but more importantly this approach has served to create a set of questions and avenues for future research. Since, specific recommendations were made at the end of each individual chapter, this section is intended to compliment those more fine grain suggestions by presenting a broader exploration of recommendations. Below, I present six key areas for future exploration and investigation.

Reframing Powerlessness

Throughout this dissertation, I refer to the focal participants as low power or marginalized. This is an important distinction to make within the study of participation. Though it is important to consider and serve currently or historically oppressed or marginalized groups, it is equally important to maintain awareness of the potential for new awareness of oppression or even systemic elements that allow for new oppressed groups to form. Too narrowly defining low power or marginalized groups may also be problematic when considering the future of society, however, it must be done in such a way as to be valuable to the scenario planning process. As such, one task that must be accomplished is finding a way to operationalize or otherwise create a model for understanding and engaging with the idea of the future oppressed.

Additional Analysis of Collected Data

The current study does not exhaustively explore the full range of questions that could be answered by the data that was collected over the course of this research. For example, in the context of the experimental portion participation was the point of evaluation, however the desert survival scenario performance can be scored in terms of correctness. As such, group data can be analyzed in terms of the role of status reveal and brainstorming on decision making quality. Given the findings of the event ethnography that suggested that gender played a role in how status played out, additional analysis could be conducted with the experimental study comparing results across gender.

Understanding Participation

In strengthening the operationalized definition of participation, I have divided it into 4 key metrics: (1) Individual perception around participation, (2) Ability to engage with the group by way of being able to interrupt and contribute spontaneously, (3) Ability to fully express an idea without interruption by way of taking self turns, and (4) Total amount of time spent speaking, which on the surface aligns with more traditional extroversion-based understandings of participation. Though employing these four metrics does account for different elements of participation and different participation types, as the Framework of Participation or constructs around sustainability for social good continue to develop, additional metrics may be identified to even more tightly couple the operationalization of participation with the more theoretical work. Though, certainly, some metrics of participation within the context of power dynamics may be impossible to standardize, advancing the working definition of participation is a worthwhile task.

Iterative Exploration

As alluded to in the previous section, in terms of the broader focus of this research, the multimethod approach was an initial step in what is intended to be an iterative process.

The multi-method approach employed by this research has taken a funneled approach to addressing the issue of participation in the scenario planning process by starting broadly with understanding the ethical framework, honing in to see how participation is experienced in a real world setting, and further zeroing in on exploring the impact of very targeted manipulations on a specific element of the scenario planning process. The research flow has the potential to not stop here but, instead, continue to be used in an iterative manner where findings ultimately create a feedback loop, while engages scenario planning facilitators in the process. For example, pre-event, individuallevel brainstorming in the experimental portion of the research (the Energy Workshop) was found to have a marginal impact on success rate of interruptions but not on other metrics of participation. This variable could be tested through implementing this preevent brainstorming strategy in a real-world scenario planning event and observing the event and reflecting on the outcomes with the facilitator. Additionally, since the experimental portion only examined one element of the scenario planning process, the ranking segment, then additional experimental studies may be conducted to see how brainstorming might impact other elements of the process such as how much weight participations give expert opinions, commonly presented at the beginning of the scenario planning process, or how story development. The complexity of this process combined with the various permutations of populations in a room for a scenario planning creates significant room for further exploration. In addition to this need for deeper research in scenario planning, iterations of this work can extend in breadth to include exploration of other foresight processes and methodologies.

Focus on Participant Selection

The scope of this research is limited to a specific element of ethical scenario planning – participation. However, this assumes that there was an ethical selection process preceding the process, which is not necessarily the case. In terms of selecting participants for scenario planning, there are many questions to consider: does an ethical process give precedence to representativeness or to selecting those who are best able to consider the future? There are varying individual factors that may impact one's ability to fully engage in the scenario planning process. There are, for example, neurological differences in the ability to imagine into the future. The ability to imagine the future is directly linked to individual's ability to recall past events (S. B. Klein, Loftus, & Kihlstrom, 2002). Does this suggest that people with memory deficits should be excluded from the process? Similarly, different personality characteristics may impact one's comfort or ability to engage in the scenario planning process. For example, people who are prone to tunnel vision are also those people who have a higher need for cognitive closure (D. M. Webster & Kruglanski, 1994). As such, they will likely experience discomfort due to the ambiguity and uncertainty associated with the scenario process and have internal cognitive processes that narrow the scope of their focus. Furthermore, they may be less able to fully engage in the process of critically exploring the future. Since scenarios are intended to be shared to help a broader audience engage with ideas of the future and plan strategically, the impact of participants on the process and outcomes is important to consider. Initial work on this was conducted by Franco et al. (2013) in which they granted responsibility to different parts of the scenario planning process to individuals with different cognitive styles (as identified by their Myers-Briggs results).

However, this needs to be explored further and it may even be necessary to consider the participants' individual characteristics in light of the facilitator's characteristics. Additionally, since there are consequences associated with sustainability decisions careful weight must be given to how we choose to manufacture these events. How do we strike a balance between an inclusive process and the strongest tools/skill sets for enhancing sustainability? In other words, it is important to consider whether we would sacrifice inclusiveness in service of better outcomes.

Consideration of Cultural Context

Since participative processes for sustainability strives to include diverse participants, it is likely that there will be times when some or all of the participants may originate from a culture that is different than the culture that scenario planning originated from and found success in. In the case of the Energy Workshop, participants were from various parts of the United States and there were at least three different countries of origin. Furthermore, the two quietest participants were not American-born. There are many different factors that contribute to culture beyond geographic origin, such as race and economic status. It is important to consider how feeling outside of the dominant culture may impact participation. Additionally, cultural variation impacts how people engage within group settings (Cohen, Nisbett, Bowdle, & Schwarz, 1996; Triandis, Bontempo, & Villareal, 1988), their systems of thought (Nisbett, Peng, Choi, & Norenzayan, 2001) and how likely they are to expect change to occur in the future (Spencer-Rodgers, Williams, & Kaiping, 2010). Any of these characteristics can have significant impact on how individuals and groups may engage in the scenario planning process.

Limitations

This study employed multiple methods to strengthen the robustness of the findings, however, there are certainly drawbacks to any approach. In the context of this specific study, the primary limitation is tied to the inability to actually engage in an iterative process. One element contributing to this is associated with the difficulties of conducting multi- and interdisciplinary research. With each discipline brought into the iterative process comes a unique set of resources, skill sets and methodological approach. There is a significant resource investment requires in learning and applying these three diverse lenses. Though each gaze brings new insight and depth to understanding the problem, with each also comes a related but different body of literature and tool kit. Though this was a limitation in this study, as with any other research trajectory, over time systems and tools build up and processes become more efficient.

A second limitation of this study is tied to generalizability. The populations used as data sources in this study were from the same large, Southwestern metro region and held in the same university setting. Additionally, the focal issues in each of the contexts were specific to the local geographic and environmental conditions. Additionally, in both contexts many of the participants were already educated about or committed to the topical issue. This might impact dynamics and participation could look quite different within a different environmental or topical context or with participants with more variation in terms of investment in the subject at hand.

Conclusion

It is often stated, and also argued within this dissertation, that sustainability is committed to pluralism of values and norms and the inclusion of diverse stakeholders (Spash, 2009; van de Kerkhof & Wieczorek, 2005; Wiek et al., 2011) and, similarly, scenario planning is marked as a tool that can successfully address issues of pluralism (J. Brown, 2009; Chakraborty, 2011). The findings of this research point to ways in which we can improve the execution of this commitment through the better inclusion of ethical understanding and social psychological knowledge and tools.

This is important to ensuring that scenario planning and sustainability do not roll societal inequality in planning for the future but, instead, better serve as, not only a vehicle for enhancing human-environment relationship, but also supports the process of enhancing social justice.

Whether you consider the creative genius involved in the development of Disney or the Manhattan Project's creation of the atom bomb, collaborative knowledge brokering has allowed for significant paradigm shifts within the past century (Bennis & Biederman, 2007). Indeed, group processes are capable of eliciting rich and creative insights into a given subject, but those insights may be undercut by imbalance in member contributions to the group. The contributions of the excluded may be explicit sources of information such as subject matter expertise or context-specific knowledge that is otherwise unavailable to other members. These contributions may also be more subtle forms of knowledge such as novel ways of approaching old problems or simply thinking about a problem with divergent underlying values guiding the thought process. Though balance in group member contribution is not necessary in every context, in the case of sustainability and other socially minded endeavors, it is central to ensuring fair and just processes and outcomes. We can only assure just and equitable outcomes if all participants are heard and their ideas are included into proposed outcomes. Progress toward a deeper understanding and actualization of authentic participation is ultimately, in turn, progress toward authentic pluralism.

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APPENDIX A

HUMAN SYNERGISTICS APPROVAL



Changing the World—One Organization at a Time®

Letter of Agreement for Researchers Desert Survival SituationTM

Sandra Rodegher 17032 W Ipswitch Way Surprise, AZ 85374

(OCI®) in your research.

January 20, 2014

Dear Ms. Rodegher:

Your proposal, "Enhancing Participation in Group Oriented Processes for Sustainability" has been reviewed by Human Synergistics and I am pleased to inform you that permission is granted for the use of the *Organizational Culture Inventory*®

Human Synergistics will provide you with up to 100 Desert Survival Situation Participant Booklets for \$2.63 per booklet. Additionally, we will offer the Desert Survival Situation Leader's Guide for \$19.60. Under this agreement, Human Synergistics is not responsible for any other activities or costs associated with this project (e.g., for data analysis) or for providing technical advice on statistical analyses or the results obtained. Other reporting options will be at regular price (to be determined as needed).

In exchange for the research discount we are extending, you agree to the conditions outlined in the "Research Applications" document and summarized below:

(1) You will provide Human Synergistics with copies of all working papers, presentations, reports to sponsors, dissertations, and manuscripts to be submitted for publication which present Desert Survival Situation results or otherwise incorporate Desert Survival Situation materials;

(2) Human Synergistics has your permission to add the Desert Survival Situation data you provide to its confidential database which is used for testing and updating the norms, reliability, and validity of the inventory;

(3) Researchers **may not reproduce any of the Desert Survival Situation items or answers** in their manuscripts or in any typewritten, typeset, computerized, or translated survey;

(4) The following citation must be included in your manuscript where the Synergistics Problem-Solving Model is displayed: Copyright © 1973-2014 by Human Synergistics International. All Rights Reserved.;

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Human Synergistics, Inc.

39819 Plymouth Road Plymouth, Michigan 48170 U.S.A. P 734,459,1030 F 734,459,5557 info@humansynergistics.com www.humansynergistics.com



Changing the World—One Organization at a Time®

(5) The following citation must be included in your manuscript where the Desert Survival Situation is discussed/referenced: From Desert Survival Situation by R.A. Cooke and J.C. Lafferty, 2006, Plymouth, MI: Human Synergistics. Copyright 1989-2014 by Human Synergistics, Inc. Used by permission;

(6) More generally, you will use the Desert Survival Situation, conduct your project and report your results in a manner that is consistent with the Publication Manual of the American Psychological Association (2010) and that respects and protects Human Synergistics' copyrights, trademarks, and proprietary data and materials.

Please contact me if you have any questions. Best of luck with your research.

Sincerely,

Cheng by lasting, Ph. D.

Cheryl A. Boglarsky, Ph.D. Director of Research

2

Changing the World—One Organization at a Time®	
Letter of Agreement for Researchers Desert Survival Situation™	
Enhancing Participation in Group Oriented Processes for Sustainability	
Sandra Rodegher 17032 W Ipswitch Way Surprise, AZ 85374	
January 20, 2014	
I agree to the terms stated in this letter:	
fandre hall	
<u>Sandra Rodegher</u> print name	
Arizona State University	
organization or university	
17032 W Ipswitch Way	
Surprise, AZ 85374 address	
<u>860-608-4250</u> telephone	
sandra.rodeqher@asu.edu e-mail address	
3	

APPENDIX B PILOT STUDY IRB APPROVAL



EXEMPTION GRANTED

Michelle Shiota Psychology 480/727-8628 Lani.Shiota@asu.edu

Dear Michelle Shiota:

On 1/15/2014 the ASU IRB reviewed the following protocol:

Type of Review:	r: Initial Study		
Title:	Understanding Participation in Small Group Decision Making		
Investigator:	Michelle Shiota		
IRB ID:	STUDY00000488		
Funding:	Name: ASU Consortium For Science, Policy & Outcomes (CSPO); Funding Source ID: IIA1264,		
Grant Title:			
Grant ID:			
Documents Reviewed:	 ConsentForm_Revised.pdf, Category: Consent Form; Rodegher_HRP503A_Revised.docx, Category: IRB Protocol; Survey Questions.pdf, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); Debriefing Script.pdf, Category: Other (to reflect anything not captured above); SupplementalProtocolInstructions.pdf, Category: Participant materials (specific directions for them); HumanSynergisticsProtocol.pdf, Category: Participant materials (specific directions for them); ClassRecruitmentScript.pdf, Category: Recruitment Materials; RecruitmentFLyer.pdf, Category: Recruitment Materials: 		
	Materials; • RecruitmentFLyer.pdf, Category: Recruitment Materials;		

The IRB determined that the protocol is considered exempt pursuant to Federal Regulations 45CFR46 (2) Tests, surveys, interviews, or observation on 1/15/2014.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Sincerely,

IRB Administrator

cc: Sandra Rodegher Sandra Rodegher

APPENDIX C

SCENARIO PLANNING WORKSHOP ETHNOGRAPHY APPROVAL

	pment
	Office of Research Integrity and Assurance
То:	Aisling Kelliher BY 396
From:	Mark Roosa, Chair B
Date:	02/21/2012
Committee Action:	Exemption Granted
IRB Action Date:	02/21/2012
IRB Protocol #:	1202007406
Study Title:	Documentation of the EMERGE Workshop
The above-referenced p Federal regulations, 45	rotocol is considered exempt after review by the Institutional Review Board pursuant to CFR Part 46.101(b)(2) .
This part of the federal r subjects cannot be ident obtained not be such tha civil liability, or be dama	egulations requires that the information be recorded by investigators in such a manner that lifted, directly or through identifiers linked to the subjects. It is necessary that the information at if disclosed outside the research, it could reasonably place the subjects at risk of criminal or ging to the subjects' financial standing, employability, or reputation.
You should retain a cop	y of this letter for your records.

APPENDIX D

PILOT STUDY SURVEY

	1 strongly	2 disagree	3 somewhat	4 neither agree	5 somewhat	6 agree		7 strongly	
	disagree		disagree	nor disagree	agree			agree	
1.	I feel goo	od about th	ne final list	that my group	agreed on.				
	1	4	2	3	4	5	6		7
2.	I felt com	fortable s	haring my	opinion with t	he group.	-			_
	1	2		3	4	5	6		1
3.	I felt that	my opini	on was con	sidered seriou	sly by my g	roup.			
	1	2		3	4	5	6		7
4.	I feel that	t my grou	p worked w	vell together as	s a team.				
	1	2	2	3	4	5	6		7

SECTION ONE: Please circle the number that most accurately represents the degree to which you agree with each of the following statements.

SECTION TWO: For the following questions, please fill in the blank or check the box that most accurately describes you.

- 5. What is your age? _____
- 6. What is your gender?

□ Male

□ Female

- 7. Are you an undergraduate or graduate student?
 - □ Undergraduate (pursuing a bachelors degree)
 - □ Graduate
 - Other_____
- 8. What is your race/ethnicity? Check all that apply
 - American Indian or Alaska Native
 - □ Asian
 - □ Black or African American
 - □ Hispanic
 - □ Native Hawaiian or Other Pacific Islander
 - □ White
 - Other _____

9. Were y □ Yes	you born in the United States? If no, where were you born? If no, at what age did you move to the US	□ No ?
10. Were <u>-</u>	 your parents born in the United States? Both were born in the United States One was born in the United States, one was Neither were born in the United States 	as not
11. Are yo	ou a first generation college student? (Mean	ing neither of your parents has a
D Yes	lors degree or higher)	□ No
12. What i	 is your mother's highest level of educationa Less than high school Some high school High School Diploma or Equivalent (such Associates Degree Technical School Some College Bachelors Degree (Masters, MBA, PhD) 	l attainment? n as a GED)
13. What i	 is your father's highest level of educational Less than high school Some high school High School Diploma or Equivalent (such Associates Degree Technical School Some College Bachelors Degree Graduate Degree (Masters, MBA, PhD) 	attainment? n as a GED)
14. How v	 would you categorize your family's socioeco Upper Class Upper Middle Class Middle Class Lower Middle Class 	onomic status?

- 15. To the best of your knowledge, what is your parents' combined income? 200,000 or more
 - □ 100,000 199,999
 - □ 40,000 99,999
 - □ 20,000 39,999
 - □ 19,999 or less
- 16. Do you feel that you had relevant expertise that helped you in this activity?
 - □ Yes
 - 🛛 No
 - If yes, can you please describe it?