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COMMUNICATING CLIMATE CHANGE ADAPTATION AND RESILIENCE

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Summary

Communicating the impacts of climate change and possible adaptive responses is a relatively recent branch of the larger endeavor of climate change communication. This recent emergence, in large part, is driven by the fact that the impacts and policy/planning/practice responses have only recently emerged in more widespread public consciousness and discourse, and thus in scholarly treatment. This contribution will first describe the critical and precarious moment of when impacts and adaptation communication becomes important; it will then summarize proposed approaches to do so effectively; and discuss key challenges confronting climate change communication going forward. These challenges may well be unique in the field of communication, in that they either uniquely combine previously encountered difficulties into novel complexities or are truly unprecedented. To date, scholarship and experience in climate, environmental or risk communication provide little guidance on how to meet these challenges of

communicating effectively with diverse publics and decision-makers in the face of long-term degradation of the life support system of humanity. The contribution will conclude with an attempt to offer research and practice directions, fit at least to serve as appropriately humble attitudes toward understanding and engaging fellow humans around the profound risks of an utterly uncertain and far-from-assured future.

Keywords

Adaptation, resilience, climate change, communication, emotional responses, long-term engagement

Introduction

Communicating the impacts of climate change and possible adaptive responses is a relatively recent branch of the larger endeavor of climate change communication. It follows the longer-standing interests in communicating the science of climate change and of the need for mitigation. If serious research into climate change communication emerged in the mid-1990s, that in adaptation communication emerged about a decade later, but is now – midway through the second decade of the 21st century – a vibrant area of inquiry and practice (e.g., Heinrichs, 2010; Moser, 2014a; Wirth, Prutsch, & Grothmann, 2014). In addition to being an area of active research, several practical guides have appeared, largely oriented toward North American and European communicators (e.g., Barisky, 2015; Corner & Clarke, 2014; Pike, Eaves, Herr, & Huva, 2015; Prutsch et al., 2014).

This recent emergence is driven, in large part, by the fact that the impacts and policy / planning / practice responses themselves have only come to widespread public consciousness and appeared in public discourse, and thus in scholarly treatment, in the last 10 years. However, now that climate change is no longer just a scientific abstraction but increasingly a lived reality, and thus communication about it an imperative and a rapidly growing need, both practical experience and available research are called upon to inform best practices going forward.

The scholarship available to date on communication of climate change impacts and adaptation can be categorized into three areas of emphasis, although they clearly overlap and are interrelated. A first

body of work is concerned with the *instrumental* nature of communication in the adaptation process. It examines or argues for communication as a means or tool in adaptation (e.g., Blennow, Persson, Tomé, & Hanewinkel, 2012; Douglas et al., 2012; Houston, Spialek, Cox, Greenwood, & First, 2015; Raymond & Robinson, 2013; Reser & Swim, 2011; Tarnoczi, 2011). Work in this arena often points out that lack of communication about climate change impacts and adaptation can serve as a barrier to various actors' effective participation in the adaptation process; or, more positively put, effective communication can be an enabling factor of adaptation. Some researchers contributing to this body of work concern themselves with the strategic relationship between communicating the need for adaptation and communicating that for mitigation.

A second body of work is concerned with the communication of climate change impacts and of adaptation per se. It is concerned with the *cognitive, affective and hermeneutic* dimensions of impacts and adaptation. Researchers ask, for example, what language describing adaptation resonates with different audiences?; What do different audiences know about climate change impacts and adaptation options?; Are specific impacts perceived, observed, attributed to human-caused climate change?; What are people's cognitive and affective responses to those impacts? And how do they make meaning of their changing environment?

Finally, a third body of work is concerned with *tactical* questions: to what extent and in what ways can scientific information, specific ways of representing that scientific information, and other tools support the most effective communication of climate change impacts and adaptation? This work is often experimental in the sense of undertaking deliberate efforts to test the impact of using certain communication aids, such as graphics, visualizations, interactive games or tools, scenarios and so on.

Findings from this wide-ranging research and practical experience are discussed in the context of a number of key challenges facing researchers and practitioners alike.

Defining and Framing Adaptation and Resilience

Focusing on the question of communicating adaptation raises, first, the more fundamental question, what is adaptation? The most common responses begin from the widely accepted scientific definition, for example, as put forward by the Intergovernmental Panel on Climate Change (IPCC), which drew on decades of anthropological, ecological, and geographic research. There, adaptation to climate change is understood as 'any adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities' (McCarthy, Canziani, Leary, Dokken, & White, 2001). Researchers and policy-makers widely recognize that adaptation is a necessary complement to, not a replacement of or alternative to, efforts in greenhouse gas emission reductions (i.e., what is known as 'mitigation' in the climate context). In short, both, efforts in reducing the *causes* of climate change (mitigation) and efforts in preparing for and dealing with the *consequences* of climate change (adaptation) are needed to reduce the risks from climate change to society and the environment.

In her review of the literature on communication of climate change adaptation, Moser (2014) found that, "[t]he term 'adaptation' has been quite readily taken up in transnational, national, and more localized discussions in Europe, Canada, Australia, and Asia, as well as in development discourses but it has not always been easily accepted in the United States" (p. 339). In the US, the term 'adaptation' was found to be more readily accepted in liberal political contexts, particularly among early climate action leaders, but less so elsewhere.

If 'adaptation' as efforts in preparing for and dealing with the (expected or experienced) consequences of climate change is not always resonant, what other language is being used to express this basic idea? To make the abstract notion of 'adaptation' more meaningful in practical, politically and socially acceptable, and culturally meaningful terms, decision-makers, lay people, and professional communicators have invented neologisms such as becoming 'climate-smart', 'climate-resistant', 'climate-resilient', or 'climate (or weather)-ready'; engaging in 'climate-proofing.' In other cases, they have replaced adaptation with more familiar terms such as 'preparation' or 'preparedness', 'readiness', 'adjustments', 'planning', 'coping', 'triage' (borrowing from military and medical contexts), 'climate risk

management' or 'mitigating the impacts of climate change' (borrowing from disaster risk management). In some instances these choices are deliberately made to move the public discourse into more familiar arenas less fraught with the political charge and polarization common in the climate change context.

Among the most frequent replacements, 'resilience' or 'resiliency' is judged to be of ambivalent value for communication, although evidence is still sparse and likely highly audience- and context-dependent, thus no consensus among practitioners and researchers has emerged yet. Some argue 'resilience' amounts to unfamiliar jargon to most lay audiences – just like 'adaptation' – and as such is not preferable for communicating the importance, meaning and implications of adaptation (MacInnis et al., 2014). More familiar terms, such as 'preparedness' should be used instead. In practical experience, some point to the communication benefits of using a term that can mean different things to different people, and thus allow people to come together on adaptation-related work (a boundary object) (e.g., AGCI, 2016; Bloomberg, 2013). Finally, current scholarship disagrees on whether or not audiences interpret 'resilience' with positive valence (i.e., an emphasis on the goodness of being able to cope and maintain or return to a desired state after disturbance) or negative valence (i.e., an emphasis on the presupposition of a disaster implied by some in resilience, and therefore fostering a fear-evoking or defeatist connotation) (e.g., Cannon & Müller-Mahn, 2010; ecoAmerica, 2016) and thus whether using resilience in the context of adaptation (and even transformation) is indeed helpful (e.g., Leitch & Bohensky, 2014; McGreavy, 2016).

In many instances, the term 'adaptation' is never or only minimally used and the idea introduced instead via concrete actions that people are more familiar with: installing irrigation, building nature-based infrastructure to protect against storms, reducing fuel load in forested landscapes to reduce the risk of wildfires, or establishing heat-health warning systems, and so on. The use of diverse sets of terms for the notion of 'adaptation' is indicative of the topic's novelty in public discourse, the usefulness but also challenge of comprehending scientific jargon, the lack of access to the scientific literature where the term has long been established in various disciplines, actor preference, a desire to express or allude to different

values, the diverse intentions of communication for certain audiences, and thus also the dependence on local, situational, social, cultural and political contexts (Moser, 2014a).

In summary, adaptation as sets of activities that vary widely across sectors and contexts does not have one common language. It is sometimes expressed as a response to climate change that includes mitigation actions, thus referring essentially to any climate-related policy or adjustment to change, and is frequently addressed as an embedded or mainstreamed activity within existing policy frameworks, practices and applications (e.g., public health preparedness, disaster risk management, conservation practices, business supply chain management; agricultural risk management, planning) (Burch, Berry, & Sanders, 2013; Cross et al., 2014; Douglas et al., 2012; Howe, 2011; Lowe, Ebi, & Forsberg, 2011; Shaw, Pulhin, & Pereira, 2010; Tarnoczi, 2011). In some instances, it is linked even more indirectly to matters such as ensuring security, managing human migration, preventing vector borne diseases, or compensating for food shortages and so on, where the language of adaptation disappears altogether and is replaced with the prominent vernacular of the context in question (e.g., Lindeman et al., 2015; Ransan-Cooper, Farbotko, McNamara, Thornton, & Chevalier, 2015).

As a result of this diverse and sometimes inconsistent use of even the most fundamental terms, combined with the fact that adaptation occurs in every sector, geography and context, the adaptation landscape is not easily defined or bounded in linguistic terms. This can make research more challenging, but also offers nearly unlimited research opportunities to understand the communication challenges, needs and opportunities of societies entering a state of flux.

Communicating Climate Change Risks

One critical component of communicating adaptation is the need to identify, situate, meaningfully interpret the risks to which people must adapt. In this context, communicators of adaptation can draw on the long-standing insights from risk communication more broadly, and, in fact, existing scholarship on

how audiences perceive, understand and respond to climate change risks is largely consistent with the insights from the risk communication field more broadly.

One crucial insights from this work to date is that perceiving climate risks is crucial for adaptation readiness (e.g., Blennow et al., 2012). Whether such risk perception emerges from visceral direct experience such as living through an extreme climatic event that is attributed to or becomes associated with climate change, whether it comes from vicarious indirect experience (witnessing the experiences of others living through extremes or noticing slower changes around them, reported through the media), or whether it emerges from anticipation of a threat that is expected to occur at some future time (e.g., news media reporting on scientific studies that predict certain future changes), perceiving a risk is a necessary precondition for making adaptive changes. It serves as a (necessary, although not sufficient) motivation to undertake the sometimes significant efforts needed to change the status quo.

Scholars differ as to the importance of people accepting (or agreeing with the scientific consensus) that a perceived or anticipated risk is ultimately attributed to a human cause (i.e., *anthropogenic* climate change). The review of studies presented in Moser (2014a) found that many people observe changes, but a far smaller number understand the reasons for those changes. And even if they are familiar with the concept of climate change, many do not or cannot accept that the observed changes are anthropogenic in origin. Some scholars have found that acceptance of this human causation is another precursor to accepting the need for adaptation (Liu, Smith, & Safi, 2013; Nursey-Bray et al., 2012; Vasileiadou et al., 2014), while others have found that people can accept risks and the need for adaptation, but if human-causation is brought into the conversation, efforts stall. Differently put, the perception of change and risk itself may be sufficient to initiate the adaptation conversation, although the long-term implications of avoiding the discussion of human causation is as yet unclear.

In communicating climate risks, many focus on short-term climate variability and extreme events as analogues, precursors or expressions of climate change, although – as with all good risk communication – such choices are dependent on audience and context. For example, in some coastal locations where significant rates of sea-level rise are already being experienced, there is no need to only

rely on a particularly damaging coastal storm to raise awareness of sea-level rise. Even the slower, incipient and lasting impacts of sea-level rise are becoming apparent lived experience. For audiences that are deeply familiar with certain environments, aspects of the environment or processes (such as gardeners, farmers, fishermen, birders, hunters and so on), slow or recurrent processes can serve well to communicate climate change risks (e.g., changes in bird migration, plant phenology, dissolution of the calciferous shells of shellfish).

Generally, studies have found that effective communication of climate change risks must help audiences come to an appropriate "threat appraisal," which is moderated by varying degrees of risk tolerance (Kunreuther et al., 2013) but also aided by a range of factors (adapted from Moser, 2014a, p. 347; see also Lee, Markowitz, Howe, Ko, & Leiserowitz, 2015, and van der Linden, 2015):

- generalized good understanding of anthropogenic climate change to appropriately contextualize local experiences or available communication about climate risks in the longer-term context;
- clear and vivid risk awareness ('feeling at risk'; ability to imagine and feel the potential consequences of climate change);
- strength of belief in local effects of climate change ('seeing is believing');
- degree and understanding of uncertainty, attitudes toward uncertainty (tangibly communicated);
- degree of non-adaptive behavior (e.g., persistence of denial, wishful thinking);
- existence and belief in safety of existing protections (moral hazard of past protective behaviors and mal-adaptations);
- cultural cognition of risk (motivated reasoning); and
- trust in the source of scientific information, projections and related tools.

The communication of timing and magnitude of impacts (of when certain climate risks are most likely to manifest), as well as of the associated uncertainty are critical, but inherently difficult due to the uncertainties in the underlying science and the fundamental indeterminacy of highly complex global

change processes (e.g., Collins & Nerlich, 2016; Joireman, Posey, Truelove, & Parks, 2009; van Pelt et al., 2014; Werners et al., 2013).

Given these challenges, a large body of work on the topic is focused on the uses and effectiveness of employing various communication aids to support the communication of this inherently difficult topic. Among the means of risk communication explored in the literature various types of graphics and imagery (e.g., Hart & Feldman, 2016; Lorenz, Dessai, Forster, & Paavola, 2016), maps (e.g., Kopf, Ha-Duong, & Hallegatte, 2008), other visuals/visualization tools (e.g., digital tools [Pettit, Bishop, Sposito, Aurambout, & Sheth, 2012], video [Cone et al., 2013]; landscape visualizations [Schroth, Angel, Sheppard, & Dulic, 2014; Sheppard, 2005], and scenarios [Webb & Stokes, 2012]), interactive and participatory tools (Andersson, Olsson, Arheimer, & Jonsson, 2008; Ceccato, Giannini, & Giupponi, 2011; van Pelt et al., 2014), and narratives (Fløttum & Gjerstad, 2016; Foust & O'Shannon Murphy, 2009; Hall & Endfield, 2016; Lowe et al., 2006; McComas & Shanahan, 1999; Spoel, Goforth, Cheu, & Pearson, 2009; Uggla, 2008; Whiteley, Chiang, & Einsiedel, 2016). Not all of these studies are exclusively focused on impacts and adaptation alone, as in practical reality the communication of adaptation blends with that of the science and mitigation, but they point to the importance of such communication aids in effective risk communication.

From both experience and scholarship, one clear finding across all different types of climate change risks, sectors, and spheres of debate has emerged, namely the oft-repeated caution not to communicate risks without also communicating possible solutions and accompanying cues that increase the listeners' sense of personal, group and response efficacy (e.g., Hornsey et al., 2015; Metag, Schäfer, Füchslin, Barsuhn, & Kleinen-von Königslöw, 2016; Thaker, Maibach, Leiserowitz, Zhao, & Howe, 2016; Xue et al., 2016).

Thus, in addition to the "threat appraisal" factors listed above as motivational for people to participate in the adaptation process and accept various adaptation options are a number of "response appraisal" factors (Blennow & Persson, 2009; Frank, Eakin, & López-Carr, 2011; Grothmann, 2006;

Grothmann & Patt, 2005; Harvatt, Petts, & Chilvers, 2011; Lo, 2013; Semenza, Ploubidis, & George, 2011; Wolf, Adger, Lorenzoni, Abrahamson, & Raine, 2010). They include:

- the (quality of) information available about possible adaptation options/actions (i.e., the perceived usefulness, credibility, legitimacy and salience of the information to a specific audience);
- people's perception of the relevant actor's adaptive capacity, which may include their sense of self-efficacy (i.e., the confidence in their own ability to enact the adaptation, including skills, health, sense of control over decisions, sense of power of helplessness), group efficacy (similar dimensions applied to collective adaptive action), and response efficacy (i.e., confidence in the effectiveness of a particular adaptation option to solve the problem, which is often aided by knowledge about the effectiveness of similar actions in the past);
- knowledge of and judgements about the potential costs of adaptation actions vs. access to the necessary resources (sometimes communicated in terms of cost-effectiveness, investment in the future, or as efforts to buy time or restore certain conditions);
- clearly perceived benefits of adaptation options, including nonmonetary, intangible benefits such as protection of culturally significant places or activities, the restoration of certain environments or environmental justice);
- perceived fairness (of who bears risks, costs, benefits of certain courses of action);
- social acceptability of adaptation options (which can be influenced by a wide variety of prevalent values and the process of arriving at (compromise) solutions;
- social influences on decision-makers and the factors listed above (e.g., social norms, peers exhibiting adaptive behavior, etc.), often expressed or evident in variable degrees of community or political support and social capital; and
- preexisting levels of trust in authorities.

Many of the threat and response appraisal factors are not absolute but can only be understood in the larger context of the personal psychology of individuals involved in the communication (e.g., identity,

orientations toward the common good, personal values, attitudes toward change, roles and responsibilities), the general educational attainment of different audiences, the larger culture of a community or set of actors (e.g., organizational culture), the particular needs and challenges of a given audience (e.g., the level of urgency under which adaptation decisions are being made), the history of risk communication and governance (including transparency and level and sincerity of participation in governance), and the situational contexts of the place and time in which adaptation and related communication take place (see discussion in Kunreuther & Weber, 2012; Moser, 2014a).

Doom and Gloom: Dealing with Emotional Responses to Climate Change

Engaging with any risk is never merely a cognitive, but necessarily also an affective process (Lerner, Li, Valdesolo, & Kassam, 2015; Roeser & Pesch, 2016). Maybe this is even more true for a global, and thus easily overwhelming risk like climate change (Leiserowitz, 2005; Marx et al., 2007). A growing body of scholarship is thus devoted to better understanding the emotional responses to climate change. In early research in the climate communications field, attention was focused primarily on how these emotional responses affect the acceptance or denial of climate change science, the acceptance of mitigation policies, and the deep polarization on the issues in many, but particularly highly developed countries. More recent psychological scholarship brings attention to the affective dimensions of communicating climate change risks and of dealing with these risks, i.e., the psychological adaptations needed to cope with the unfolding reality, the psychological demands on individuals to engage in adaptive and even more transformative responses to climate change, and in the psychological responses to risks and adaptations themselves that affect people's willingness and constructiveness in engaging in the adaptation process.

Not surprisingly, one question that has emerged repeatedly in this arena is whether or not adaptation is an acknowledgment of failure on mitigation, i.e., whether talk about preparing for and dealing with the impacts of climate change implies a giving up on prevention? Some experts caution that communicating about adaptation may distract from the continued need for mitigation and result in

essential resources being taken away from mitigation. To date, no evidence has been found that communicating adaptation undermines support for mitigation (see review of relevant literature in Moser, 2014a). To the contrary, the evidence to date indicates that facing the realities of climate impacts and adaptation not only makes mitigation look comparatively easy (as the major point sources of emissions are more easily addressed than the globally dispersed but locally unique impacts of climate change); people also find it useless to try to adapt without addressing the underlying causes driving the impacts; and, in fact, those attempting to engage audiences highly skeptical of human-caused climate change have found entry points into climate action through impacts and adaptation, whereas those through mitigation remained closed off. In fact, some deliberately use the communication of impacts and adaptation as a way to overcome the manufactured debate around the scientific consensus on human-caused climate change. This is confirmed through recent research that shows that "mitigation framings may be more engaging for those with high levels of concern [i.e., those already convinced of anthropogenic climate change], whereas adaptation framings may be more engaging for low-concern individuals" (Howell, Capstick, & Whitmarsh, 2016, p. 445). Practical experience also shows that most local decision-makers have a preference for climate actions that accomplish both mitigation and adaptation goals (e.g., green roofs, urban forestry and blue carbon initiatives), giving growing confidence that concerns over having to choose between communicating mitigation versus communicating adaptation can be put to rest.

What cannot be put to rest, however, is the critical importance of the emotional responses to climate change in communicating risks and adaptation (Moser, 2007; Roeser, 2012). For many, the need to face up to the reality of (human-caused) climate change comes when climate change impacts – e.g., more frequent, bigger, and unusual extreme events – manifest locally. Oft-used phrases like "climate change comes home" emphasize how this abstract, global, impersonal phenomenon becomes utterly personal and local; the prevalent psychological distance is becoming eliminated (Jones, Hine, & Marks, 2017; McDonald, Chai, & Newell, 2015; Moser, 2007; Spence, Poortinga, & Pidgeon, 2012; Weber, 2013).

Moreover, adaptation inevitably involves the psychological task of letting go what people once had and adapting psychologically to a forever-changing world. Psychologically, this involves facing this reality in at least four ways:

- in anticipation of change (with accompanying emotions such as pre-traumatic stress, fear, worry, despair, and hopeless ness) (e.g., APA, 2009; Doherty & Clayton, 2011; Moser, 2007);
- in response to acute events, such as climatic extremes (with accompanying psychological responses such as trauma, post-traumatic stress disorder (PTSD) and further mental health consequences (e.g., Clayton, Manning, & Hodge, 2014; Morrissey & Reser, 2007);
- in response to slow losses of treasured places, landscapes, natural features, seasonal or place-based human activities (e.g., Albrecht et al., 2010; Hutchings, 2014; Lertzman, 2015; Soga & Gaston, 2016; Thomas, Mitchell, & Arseneau, 2016); and
- in response to existential fears and losses, i.e., the fears (or witness to) loss of physical safety and life but loss also of cultural, professional and personal identities (e.g., Berzonsky, 2016; Cunsolo Willox et al., 2015; Dickinson, 2009; Randall, 2009).

Effective responses to these emotional responses to climate change are not merely a matter of communication skill, although that interpersonal skill is essential. It requires additionally a certain amount of psychological sensitivity and training to effectively address, engage and be with people's emotional responses (offered, e.g., through the International Transformative Resilience Coalition; see: http://www.theresourceinnovationgroup.org/intl-tr-coalition/).

This psychological sensitivity must be paired with an ability to place adaptation discourses into the context of long-standing policy debates and reactivity to climate change (Granderson, 2014; McNeeley & Lazrus, 2014; Moser, 2013b; Wong-Parodi & Fischhoff, 2015), and understanding some of the psychological drivers underlying these responses (useful syntheses of the latter are available in Marshall, 2014, and Stoknes, 2015). Careful and knowledgeable adaptation communication recognizes that in certain contexts and situations (such as following a climatic disaster), mentioning climate change

can inappropriately politicize a situation; by contrast, in non-acute situations, adaptation can be a topic around which people are willing to come together, even if they disagree on the causes of the observed or expected climate changes (e.g., Bowers, Monroe, & Adams, 2016) and additional studies reviewed in Moser, 2014a).

Another emotional dimension frequently engaged in adaptation communication are the multiple dimensions and valences of place attachment and place identity (e.g., Devine-Wright, 2013; Devine-Wright & Clayton, 2010; Knez, 2005). As climate change threatens places, and activities and cultures associated with places, people can become protective of that place against all types of change (i.e., change driven by climate and by the adaptation), and from that stance often resist adaptation actions. In other situations, place attachment can be motivational for people to enter adaptation conversations and participate constructively in the adaptation planning process. There is no simple rule or guidance for navigating this tricky emotional terrain as people may react in one way or the other, or at times in both, to the prospect of change, but communicators are well advised to be aware and inquire non-judgmentally about the underlying responses encountered in conversations. Creating safe spaces in which people are invited to express their emotions, fully expecting that emotions are not dealt with once and for all, but that people go through denial, grief, fear, despair, anger, guilt, worry, hopelessness and so on multiple times before they arrive at acceptance, active hope, and constructive engagement, and facilitating such emotionally charged dialogues with expert assistance will go a long way toward helping communities come to terms with the unfolding realities of climate change (e.g., Doppelt, 2016; Macy & Johnstone, 2012; Moser, 2014b).

Working with people's emotional responses to climate change also means that people should not only be confronted with the risks and negative impacts of climate change. Adaptation communication, as a growing body of scholarship and practical experience shows, must be empowering (Doherty & Webler, 2016; McNaught, Warrick, & Cooper, 2014; Moser, 2013a). Communication that only paints a picture of a dark future is easily rejected as "doom and gloom" or even as manipulative, and typically results in a sense of overwhelm, denial and other defensive reactions. Thus, climate risk communication must be

carefully balanced with communication of constructive ways in which people can engage in shaping their own future, detailing concrete suggestions of actions they can take personally and collectively (political and civic actions), and providing constructive help and conveying social norms that enhance efficacy beliefs (e.g., Feinberg & Willer, 2011; Gifford, 2011; van der Linden, Maibach, & Leiserowitz, 2015).

Taking the emotional side of engaging with climate change risks and adaptation seriously leads to the conclusion that communicating adaptation is – regardless of the easier answers many communicators, decision-makers', and advocates' may wish for – not a matter of simple and repeated messaging. Communicating about a profoundly changing life environment is not a matter of persuasion, as that reality is already impinging on the collective consciousness. It is a matter of grappling, coming to terms with and accepting that reality and acting counter the human instinct and desire to keep things familiar and "the same." Thus, crucially, communication of climate risks and adaptation that takes the affective dimension of this experience seriously must enable human change – from helping people make small adjustments in their lives to becoming a support function in societal transformation. As such it will be less about educating about climate science or even just about adaptation options, and more about the difficult dialogues and deliberation required for developing and working together for livable futures. Much remains to be learned about how to do so effectively and respectfully of the emotions people experience in the face of unprecedented change (Clayton et al., 2015).

Communicating Adaptation Options and Implications

In addition to the available understanding on communicating climate risks and taking account of people's emotional responses to these risks, there is emerging scholarship on how to communicate adaptation options and their implications specifically. Most studies find that contemporary stakeholders are unfamiliar with the concept of adaptation, and quite often unfamiliar with the range of adaptation options in any one sector, which hinders their effective engagement in public adaptation processes (e.g., Cvitanovic, Marshall, Wilson, Dobbs, & Hobday, 2014; Douglas et al., 2012). Thus, effective

communication on adaptation appears as a crucial condition for effective, participatory and democratic planning and decision-making for a climate-altered future.

While some have argued that adaptation is free of the ideological battles often besetting conversations of climate science and mitigation (which, even if it were true, would require that communicators avoid the sensitive topic of attributing climate change impacts to human causation), it would be a mistake to expect adaptation – and therefore the communication of adaptation – to be free of politics (Moser, 2013b). Appropriate adaptation to climate change in many instances will require efforts in overcoming past shortfalls in governance, decision-making, management, and related public engagement and risk communication; as such it must overcome old, entrenched habits, existing governance mechanisms, the prevailing lack of (capacity for) communication and engagement (Moser & Pike, 2015; Stott & Huq, 2015), and lack of the more specific capacity and know-how on how to do these things better (e.g., Moser, 2014a; Nunn, Aalbersberg, Lata, & Gwilliam, 2014).

An emerging body of work suggests what types of adaptation options and adaptation planning processes are more likely to find acceptance among affected stakeholders (Moser, 2014a). This literature suggests that effective communication of adaptation can begin by following best practice approaches from communicating climate science and other risks more generally. For example, Moser (2014) notes,

> Basic tenets of effective practice, such as knowing one's audience, relating to people in ways that resonate with preexisting values and beliefs, engaging respectfully and addressing the whole human being, not just assuming that there is an information deficit, but also tapping into deep motivations and understanding resistances and barriers to action—all of these hold as firmly as ever in communicating adaptation. (p. 49)

More specific guidance, compiled from a number of sources (Corner & Clarke, 2014; Moser, 2014a; Pike et al., 2015; Wirth et al., 2014), includes the following:

- *Linking science with lived experience*: Many communities begin adaptation planning when their perceptions of and experiences with the early impacts of climate change rise or become prominent through incisive events or changes. This is an opportunity to link lived experience with

available science. Communicators must make careful choices around whether or not to discuss the attribution of these changes to human-caused climate change. Open acknowledgement and deliberation of multiple sources of uncertainty and their (positive and negative) implications is also critical (see Kettle & Dow, 2016, on the changing role of risk perceptions, trust and uncertainty during different phases of the adaptation planning process).

- *Improving understanding of risks*: Comparisons across time and space (i.e., trends and analogues) of experienced changes and risks to past and future risks using social statistics, visuals and other graphic aids, and culturally resonant narratives help people better understand the risks they are facing, connect to values they care about, and link to experiences they can relate to and build confidence in.
- *Connecting risks to solutions*: Much prior research and experience has firmly established that communicating risks without also communicating about solutions, or pivoting to an engagement around solution options results in dissonance, denial and fatalism. Thus, adaptation communication emerges as a crucial tool to avoid such psychological responses.
- *Avoiding adaptation jargon*: Where the adaptation terminology is unfamiliar or an ideological trigger, communicators can use the more familiar language of sectoral planning and management, preparedness/preparation and other common-sense values (e.g., insurance, ensuring a good future for our children). Using very practical examples of what adaptation involves is most accessible and will go a long way toward educating audiences of what is involved in adaptation.
- *Discovering and jointly deliberating adaptation choices*: Just as important as better understanding climate risks is to help audiences understand the sequence and range of choices available to address climate risks in specific geographies. When carefully deliberated in transparent and inclusive ways, stakeholders can engage more effectively in the complexity and many trade-offs of adaptation. Meaningful engagement is a critical component of difficult decision-processes, and while this is commonly recognized, resources to support it are rarely ever available, funding is

difficult to obtain, and all too often such engagement is thought of as a last step, rather than as an integral part of the entire adaptation processes. Creating opportunities for meaningful engagement with sufficient time (e.g., beginning this process outside a crisis situation or well ahead of critical funding, planning, and decision deadlines) makes it more likely that people come to develop a common language and trust in each other, and find common ground around concerns and solutions (e.g., Carlton & Jacobson, 2016).

- *Balancing urgency and efficacy*: If risk perception and an appropriate risk appraisal is as important as careful response appraisal and joint deliberation of the best adaptation strategies in motivating people to take action, communicating climate risks and adaptation continually walks a fine line between evoking fears and despair, possibly stimulating self-defensive reactions, hopelessness and disengagement on the one hand, and motivating people to take action on the other. Thus, critical awareness is needed at all times of the emotional responses among all involved in the communication process. Leaders of an adaptation process must take care to create spaces for and set a tone of mutual understanding and compassion (Lu & Schuldt, 2016), hope, and communal interests (Agrawala, 2011; Celino & Concilio, 2010).

Communicating for the Long Haul

Beyond these early lessons and recommended practices of communicating adaptation, there are some challenges that are unique to long-term climate change adaptation that pose challenges beyond those typically encountered in risk communication. They include:

- the risk is progressive and continuous, without an end in sight on any reasonable human time scale, and most if not all climate change impacts are likely to become more severe, more frequently experienced, or move more decisively outside the range of historical experience;
- simple technological fixes implemented by experts far away will be available only in rare cases, and will likely only be temporary;

- long lag times in the climate system necessitate that even if the causes of the problem are sufficiently addressed, the consequences will continue to unfold for decades to centuries (and sometimes even more). This also entails a time lag between taking mitigation and adaptation actions and seeing the full benefits of those actions;
- adaptation responses may eventually need to be incisive, visible, significantly altering local life and livelihoods; in some instances, they will include adaptations to irreversible consequences (e.g., sea-level rise will inundate land for thousands of years; species are lost forever);
- as impacts become increasingly disruptive, there is likely to be greater competition for adaptation resources and fewer options available even as communities increase their readiness to take adaptation actions, creating potentially contentious political and social environments in which to deliberate their futures;
- due to the long duration and worsening trends in climate change, final, durable, and altogether positive adaptive solutions for all involved are not in sight; instead even more challenging adaptations (transformative adaptation) may be required after the already-difficult choices that have to be made in the near-term; and
- uncertainty, complexity, unknowability, and surprises will be a perpetual challenge in adaptation and thus for communication.

All of these factors will create far more difficult challenges for effective engagement and communication around climate change as time goes on. They suggest the problem cannot be ignored forever, it cannot be handed over to the experts, it will affect all involved in complex and unpredictable ways, and it will – ultimately – require some very deep changes in places, livelihoods, ways of life and identity. Arguably, humanity has had few experiences of this nature to date, and none have been so globally all-encompassing, fast-paced and profoundly threatening to the functioning of modern society as those arising from climate change. Of course, the coming changes are not all inherently negative. But they

constitute deviations from that people have grown accustomed to, what they are fond of, and to which they are deeply attached.

Mainstream climate change communication to date has been reluctant to acknowledge and frame this truly adaptive challenge in such stark terms as it is incommensurate with short-term political agendas, common attention spans, and cultural inclinations to avoid, and lack of public fora to discuss, such challenging and easily overwhelming problems. Consequently, little has been said to date about how to maintain engagement and communicate climate change over long time periods or of such profound proportions (Moser, 2016).

It is indicative, however, to note the growing interest – in practice and research – in the topic of hope (e.g., Fritze, Blashki, Burke, & Wiseman, 2008; Hunter, 2009; Mcclanahan et al., 2009; Myers, Nisbet, Maibach, & Leiserowitz, 2012; Ojala, 2012a,b); see also the Special Issue of the *Journal for Sustainability Education* (November 2015, vol. 10) on 'Hope and Agency in Sustainability Education'). Much of the existing research literature does not carefully consider different varieties of hope, although a more fine-tuned, and often philosophical discussion is available in the extant literature (reviewed by (Moser & Berzonsky, in preparation). This work points to the limit of conceptualizing and operationalizing the communication of hope as "optimistic messaging" (Bennett, 2011; Hornsey & Fielding, 2016). A far more complex grappling with reality and hope is required to sustain hope over time. In-depth treatments of the topic (e.g., Lear, 2006; Macy & Johnstone, 2012; McIntosh, 2008; Orr, 2011) suggest that mature, grounded, active and even radical hope is rather different from optimism about the absence of climate risks or positive outcomes of climate action. It is not a wishing for positive, assured outcomes, but instead – regardless of outcome – a sincere engagement in action based on the perceived rightness of doing the work necessary to ensure a livable, dignified future (Stoknes, 2015).

Outlook

Considerable research and practical work remains to be done to advance the understanding of effective communication of long-term risks of climate change and adaptation responses. While the

scientific community has long understood this far-reaching and long-lasting outlook for climate change, communicators and communication researchers have paid relatively little attention to date to how short-term communication efforts affect the success of long-term climate communication, much less what is needed to sustain long-term engagement on this topic with different audiences. A Special Issue of the journal *Ecopsychology* (2015, vol. 7, issue 4), entitled after Kunstler's cli-fi novel, 'The Long Emergency' (2005), begins to make the case for such work from a psychological, not specifically communication-focused angle.

Research is needed on a number of relevant topics that would support communication of climate risks and adaptation, for example:

- how to sustain long-term engagement or reinvigorate it after lapsing;
- how to deepen it (beyond the use of dialogic formats) in ways that support the transformative changes required as climate change proceeds;
- how the common use of war metaphors (e.g., combating climate change, fighting for climate justice, engaging in culture wars), apocalyptic imagery and narratives, and the pervasive negative labeling of people with widely disparaging opinions on climate change help or hinder long-term communication;
- what can be learned from persistent non-climatic struggles (such as those for racial justice, religious freedom, gender equity, or territorial rights) for long-term communication and engagement on climate change;
- what role the humanities and arts might play in long-term communication of risks and responses; and
- how a communication of adaptation may transition into a communication of and for societal transformation, with all the challenges and opportunities involved in such deep change.

As previously argued, "climate communication practice and research must grapple with the question what communication for the very long-haul entails, and what its function might be" (Moser,

2016, p. 361). Should communication serve as transmitter of observations and witness to the environmental and societal changes ahead? Should communication instead, or in addition, provide emotional support and consolation? Should it take on the function of cheerleader or critic? How can it both reflect, respond to, mirror and support deep human needs in the unfolding Anthropocene (e.g., Doppelt, 2016; Moore & Slovic, 2013; Moser, 2014b) and do so – unapologetically – with the normative goal of safeguarding human and non-human life?

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