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From source credibility to risk perception: How and when climate information matters to action

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ABSTRACT

Information about climate change is a critical driver for individuals to take personal or collective actions to address climate issues. Empirical evidence is still weak and inconsistent, however, about how and when information facilitates climate action. Based on two rounds of survey including 1023 participants, we found a positive relationship between climate information and action, which was mediated by perceived risk of climate change. The relationship between climate information and action via risk perception was moderated by the credibility of information sources. Perceived credibility of the information providers, including both the media and organizations, strengthened the facilitating effect of information on climate action. The findings call for a more refined, credibility-based climate communication strategy.

1. Introduction

Climate change has been widely considered as an anthropogenic issue, with potentially severe and far-reaching destroy to human and natural systems (Lorenzoni et al., 2007; Whitmarsh, 2011). Among the anthropogenic sources of carbon emissions in industrialized countries that contribute to climate change, private households account for up to 20% emissions through unsustainable high-carbon lifestyles (U.S. Energy Information Administration, 2015). The public thus plays a central role in climate mitigation through individual efforts and collective actions (Whitmarsh et al., 2011). These actions are influenced by a set of factors, including personal environmental attitudes (Scott & Willits, 1994), environmental concern (Stern et al., 1995), values (Stern et al., 1993), and demographic variables such as gender (Diamantopoulos et al., 2003), age (Mohai and Twight, 1987), education (Iyer and Kashyap, 2010), income (Clark et al., 2003), and nationality (Franzen, 2003).

Among the factors that facilitate climate action, information is an important one. According to the information-deficit model (Burgess et al., 1998), the motivation for climate action can be strengthened by filling a deficit in public information and understanding of environment-related issues. The direct effect of climate information on climate actions has been confirmed in research (e.g., Obery and Bangert, 2017; Suwanto, 2013; Duerden and Witt, 2010; Du et al., 2017; Lim-Wavde et al., 2017), but two important questions remain unsolved. First,

notwithstanding previous efforts, the cognitive mechanism through which information facilitates climate action is insufficiently investigated. Second, the context within which climate information effectively facilitates actions is not well understood. There has been research that challenges the applicability and mechanism portrayed by the information-deficit model (Cash et al., 2003; Lemos et al., 2012; Mcnie, 2007).

To address these two questions, we investigate the mechanism and condition with regard to the effect of climate information on individual actions. Based on two rounds of survey of 1023 participants, we revealed a positive relationship between climate information and actions, mediated by risk perception of climate change. We further found a moderating effect of information source credibility, where information more effectively induced actions among individuals perceiving higher credibility of information providers such as organizations and media.

Our findings complement the literature in two aspects. First, responding to the argument for and critiques of the information-deficit model, we provide empirical evidence revealing the moderating role of information source credibility. Second, we uncover the mediating role of risk perception as the underlying mechanism through which climate information affects actions. Information increases individual and collective climate action by improving perceived risks of climate change to personal lives. Third, our study simultaneously considers the information provider and receiver in the same framework to provide a more comprehensive understanding of the information-behavior relationship.

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The remainder of this article proceeds as follows: Section 2 reviews the literature and develops two hypotheses; Section 3 describes methods and procedures, including analytical strategy, data collection, and measurement of variables; results and discussion are presented in Sections 4 and 5, respectively; Section 6 concludes.

2. Theory and hypotheses

2.1. The mediating role of risk perception of climate change

Climate action refers to personal or collective behaviors reducing greenhouse gas emissions (Gans and Hintermann, 2011; Choi et al., 2016). According to the information-deficit model (Burgess et al. 1998), the motivation for climate action is based on filling a deficit in public information and understanding of environmental issues. In other words, individuals need to be well-informed of climate change before they take their responsibilities and acknowledge the need to change their lifestyles to reduce greenhouse gas emissions. Previous research has confirmed the direct effect of information on climate action (e.g., Obery and Bangert, 2017; Suwanto, 2013; Duerden and Witt, 2010; Du et al., 2017; Lim-Wavde et al., 2017), but the underlying mechanism is far from fully understood (Andersson et al., 2005; Lülfs and Hahn 2013; Ones and Dilchert, 2012).

A few existing studies have identified the mediating role such as recycling attitudes (Tonglet et al., 2004) and information processing (Yang and Janet et al., 2015). Increasing evidence suggests that, however, the effects of information on climate action may be related to individuals' perception of climate change risk to their personal lives (Connolly, 2015; Cash et al., 2003; Lemos et al., 2012; Mcnie, 2007). Risk perception of climate change refers to the perception of probability that exposure to hazard caused by climate change will lead to a negative consequence to individual lives (Ropeik and Gray, 2002; Connolly, 2015). We propose that risk perception of climate change mediates the relationship between information and climate action for two reasons.

First, increased information may induce perception of higher risks. Individuals with more information on climate change are more likely well-informed of its negative consequences, such as the collapse of Antarctic ice shelves and the increasing number of hurricanes attacking the coastlines (Kellstedt et al., 2008). Information of those hazards that have happened around the world or are predicted to happen raise individuals' risk perception of climate change (Hidalgo and Pisano, 2010; Shi et al., 2015). This argument is consistent with previous research showing that provision of information about the causes and consequences of climate change is significantly correlated with climate change concerns (Tobler et al., 2012).

Second, risk perception can be a powerful motivator of behaviors (Connolly, 2015). Risk perception increases the salience of whether climate change is relevant to personal lives. Research has shown that one common pitfall in transferring scientific information into public actions is identification of information within a scientific community that has little relevance outside it (Toth and Hizsnyik, 1998; Petty et al., 2018). Individuals perceiving higher risk perception are more aware of the negative effects of climate change brought to their lives, and thus strengthen their willingness to take climate actions (O'Connor et al., 1998; O'Connor et al., 1999). This argument is consistent with previous study which shows that individuals' actions on energy consumption reduction depends on their awareness regarding climate change risk (Semenza et al., 2008).

There is indirect empirical evidence supporting the mediating role of risk perception of climate change in the climate information-action relationship. For example, Mobley et al. (2010) explore the effect of reading environmentally-related literature on behaviors. The results indicate a mediating role of environmental concern in the relationship between information and behaviors. Another empirical study finds that concern about climate change mediates the relationship between self-reported information (how well-informed the individuals feel he or she

is about climate change) and confidence to perform a specific climate action (Milfont, 2012). Thus, we propose that risk perception of climate change mediates the positive relationship between information and climate action. Our first hypothesis states:

H1. Risk perception of climate change mediates the relationship between climate information and action.

2.2. The moderating role of information source credibility

While some research suggests that information on climate change leads to public climate action, other research criticizes the information-deficit model for that information is not sufficient to induce perceptual and behavioral shifts (Owens and Driffill, 2008). This strand of research suggests a gap between scientific information and public actions, where information on climate change has a small, positive, or even negative effect on attitudes or behaviors (McKenzie-Mohr, 2000; Kollmuss and Agyeman, 2002; Menny et al., 2011; Wallquist et al., 2010); it highlights the role of information source credibility to reduce information-action gap (Cash et al., 2003; Lemos et al., 2012; Mcnie, 2007).

In addition to the critiques of the information-deficit model, previous research usually focuses on the information receivers, including their demographic characteristics and values (Stern et al., 1993; Diamantopoulos et al., 2003); the characteristics of information providers, who may also play a critical role to influence individuals' attitudes or behaviors, are usually ignored.

We propose and examine the moderating role of information source credibility in influencing the effect of information on climate perception and behaviors. Information source credibility refers to individual judgments with regard to the believability of the information provider (Hovland et al., 1953; O'Keefe, 1990, p.181; Pornpitakpan, 2004). It is proved effective in changing perceptions and attitudes of individuals (Pornpitakpan, 2004). Individuals use source credibility in heuristic processing to decide whether to accept certain information (Eagly and Chaiken, 1993; Petty and Cacioppo, 1986). They act as naïve scientists in attempting to judge whether or not the source of the information is credible (Folkes, 1988; Mizerski et al., 1979). When they perceive that the information provider is competent, knowledgeable of the truth, and tends to tell the truth, they will have less doubt about the plausibility and scientificity of the information (Cash et al., 2003; Lemos et al., 2012; Mcnie, 2007). Under such conditions, they are more likely to accept the information about climate change, perceive higher risk, and take more climate actions. In contrast, when they suspect the competence or integrity of an information provider, they will discount the acceptance of information (Eagly and Chaiken, 1975).

Empirical research provides evidence for the moderating role of information source credibility in other contexts. For example, Moore et al. (1986) examine the interactive effect of information source credibility and argument strength on individual attitudes toward brands, indicating that information source credibility enhances the positive relationship between argument strength and favorable attitudes. Herron (1996) finds that the relationship between information quality and persuasion is significant only when information source credibility is high, while the relationship is not significant when information source credibility is low. Therefore, our second hypothesis states:

H2. Information source credibility moderates the indirect relationship between climate information and action via risk perception of climate change in such a way that the indirect effect is stronger when information source credibility is higher. Fig. 1 integrates the two hypotheses together in a conceptual framework:

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