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## MEDIA & COMMUNICATION STUDIES | REVIEW ARTICLE

# An ecological model of climate marketing: A conceptual framework for understanding climate science related attitude and behavior change

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**Abstract:** Climate change is a problem that will require cooperation across different levels of government, society, community and individual action. For this reason, communicating about climate change represents a distinct challenge for marketers. This review paper proposes an ecological solution to this challenge. Using the ecological model to guide climate communication efforts could increase marketing effectiveness. This paper proposes a series of questions that marketers can use to create messages, and it shows how the ecological model incorporates the best practices from the climate communication and public health literature on behavior and attitude change.

**Subjects:** Development Studies, Environment, Social Work, Urban Studies; Communication Studies; Economics, Finance, Business & Industry

**Keywords:** environmental issues; climate change; social marketing; marketing and sustainability; ecological model

Climate change is complex global issue. Addressing it requires an unprecedented level of behavior and attitude change at all levels of society. The day-to-day impacts of climate change cannot be felt or seen but over time, they have the potential to cause great hardships to people around the

### ABOUT THE AUTHOR

Dr. Jaigris Hodson is currently an Associate Professor at Royal Roads University in Victoria, BC, Canada, and a MITACS Canadian Science Policy Fellow embedded within the Ministry of the Environment and Climate Change in the Government of Canada. Her research looks at how communication in the public interest (for example, political communication, news, and science communication) spreads online, and also considers the barriers to its transmission. This research was partially funded by a Social Sciences and Humanities Research Council Insight Development Grant exploring how digital curation can help spread sustainability research.

### PUBLIC INTEREST STATEMENT

Climate change is a messy, wicked problem and addressing it will involve tremendous changes to norms, values, and behaviors for individuals, communities and societies. Marketers working in the field of climate change related communication have an important role to play in helping influence norms, values and behaviors, however traditional approaches to climate change marketing and communication have not proven effective. As such, this article recommends adopting an ecological model of communication—currently used in public health communication—to more effectively create marketing messages that inspire norm, value and behavior change. This article illustrates the ecological model and shows how it can be operationalized to craft climate marketing messages as well as evaluate them. It shows that many different levels of human interaction, relationships, and culture lead to behavior change, and each of these levels needs to be considered in climate marketing.

world. Despite this, many people are resistant to adopt personal changes or support policies that address climate-change causing emissions. Convincing individuals that they must change long entrenched habits and behaviors in order to address something they cannot see or feel represents a huge challenge for those in policy or social purpose marketing, who are tasked with figuring out how to communicate persuasively about this growing concern. As such, climate change related marketing requires new approaches which address multiple levels of human interaction.

This review article considers how marketing related to climate change can benefit from an ecological understanding of communication. It presents insights into how a systems view of the marketing message as one which intersects with other influences a person experiences can help to increase the effectiveness of climate change related communications efforts. While explored in the context of climate change marketing specifically, this approach may also be useful for any other matter which requires a public shift in both attitudes and long-entrenched behaviors. For this reason, this article concludes with a recommendation that marketers consider the limits of a traditional information deficit model of communication, and adopt dialogic, interactive and tailored communication approaches.

This paper begins with a brief review of the challenges unique to climate-related marketing communications. It then discusses the ecological model—borrowed from literature on public health and community research—and shows how this model can be used to understand complex relationships between communication and behavior change. The model serves as a conceptual framework to map out the best practices in climate change marketing. Finally, the paper concludes by outlining a series of questions to help marketers think about their communication at each level of the ecological model. Although the focus here is on climate change communication, this model would likely be a useful conceptual framework for many different areas where marketing addresses public health policy issues, including excessive alcohol use, obesity, public safety and sedentary lifestyle choices.

## **1. The problem of climate change communication**

Climate change is a messy, wicked problem (Hodson, Traynor, Wilkes, Dale, & Petersen, 2018). Addressing it effectively requires coordinated government, community and individual efforts not yet seen on a global scale. As has been well documented, a key aspect to effective climate change mitigation requires both attitude and behavior change among citizens. Attitude change is needed for people to understand that their way of life must necessarily change to address the issue of climate change and for people to accept necessary government interventions such as carbon taxes, infrastructure changes, and emission regulation. Behavior change is needed for people to adopt daily habits and practices that will result in the reduction (and eventually elimination) of problematic emissions, or help people engage in adaptation related actions. As previous research has shown, effective marketing can lead to both attitude and behavior change (Briñol, Rucker, & Petty, 2015; Jayanti, 2010; Jones, Roberts, & Chonko, 2000; Ramirez, Tajdini, & David, 2017) however, it is also very clear that communication that begins and ends with the provision of information is not enough, and can even backfire (Hart & Nisbet, 2012). This is due to the following reasons that will be discussed here in turn: the inherent limitations of an information deficit model of environmental communication; the problem of information overload and message fatigue; the difficulties that a lay public can have with interpreting climate science messaging; and finally, the role of social identity and key values in forming beliefs about climate change.

### **1.1. Limitations of the information deficit model**

While many public interest communicators like to lead with the provision of information in the hopes that it will change hearts and minds (Hadfield, Howse, & Trebilcock, 1998; Sweeney, Kresling, Webb, Soutar, & Mazzarol, 2013), this information deficit strategy can be limited in its effectiveness, particularly in the realm of climate policy marketing (Owens & Driffill, 2008). A recent review of the literature confirms this, showing that attitudes, emotions, norms and values all play a role in

how a person receives information about climate policy (Wibeck, 2014). The way content is presented may influence whether people engage with the information being provided. Something as seemingly straightforward as the choice of image accompanying a story about climate science or climate change can impact how people engage with the information being provided (Nicholson-Cole, 2005). Similarly, narrative seems to be more important than fact-based communication for climate change related messaging. A compelling narrative will produce a more efficacious message than the simple provision of scientific facts (Hinyard & Kreuter, 2007).

### **1.2. Information overload and message fatigue**

An issue closely related to the challenges of the information deficit model of communication is the fact that the current media environment is one of information overload. When people are overwhelmed with competing claims, they often tune out, and if they do not feel empowered to act on an issue like climate change, they may even experience message fatigue if the same message is repeated too often. While social and participatory media were originally thought of as efficient and cost effective ways for policy makers, and non-profit organizations alike to communicate sustainability messages like climate change (Dale, 2005; Hodson et al., 2018), in practice this activity has proved more challenging than expected. The participatory natures of platforms like Facebook, Twitter and YouTube present unique barriers to climate messaging. There is so much content produced and shared on social media platforms, that filter failure becomes an issue (Shirky, 2008). Filter failure occurs when people have a difficult time finding information they can trust simply because there is so much information available. When this happens in the field of climate communication, people may turn to traditional media outlets to help guide their engagement with messages (Lineman, Do, Kim, & Joo, 2015), they may draw upon the information provided to them in their communities, social groups or families (Hmielowski, Feldman, Myers, Leiserowitz, & Maibach, 2014), or they may look for online or offline influencers for guidance (Schäfer, 2012). Information overload may also lead to online echo chambers (Hodson et al., 2018; Pariser, 2011; Williams, 2015), or it can lead to people tuning out the message altogether.

### **1.3. Interpretation of data by a lay audience**

Even when people do engage with the information that is provided to them, they often have trouble interpreting it, or have difficulty remembering specifics. Research by Maibach et al. (2015) looked at Americans' awareness of the health effects of global warming, along with levels of support for government funding. Findings revealed that while people indicated an awareness of the health effects of global warming, they were unable to name specific health impacts, and support for government intervention related to public health and global warming was lacking. Research has shown that even very well educated people do not understand the dynamics of climate change, nor the relationship between climate change and emission reduction (Broomell, Budescu, & Por., 2015; Sterman & Sweeney, 2007). The majority of Americans have misconceptions about climate change, chief among them the belief that climate change is a distant threat (Leiserowitz, Maibach, Roser-Renouf, Feinberg, & Rosenthal, 2015).

### **1.4. Social identity barriers**

Identification with a particular group will tend to lead a person to hold values that resonate with that group. Sometimes this can help spread climate related messaging, but in other cases it works at cross-purposes to climate messaging efforts (Bennett, 2012). For example, several research articles note a negative relationship between conservative or right-wing identification and belief in climate change (Hart & Nisbet, 2012; Whitmarsh, 2011; Zia & Todd, 2010). In fact, Whitmarsh (2011) showed that skepticism is more likely to be correlated with personal values than with education or demographic levels. Conservative media use is correlated with a decline in levels of trust for science (Hmielowski et al., 2014). Research by Hamilton (2011) shows that while level of education used to be related to belief in climate change, political identification has become a more important predictor, meaning that well educated conservatives are more likely to feel skeptical about climate science than they may have been in the past.

Similarly, community norms help to drive engagement with climate mitigation behaviors (Corner & Randall, 2011). If one lives in a community mainly supported by, for example, emissions heavy work like work in hydraulic fracturing, one will probably be less likely to engage in climate mitigation behavior and more likely to be skeptical about climate change. When researchers examined three distinct groups of people (scientists, the general public, and politicians) about climate change, they found more alignment on climate science among scientists of every type, and increased climate skepticism and polarization among the general public and politicians (Bolsen, Druckman, & Cook, 2015). While this may be related to education level, it is most likely related to group norms and values, in which scientists would tend to align with the scientific consensus on the issue.

Online, social identification with those of similar values seems to only increase as a result of network effects (Pariser, 2011). With respect to the communication of climate science information or climate mitigation behaviors, this means that social media or digital marketing communication may not work (Itkonen, 2015), and thus other strategies are needed to overcome online network effects. Spartz, Su, Griffin, Brossard, and Dunwoody (2017) showed that while the number of YouTube views of climate science based videos can drive the perception of whether the issue is important, popular videos do not lead to attitude changes on the topic. Perhaps this is due in part, by how easy it is to find conflicting information in the current media environment. The vast choice in media both on and offline may pose a challenge for marketers working in the climate space, since people tend to consume media that reinforces their already existing beliefs about climate (Metag, Füchslin, & Schäfer, 2017). Research by Feldman, Myers, Hmielowski, and Leiserowitz (2014) showed that in addition to conservative values being more likely to make people feel skeptical about climate change, they also form something of a self-perpetuating cycle, insofar as people who have conservative values are more likely to consume media reinforcing those values, which in turn is more likely to reinforce and entrench climate skepticism.

## **2. Climate change related marketing best practices**

To address the climate science communication challenges described above, researchers have proposed approaches that can be mapped roughly onto four themes: Currency, message personalization, community, and trust. This section will examine each of these themes in turn, and then will propose a framework for thinking about climate policy messaging based on an ecological model of communication.

### **2.1. Currency**

In the literature, currency can refer to two things: first, the timeliness of the message, and secondly, the influence of the person or organization delivering the message. In part, currency helps to overcome the challenge of information overload. Trusted influencers help people to filter the wealth of information they are exposed to on a daily basis, while timeliness is another cue that people use to determine what to pay attention to. With respect to message timeliness, Olteanu, Castillo, Diakopoulos, and Aberer (2015) collected tweets related to climate change and analyzed Twitter activity for patterns. Their research showed a positive correlation between real world events or announcements related to climate and online interest in the topic. Similarly, Lineman et al. (2015) collected search data, which showed a positive correlation between the number of searches performed and discussions of climate in other media sources. Research by Jagers, Lofgren, and Stripple. (2010) showed a significant positive relationship between stories related to climate change in the mainstream media and support for climate mitigation policies. With respect to influencer currency and message impact, Moser's (2010, 2011) research showed that the use of influencers helps to make climate science communication more effective. Williams, McMurray, Kurz, and Hugo Lambert (2015) showed the importance of highly connected influencers for framing the climate science conversation on Twitter, and their research showed that climate science influencers tended to be more effective than climate skeptic influencers with respect to reaching a broad audience. In

this case, an influencer with currency can be thought of as someone well connected in their network, whose messages could be seen by a high number of other people. Sometimes multiple influencers may be needed to overcome any potential echo chamber effect (Williams, 2015).

## **2.2. Personalization**

A large body of literature exists which discusses the importance of shaping climate change message content to fit the audience (Fresque-Baxter & Armitage, 2012, Itkonen, 2015; Moser, 2010; Zia & Todd, 2010). Part of tailoring the message means using the best platform to reach the specific desired audience. Sometimes messaging should even rely on multiple platforms or multiple media of communication (Maynard & Bontcheva, 2015; Webb, Joseph, Yardley, & Michie, 2010). For example, Lorenzoni, Nicholson-Cole, and Whitmarsh (2007) found that barriers to engagement with climate change can occur at both the individual and the social level, and can be mitigated if the message is adapted to its audience. And Lustria et al. (2013) conducted research that showed that tailored public health messages outperformed non-tailored messages. This is arguably even more important when crafting messages for online and digital platforms, argues Bennett (2012, 2012).

Overall, researchers agree that content matters. It should empower the person for whom it is tailored, by avoiding fear based appeals (Hodson, Dale, & Clifton-Ross, 2018; O'Neill & Nicholson-Cole, 2009), instead focusing on the positives (Hodson et al., 2018; Pruneau, Khattabi, & Demers, 2010; Bamberg, 2013). Interest in climate change and hope for the future are associated with policy support (Smith & Leiserowitz, 2014). Interactive content is highly efficacious, as it provides immediate feedback for the audience on preferred behavior and offers an engaging experience of the material (Eisenack, 2013; Anderson, 2012; Krebs, Prochaska, & Rossi, 2010; Webb et al., 2010). The use of images, video, or data visualizations can be particularly useful, but these too should be tailored to the audience and platform (Hodson et al., 2018; Nicholson-Cole, 2005; O'Neill & Nicholson-Cole, 2009; O'Neill, Williams, Kurz, Wiersma, & Boykoff, 2015). Like currency, personalization can help address message fatigue, since messages are deliberately crafted to stand out to and engage the audience. This approach could also help to overcome the problem of data being misunderstood by a lay audience, since personalizing the information means data dumps are avoided and information is deliberately provided in a way that is accessible to the audience (Hodson et al., 2018).

## **2.3. Community**

Humans are social animals, who often look to the communities around them for cues on preferred attitudes and behaviors. For this reason, much of the literature recommends crafting communication to speak to community values (Bennett, 2012; Bolsen et al., 2015; Feldman et al., 2014; Roser-Renouf, Maibach, Leiserowitz, & Zhao, 2014) and whenever possible demonstrate the preferred behavior and attitude change as a social norm (Bangay and Blum, 2010; Metag et al., 2017; Plotnikoff, Wright, & Karunamuni, 2004). Targeting communities with values based messaging addresses the challenge that social identity presents for climate communication. By embedding the message within communities where people already identify, and by framing the messages to address values, it is possible to communicate in a more effective way way. Community identification takes many forms, and can mean identification with a certain geographic community (Fresque-Baxter & Armitage, 2012; Jang & Hart., 2015), political group (Roser-Renouf et al., 2014) or sector/career path (Bolsen et al., 2015). Sometimes these different identities intersect. In reaching a community, influencers can play a role, but in this case, rather than looking for influencers with the highest level of reach, one would deliberately target smaller influencers that have a high level of community trust (Moser & Dilling, 2011).

#### 2.4. Trust

People who indicate trust in government are more likely to be supportive of policies intended to mitigate climate change (Jagers et al., 2010). Unfortunately, however, public trust in government, particularly in North America has been recently in decline (Citrin & Stoker, 2018). To overcome this, marketers must be more mindful than ever of engaging in marketing initiatives that help to increase trust. One of the ways to do this is to make sure that marketing messages are aligned with broader social values, particularly environmental values, even if that means engaging in demarketing (Ramirez et al., 2017). Marketing messages must also be aligned with institutional actions. For example, if a marketing message encourages citizens to reduce their carbon footprint by driving less, but this message is not backed up by increased support for transit, or behavior modeling by institutions and their representatives, the marketing message is set up to fail (Lorenzoni et al., 2007; Semenza et al., 2008).

Trust can also be increased if messages are spread in both a top-down and bottom-up (or grass-roots) fashion (Ockwell, Whitmarsh, & O'Neill., 2009). For example, research indicates that climate scientists can serve as trusted influencers, suggesting that aligning with scientists for a climate related marketing campaign may be an effective strategy (Hamilton, 2011). Similarly, NGOs can be a trusted and effective partner for sharing climate messaging (Schäfer, 2012). Keeping messaging consistent with actions and aligning messages with trusted sources of information can help to overcome the limitations of the information deficit model, since people are more likely to believe information when it is consonant with behavior and/or if it's coming from a trusted source. In a world of information overload, this makes the building of trust a crucial activity for marketers.

Though the literature details how each of the above approaches can help increase the effectiveness of climate change related marketing, and some of the literature does address multiple approaches, a gap exists in understanding the problem of climate science marketing in a systemic way which takes into account all best practices. For this, adopting an ecological model of communication is helpful. This model can help marketers in the area of climate change or other public health or social marketing areas understand how to craft a message for the best possible impact, and can help marketers better understand the link between messaging and attitude or behavior change in a relational context.

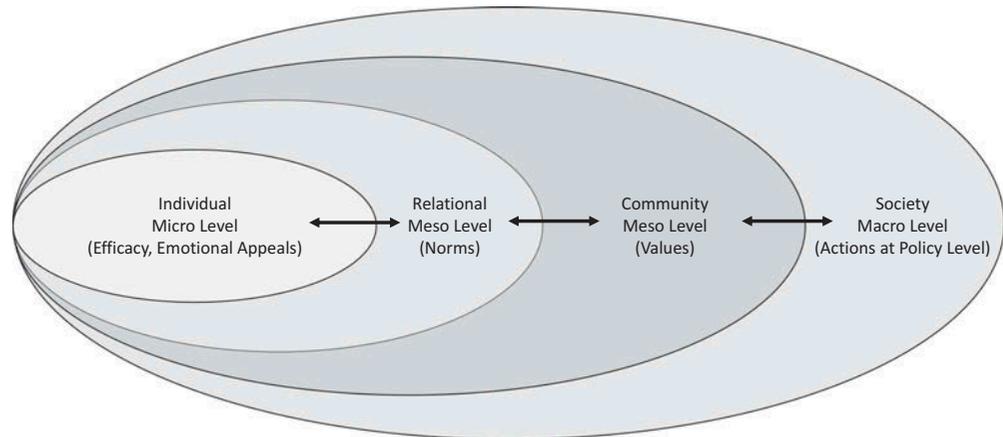
### 3. An ecological model of climate communication

The ecological model is more than an appropriate metaphor for understanding climate communication. It is a useful framework to guide policy marketing that allows marketers to incorporate the best practices described above. The social-ecological model was originally developed by Bronfenbrenner (1977) and was used to guide recommendations for behavior change in the fields of public health, community engagement, and social work. More recently, it has been used to understand behavior and attitude change in increasingly varied fields, including organization studies (Cukier, Gagnon, Lindo, Hannan, & Amato, 2014; Hodson et al., 2018a), communication (Dresler-Hawke & Veer., 2006) and social media use (Hodson, Traynor and Wilkes, 2017; Hodson et al., 2018b), and it is these last two fields to which it can be understood and applied usefully here.

The ecological model positions attitude and behavior change at multiple, increasingly broad levels of interaction around the individual. Each individual actor is at the center of different overlapping forces that can influence an attitude and behavior change, and thus each overlapping area of influence can serve as a possible site for a marketing initiative. In the ecological model, the individual is located at the micro level, influenced by close relationships, or by their broader community (including organizations in which they spend their time), this occurs at the meso levels. At the macro level, systems, structures (like policies) and values that guide interactions at both the meso levels and the micro level can be found. A graphical representation of the ecological model can be seen in Figure 1.

Importantly, the ecological model allows influence to occur in both directions. That is, while individuals are influenced by both the meso and macro levels, the meso and macro levels can also

**Figure 1. The ecological model, adapted from Cukier et. al., 2014.**



influence each other and be influenced by the individual. This means that an action taken by an individual can have ripple effects through their community and sometimes even influence broader systemic forces and values. Community or relational actions can influence the individual and also radiate up to broader policy or systems change, and policy, systems or value changes can influence communities or organizations and through them often change the minds and practices of individuals.

### **3.1. The ecological model and participatory environmental governance**

Somewhat related to, and developed from, Bronfenbrenner's ecological model, a participatory model of environmental governance suggests that individuals and communities need to be actively involved in decisions that impact the environment or ecology that surround them (Bäckstrand, 2003). This necessarily facilitates the involvement of political, organizational and individual actors at all levels, such as community groups, NGO's, educators, and all levels of government from the local to the national. Though this model does not directly concern communication of climate science, it is important to note that for this model to work, communication must reach different levels of the individual, community and society (Newig & Fritsch, 2009). In fact, one could argue that communication to and between the different stakeholders at individual, community and societal levels is essential (Newig et al., 2018). For this reason, it is imperative that communicators follow an ecological model of marketing communication in order to reach the different stakeholders involved in participatory environmental governance. Otherwise communication will not be able to change norms and behaviors related to climate change mitigation and adaptation.

To date, much of climate marketing has focused on targeting single levels of the ecological model. For example, advice to make or avoid certain types of emotional appeals in climate messaging targets the individual level. Similarly, advice for policy makers to adopt carbon pricing or electric car rebates is approaching the problem from the macro level, suggesting that these policy instruments will result in behavior change through a type of nudge that will ultimately impact individual attitudes and behaviors. These claims are not wrong, however, the ecological model reminds us that they only tell part of the story. The next section will map out a way to think about climate communication using an ecological model, and then will propose a systematic ecological approach to climate marketing as an alternative to existing climate change communication practices.

### **4. Mapping climate communication recommendations**

Though most of the climate communication literature has not directly referenced the ecological model, a few studies are beginning to show evidence that a holistic approach, taking into

account different relationships and interactions is necessary for effective climate related communication. Maibach, Roser-Renouf, and Leiserowitz (2008) specifically recommend an ecological model of public health be used for marketing related to climate change, since targeting multiple levels of interaction is an important driver of attitude and behavior change, however, they stop short of offering a direct application framework for marketers, and as of the publication of their 2008 paper, were unable to fully articulate interventions at the meso and macro levels of interaction.

Other work lends support to an ecological understanding but does not address the ecological model directly. Hestres (2014) suggests that the reason why climate change is such a “wicked” (n.p.) problem is because attempts to address it need to occur at multiple levels of government and society. (Semenza et al., 2008) suggest that government policy must work in tandem with interventions aimed at increasing awareness or concern on the topic. Mead et al. (2012) show the role that families play in influencing individual young people about climate change. Phipps and Brace-Govan (2011) suggest that in order for changes in water consumption patterns to be enacted, initiatives must be made that both include information targeted at individuals and also speak to broader social and societal values. Wibeck (2014) shows how social interactions, social norms, values and attitudes play a role in the acceptance of climate science. Though she does not mention the different levels of the ecological model directly, it is not a stretch to see that attitudes could occur at the micro level, social interactions could occur at the meso level, social norms could occur at the meso and macro levels, and values could occur at the macro level. It is possible to map out the recommendation along the different levels of the ecological model as follows:

Importantly, as seen in Table 1, above, some of the recommendations can work at multiple levels, and as with the ecological model generally, different interaction levels may overlap simultaneously (such as, for example an interaction with colleagues at the office, which could involve both relational and organizational interactions at the meso level, but also incorporate macro level norms, values, or policies). As Table 1 illustrates, currency and trust tend to take place mostly at the macro level of the ecological model, with some influence at the meso level, personalization of messaging tends to occur at the micro level, and community tends to occur at the meso level, but can also be considered at the macro level.

How can the ecological model help marketers create messages that overcome the challenges described earlier in this article? The ecological model illustrates how many different relational, social and societal forces influence individual behavior and attitude change. This can serve to remind marketers that a simple provision of information is unlikely to be effective unless the information is consonant with individual attitudes, group norms and values, and broader structural values and practices. It also may help explain why, despite years of climate science communication, people still do not understand or cannot recall some basic facts about climate change. The

**Table 1. Best practices, tactics and level of ecological model: An overview**

| Best Practice   | Associated Tactics                                       | Level of the Ecological Model |
|-----------------|--|-------------------------------|
| Currency        | Timeliness<br>Influence                                  | Macro<br>Macro-meso           |
| Personalization | Content<br>Emotion<br>Interactivity                      | Micro<br>Micro<br>Meso-micro  |
| Community       | Norms and Values<br>Place Recognition<br>Platform Choice | Macro-meso<br>Meso<br>Meso    |
| Trust           | Policy Actions<br>Influencers                            | Macro<br>Meso                 |

ecological model is also uniquely suited for understanding the current digital information environment (Hodson, Traynor, & Wilkes, 2017). An ecological understanding of information allows for the fact that information is no longer solely produced in a top-down (macro) fashion, but is produced at all levels—by individuals, by small social groups (social media posts, for example) and community organizations, and finally also by large organizations and professional communicators. Given the focus on different types of relationships, and the ability of the meso and macro levels of the ecological model to account for values and social norms, the ecological model allows marketers to understand communication as occurring within and in negotiation with social values, norms and relationships—a consideration that is often left out if the focus on marketing is primarily content based.

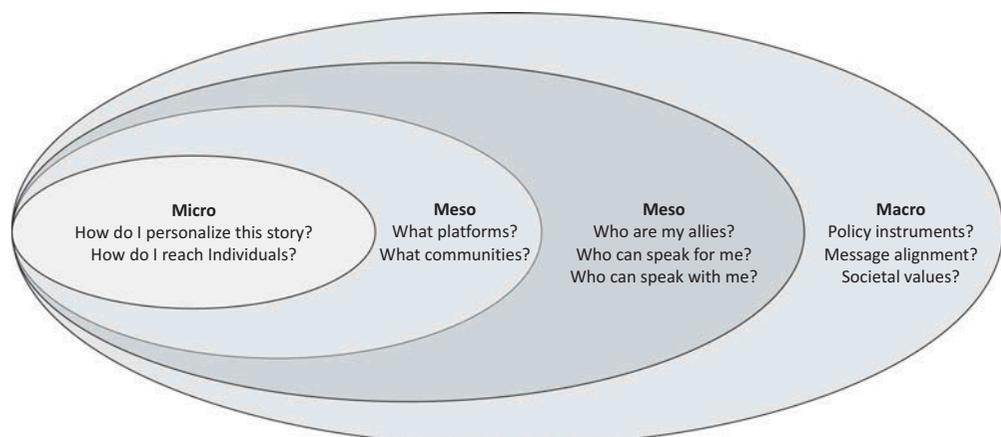
### 5. Understanding climate communication as an ecological model: Marketing implications

Building on Maibach et al.'s (2008) nascent work on an ecological model of climate communication, this section proposes a series of questions to guide marketers working in this space. These questions can help marketers think about all levels of the ecological model, in order to design effective communication targeted at behavior and attitude change. Overall, this model provides a useful framework to guide the discussion about climate marketing communication, and could thus potentially help marketers to think through potential marketing challenges before they occur. Figure 2 shows a modified ecological model. This new model shows a format for asking the above questions, and maps them according to whether they address the micro, meso or macro levels of interaction.

Starting at the macro level, public interest marketing practitioners can ask the question of how changes in attitude or behavior that they are attempting to inspire with their marketing efforts aligns with their own organizational, sectoral, or social values. Communicating the alignment is crucial. Even more importantly, if an alignment is hard to find or does not exist, it is imperative that marketers understand that the desired change may be more difficult to achieve. Sometimes marketers in a field like climate change communication may want to communicate change before an appropriate policy is put into place, in the hopes that a behavior change at the individual or community level will inspire grassroots support for a proposed policy. In this case, the ecological model suggests that change is possible, but in order for it to occur, marketers must be even more cognizant of ensuring their communication efforts align with broader social or societal values if they want to be effective. Marketers must recognize communication beyond the content of the message—look at what the organization's actions communicate and also make sure the message aligns with the evidence—not simply as portrayed scientifically speaking, but importantly the evidence as different audiences see it.

At the meso level, it is important to look at platforms, communities, and potential allies. Building the right alliances will not only allow marketers to achieve greater influence and reach broader communities, but it can also impact trust. That is why consideration of the questions at meso level

**Figure 2. Questions to guide climate marketing.**



one and two are most crucial. Meso two questions encourage marketers to find potential allies through an appropriate environmental scan. What influencers in community groups, geographical areas or fields of study are already aligned with the message you want to communicate? Is there any one that you can invite to help you tell your story who may be better received if they, rather than you, share the message. This particular consideration may be of utmost importance in the current information environment, in which trust of government messaging is quite low (Citrin & Stoker, 2018). At the meso one level, questions ask marketers to consider what communities will be most receptive to the message, and which platforms are best to reach those communities. It is here that it is easiest to see the ways that the ecological model can work in both directions. If, for example, a policy marketer wants to reach a community that is not immediately receptive of the message, it is important to go to the macro level of the model and assess value alignment, asking how might the message be better aligned with the values of the community (Feldman et al., 2014).

At the micro level, policy marketers want to personalize their messaging efforts as much as possible. Questions asked at this level thus include how can the story be made personal? And how might the message be targeted to individuals? Here, marketers can rely on emotional appeals, or the rhetorical use of pathos and ethos. The answers here must also necessarily take into account values, both societal and community, and influencers, who may allow marketers to more easily reach individuals. Importantly, if the right influencer is targeted with the right message using the right channel, there is a possibility that changing the attitudes of that influencer could have ripple effects on a broader community. This is the power of the ecological model as a frame for communication. Since it allows influence in both a top down and bottom up fashion, it gives marketers different potential entry points for communicating about climate science.

Answering the questions at all levels of the ecological model allows for the application of those best practices that make sense, when they make sense for a particular communication initiative. Marketers should consider the fact that while it is possible to target communication at any one point of the ecological model, the strongest or most effective communication will occur when they consider all levels in their practice. Particularly with a wicked problem like climate change, which requires individual, community and societal efforts to change, communication that spans the micro, meso and macro levels will be the most effective way to address this issue. Finally, adopting an ecological model of communication fits within a participatory framework for ecological governance. It fosters a consideration of the different actors at different levels whose needs and values are key to effective environmental stewardship, and as a result, in the case of climate change communication, it is more likely to encourage effective changes in norms and behaviors.

## **6. Applying the model: the ecological model in climate marketing research**

In addition to using the ecological model to craft climate marketing messages, the model can be considered when researchers are evaluating the role and effectiveness of climate change related marketing efforts. The best way to use the model for research stems out of work by Cukier et al. (2014) or Dresler-Hawke and Veer. (2006), and uses the questions posed in Figure 2 as a guide to develop questions for marketers about the ways they are crafting climate messaging. Interviews or surveys developed using these guiding questions could determine what levels of the ecological model marketers are tapping into when they develop climate related messaging, and could then introduce areas for potential interventions that would improve the messaging. Marketers could be asked to identify the emotional appeals and personalization techniques they use to show the micro level aspects of the message, they could be asked about influencers, platforms and audiences to show the meso aspects of the message, and they could be asked about how the message works with broader policy instruments or social values to uncover the macro aspects of the messaging. A limitation of this approach is that by focusing only on those who are developing messages, the research will not show whether the message is received as intended. For this reason, a multi- methods approach that also looks at the receivers of the message could help to develop a broader understanding. This would ideally involve a multi-methods approach which includes a content analysis of the marketing messaging combined with interviews of individuals

who either are exposed to or have developed the message, and should involve questions that address each level of the model as seen in Figure 1.

More specifically, a content analysis of the messaging can be conducted to pinpoint various levels of the model at which the messaging is operating. A content analysis would code messages based on emotional appeals (micro), communicated norms and values (meso). Then, conversations or surveys of the people involved in messaging, either the marketers themselves, or people who receive the message can reveal relational and structural aspects of the message. Such questions would seek to determine whether people see the marketing messages supported in broader policy decisions or broader social and cultural norms, or could inquire what policies marketers hope are reflective of the climate messaging. This line of questioning helps to determine the relationship between the message and broader structures at the macro level of the model.

### **7. Limitations and future research**

The ecological model has to date been used extensively in communications aimed at changing health related norms, values and behaviors, however, it has not yet been used directly for the crafting or evaluation of climate change norms, values and behaviors. This paper has shown that climate change could be an excellent fit for an ecological approach to communication. It has operationalized the model, showing how marketers and marketing research can think about each level in the development and evaluation of messaging. Now, it is important that the model and the recommendations for its implementation be thoroughly tested with respect to climate change marketing. Future research can use the guides provided here for implementation and evaluation to test whether effective climate messaging indeed meets the criteria for different levels of the ecological model. It could also introduce interventions at each level of the model to see what impact interventions at the micro, meso or macro levels have on reception of the message as a whole, and whether certain levels are more effective at inspiring norm or value changes than other levels. Furthermore, future directions could measure the relationship between an ecological model applied to marketing communication and the effectiveness of participatory environmental governance by looking at the ways different communication initiatives either support or undermine participation at the various levels of the individual, community and society. As this research project continues to move forward, it is expected that it will address many of these current limitations, with projects both looking at the content of climate marketing messages, and also projects looking at how the messages are received.

### **8. Conclusion**

Sometimes, marketing communication related to an ecological issue requires an ecological approach. This paper has detailed how the unique challenges of climate change communication cannot be addressed through the information deficit model of communication. It has shown why marketers must approach climate change marketing communication in a holistic or systematic way, how the ecological model can serve as a framework for structuring more effective communication related to climate change and climate science. The ecological model illustrates that each individual is influenced by, and also influential at, different levels of relationships or interactions. At the micro level, individuals have their own attitudes, habits and opinions that may impact how they receive and process a marketing message. At the meso levels, individuals are influenced by the attitudes, beliefs and norms in their families, communities, and workplaces. Finally, at the macro levels, national or international policies, societal beliefs and values, and globally accepted norms play a role in how an individual receives a message. This can work in reverse as well, since an individual's changing behaviors and attitudes can sometimes influence their families and communities which in turn can have ripple effects outwards. The ecological model of communication addresses specific needs within participatory environmental governance. It helps different stakeholders to communicate with each other, and also helps to guide effective information transmission to the communities that need to be involved in environmental governance. By answering questions at all levels of the ecological model, marketers can address the best practices outlined in the marketing literature, and as such are in a much better position to create effective messages related to climate change mitigation or adaptation.

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