

# A Conceptual Critique of the Cultural Cognition Thesis

Science Communication

1-11

© 2015 SAGE Publications

Reprints and permissions:

sagepub.com/journalsPermissions.nav

DOI: 10.1177/1075547015614970

scx.sagepub.com



Sander van der Linden<sup>1</sup>

## Abstract

I offer a critique of the cultural cognition thesis. I argue that cultural cognition is not a theory about culture or cognition per se; rather, it is a thesis that aims to explain why specific American groups with opposing political views disagree over a select number of contemporary science issues. I highlight that cultural cognition can be characterized as a “strange loop” as it frequently defines its core theoretical properties (e.g., group, culture, political ideology) in terms of one another. The approach also overgeneralizes specific findings from social psychology and underappreciates the many audiences that comprise the general “public”.

## Keywords

cultural cognition, science communication, motivated reasoning, critique

What is the *Science of Science Communication*? In a recent essay, Kahan (2015) advances the study of “cultural cognition” as a prime example of how the “science” of science communication *should* be conducted; hands-on and empirically driven in a manner that is distinctive of “scientific inquiry” (p. 1). Interestingly, little commentary has been offered on the theoretical foundations of cultural cognition as a broader approach to science communication. This is surprising, as Kurt Lewin (1951) once said, “There is nothing more practical than a good theory” (p. 162). What is meant exactly by “culture” and “cognition”? And how can these concepts be effectively applied to the study of science communication? In this commentary, I would like to offer a more theoretically oriented perspective on the cultural cognition thesis in a humble attempt to improve the way in which we conduct the “science” of science communication.

---

<sup>1</sup>Princeton University, Princeton, NJ, USA

## Corresponding Author:

Sander van der Linden, Department of Psychology, Princeton University, 421 Peretsman-Scully Hall, Princeton, NJ 08544, USA.

Email: sander.vanderlinden@princeton.edu

Perhaps a good place to start is by offering a brief (noncomprehensive) introduction to the study of cultural cognition. The “cultural cognition thesis” is a relatively new approach to science communication (e.g., see Kahan, 2010, 2012, 2015; Kahan, Jenkins-Smith, & Braman, 2011; Kahan et al., 2012). Theoretically, the approach can be seen as a conceptual marriage between the “cultural theory of risk” (Douglas & Wildavsky, 1982) and the psychometric paradigm (Slovic, 2000). Broadly, the theory aims to explain why groups with different “cultural outlooks” tend to disagree about important societal issues. In particular, the cultural cognition thesis argues that public disagreement over key societal risks (e.g., climate change, nuclear power) arises *not* because people fail to understand the science or lack relevant information, but rather as a result of the fact that “people endorse whichever position reinforces their connection to others with whom they share important ties” (Kahan, 2010, p. 296). This latter notion is central to much of the cultural cognition thesis and is generally referred to as a specific form of motivated reasoning, namely, “identity-protective cognition” (Kahan, 2012). Because espousing beliefs that are not congruent with the dominant sentiment in one’s group could threaten one’s position or status within the group, people may be motivated to “protect” their cultural identities. In fact, the cultural cognition thesis *predicts* that identity-protective reasoning is a *mechanism* that people unconsciously employ to assimilate (risk) information. In other words, people are expected to process information in a motivated way, that is, consistent with their cultural worldviews (Kahan, 2012). A key prediction that flows from this theory is that when people are exposed to (new) scientific information, “culturally” biased cognition will merely reinforce existing predispositions and cause groups with opposing values to become even more polarized on the respective issue (Kahan, 2010, 2012).

## What Is “Cultural” About Cultural Cognition?

We need a theory of risk communication that takes full account of the effects of culture on decision-making. (Kahan, 2010, p. 269)

The field of science communication would indeed benefit greatly from more fully taking into account the effects of culture. Unfortunately, social scientists far too often make sweeping claims about human nature based on research that draws primarily on samples from WEIRD (Western, Educated, Industrialized, Rich, and Democratic) populations (Henrich, Heine, & Norenzayan, 2010)—to which cultural cognition is no exception. Yet any approach that examines human cognition by repeatedly sampling from a

single (sub)culture has limited generalizability. Furthermore, we need to think carefully about how we define “culture.” For example, a decent argument can be made that “cultural cognition” does not take full (or much) account of the effects of culture on decision making at all—first and foremost, because it never appropriately defines what is meant by “culture” or at what “level” of culture the theory operates.

Douglas Hofstadter, a prominent cognitive scientist, once wrote a book titled, *I Am a Strange Loop* (Hofstadter, 2007). In the book, the author argues that human consciousness derives meaning only from its self-referential nature (“I” is conceived as part of a self-referential system). The author goes on to explain that a strange loop involves “a series of stages where a shift occurs from one level of abstraction to another and despite one’s sense of departing ever further from one’s origin, one winds up, to one’s shock, exactly where one had started out” (Hofstadter, 2007, pp. 101-102). I borrow the term here to highlight that cultural cognition is exactly this, a strange loop. At various points, the cultural cognition project defines “culture” as pertaining to the shared values of “groups” (e.g., Kahan, 2010, 2015), where “groups” are often further defined as “political affinity groups” (e.g., Kahan, 2012), which are described as “culturally diverse” (e.g., Kahan, 2010). If culture refers to groups and groups refer to a collection of individuals who share a particular political outlook and, in turn, if differences in such political outlooks are ultimately meant to imply variation in culture, then we have just completed a strange loop! I contend that as a thesis, cultural cognition derives meaning primarily from its self-referential nature, where its core theoretical properties (culture, group, political affiliation, etc.) are never exogenously defined. For example, does cultural cognition study differences in culture between individuals or groups—between cultural groups or political affinity groups? Does each group have its own subculture or are all groups part of the same overall culture?

A plausible answer is that the object of study simply refers to “cultural groups” as defined by the “cultural theory of risk” (Douglas, 1970; Douglas & Wildavsky, 1982), which originally proposed a conceptual typology of risk culture where the relative position of four distinct cultural types (egalitarianism, individualism, hierarchism, and fatalism) are determined by the so-called grid-group system or the degree to which individuals feel bounded by feelings of solidarity and belonging (*group*) and the amount of control and structure that people maintain in their societal roles (*grid*). Yet the original formulation of the “cultural theory of risk” suffers from similar circular reasoning fallacies, that is, people of Culture A do X because they share this Culture A that prescribe that they do X (Boholm, 1996). Moreover, cultural worldview scales such as “egalitarianism” and “individualism” are

often used to represent preferences for the role of government (van der Linden, 2015). Although Kahan et al. (2012) argue that their specific operationalization of the scale adds significantly above and beyond political ideology when predicting risk perception, their scale items feature the word *government* over 10 times (e.g., see Kahan, 2012). Thus, if “culture” is defined as a measurable “cultural worldview,” which by and large represents a “political outlook,” then we are once again caught in a strange tautological loop where political ideology is defined as culture and culture as political ideology. Such differentiations are not trivial; the common use of vague, imprecise, and near-tautological reasoning increasingly serves as a “surrogate” for scientific theorizing (Gigerenzer, 2000). To most social scientists, political ideology and culture are two different concepts.

Although there is no universally accepted definition of “culture” (and I certainly do not proclaim to have one), I will draw on commonly accepted definitions in social psychology to illustrate that the cultural cognition approach systematically conflates meaningful differences between the terms *values*, *culture*, and *worldviews*. Values and worldviews are not the same. Worldviews are situation-*invariant* orienting mechanisms (i.e., a lens through which we view the world). Values, on the other hand, precede worldviews (Stern, Dietz, Abel, Guagnano, & Kalof, 1999) and can be seen as situation-*transcending* guiding principles in a person’s life (Rokeach, 1973; Schwartz, 1992). As such, values are more specific and more stable than worldviews (Schwartz & Wolfgang, 1987; Stern et al., 1999). In contrast to the notion of distinct cultural worldviews, people often share and hold a wide range of universal values; it is simply that certain people or groups prioritize the *same* values differently (Schwartz & Sagiv, 1995; Steg & De Groot, 2012). Cultures are generally characterized by their underlying value structures (Hofstede, 2001; Schwartz, 1992). The very reason why egoistic value orientations correlate with individualistic worldviews and pro-social values correlate with egalitarian worldviews is precisely because values precede and are more fundamental than “cultural worldviews,” and, as such, average value priorities are a more natural proxy for shared enculturation (De Groot, Steg, & Poortinga, 2013; van der Linden, 2015).

So why not simply study differences in basic value orientations between people or groups rather than trying to tap into a latent “cultural worldview” that may or may not exist? Indeed, whether or not these cultural prototypes actually exist has been repeatedly called into question (e.g., Boholm, 1996; Price, Walker, & Boschetti, 2014). In fact, cultural theory has been called “simply wrong” (Sjöberg, 1998, p. 150), as cultural worldviews often explain little unique variance in public risk perception (Marris, Langford, & O’Riordan, 1998; Oltedal, Moen, Klempe, & Rundmo, 2004; Sjöberg, 1997,

1998). Furthermore, it can easily be imagined that such worldviews are not distinct when (erroneously) applied to individuals as they might operate more like a personality factor, such that the same person can be part individualist, part egalitarian, part fatalist, and so on.

This brings me to my second argument. To the best of my knowledge, the cultural cognition project has only studied “American” culture. This position appears to be endorsed by its authors, as the *cross-cultural* cognition of societal risk is seen as a different field of study (Kahan, 2012). Yet I argue that this distinction presents a conceptual problem for the approach. This criticism was expressed by Mary Douglas herself as well (Douglas, 2003), as the initial conception of “cultural bias” (Douglas, 1978) was to explain cross-cultural differences, not disagreements between groups within the same culture. Indeed, cultural theory characterizes how certain societies differ in their overarching ways of thinking about the world (Swanson, 2010). For this reason, there is a good argument to be made that a “cultural worldview” is not an innate psychological tendency that can be reliably inferred from individual-level data (Rippl, 2002).

Although it is certainly possible to try to infer cultural dimensions from the aggregation of individual value preferences within a given society, the empirical assessment of systematic differences in cultural worldviews is best conducted between different *countries*, not between *individuals* within the same country, as cultural variation tends to decrease when people from different backgrounds assimilate into the same culture (Oreg & Katz-Gerro, 2006; van der Linden, 2015). This is not to say that the effects of national culture cannot be studied (on the contrary), but national culture should not be conflated with political ideology. In short, cultural cognition is not a thesis about culture per se; rather, the approach seems concerned with “how differences in *individual* values result in *intrasocietal* conflict” (Kahan, 2012, p. 738). Cultural cognition surveys how specific American “groups” with opposing political values construct their understanding and perception of a select number of contemporary science issues.

## **The Limited Role of “Cognition” in Cultural Cognition**

Cognition generally refers to a broad set of mental capacities that are involved in acquiring knowledge, perception, attention, memory, judgment, and decision making. The term *cultural cognition* implies that these basic processes vary *across* cultures (Medin & Bang, 2014). Yet the cognitive “mechanisms” proposed by the “cultural cognition thesis” are U.S.-specific and draw mostly from a narrow class of findings in social psychology, including confirmation bias (Lewicka, 1998), motivated reasoning (Kunda,

1990), value-congruent information processing (Verplanken & Holland, 2002), and motivated in-group information processing (e.g., De Dreu, Nijstad, & van Knippenberg, 2008). Importantly, these concepts were not conceived as part of a novel theory; rather, they were added post hoc to make the connection between two distinct theories (the cultural theory of risk and the psychometric paradigm) a plausible one (Kahan, 2012). For example, what is the difference between "cultural cognition" and "partisan motivated reasoning" (Bolsen, Druckman, & Cook, 2013; Hart & Nisbet, 2012)?

Moreover, although "identity-protective" cognition is certainly a real process (Cohen, Aronson, & Steele, 2000), the extent to which true attitude polarization occurs in response to "mixed evidence" (Lord, Ross, & Lepper, 1979) is vastly overestimated (e.g., see Kuhn & Lao, 1996; Pearson & Schuldt, 2015). For example, consider the prediction that highlighting scientific consensus will only further public disagreement over important science issues (Kahan et al., 2011). A substantial number of studies in the context of climate change have actually shown that communicating the scientific consensus on human-caused climate change does the opposite; it *neutralizes* polarizing worldviews for most people (Cook & Jacobs, 2014; Lewandowsky, Gignac, & Vaughan, 2013; Myers, Maibach, Peters, & Leiserowitz, 2015; van der Linden, Leiserowitz, Feinberg, & Maibach, 2015).

Conservatives and liberals may prioritize their values differently, but this does not mean that they always view one another's values in a negative light (Kerlinger, 1984). Furthermore, categorizing every member of society along a "hierarchical-individualist" or "egalitarian-communitarian" dimension seems unnecessarily restrictive. This is especially true considering the fact that other research has shown that on certain science issues, such as biotechnology and climate change, many different "publics" exist (Priest, 2006). For example, in the context of climate change, at least six different audiences have been identified, each with their own set of beliefs, values, attitudes, and behaviors (Maibach, Leiserowitz, Roser-Renouf, & Mertz, 2011). Note that these audiences are not seen as culturally distinct, but instead, they are generally regarded as different "interpretive communities" within the same culture (Leiserowitz, 2005).

It is entirely plausible that groups on either extreme of the spectrum are motivated to reject scientific information that challenges their deeply held values and beliefs (Roser-Renouf, Stenhouse, Rolfe-Redding, Maibach, & Leiserowitz, 2014). But what about the big middle? Attitude polarization can certainly be "created" by pitting the beliefs of two extremes against each other, but this is unlikely to be an accurate characterization of the public at large. Indeed, recent research has suggested that science polarization may be due to other factors, such as selective exposure to partisan media (Krosnick &

MacInnis, 2015; Nisbet, Cooper, & Garrett, 2015). In fact, complex social phenomena are often multidetermined, and I hope science communication scholars agree that the best available empirical evidence for why the public disagrees over contentious societal issues will most likely come from integrating a range of different approaches and perspectives. If we want to see the whole picture, we will need to collect all the pieces of the science communication puzzle.

## **Conclusion**

In this commentary, I have argued that “cultural cognition” is not a theory about culture nor about cognition per se but rather a thesis about why specific American groups with differing preferences for the role of government in society disagree over a select number of “controversial” science issues. In my view, the thesis suffers from several major conceptual issues. First, it is unclear what the role of “culture” is exactly, at what level (e.g., global, national, or local) it operates, or how it achieves discriminant validity from related concepts (e.g., values). In fact, “cultural cognition” can be characterized as a “strange loop” as it frequently defines its core properties (e.g., culture, group, ideology) in terms of one another. Second, the theory tends to overgeneralize specific findings from psychology and underappreciates less extreme positions held by the many audiences that comprise the so-called general public. The value of cultural cognition could be greatly enhanced by properly defining and differentiating its core components. The thesis would also benefit from examining how “cognitions” of similar societal risks are constructed cross-culturally and from less sweepingly applying social-psychological concepts (e.g., motivated reasoning) across the board. By clearly situating cultural cognition, not in opposition but rather in relation to other approaches, perhaps its true value to the field of science communication will be revealed.

## **Declaration of Conflicting Interests**

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## **Funding**

The author received no financial support for the research, authorship, and/or publication of this article.

## References

- Boholm, Å. (1996). Risk perception and social anthropology: Critique of cultural theory. *Ethnos: Journal of Anthropology*, *61*(1-2), 64-84.
- Bolsen, T., Druckman, J. N., & Cook, F. L. (2013). The influence of partisan motivated reasoning on public opinion. *Political Behavior*, *36*, 235-262.
- Cohen, G. L., Aronson, J., & Steele, C. M. (2000). When beliefs yield to evidence: Reducing biased evaluation by affirming the self. *Personality and Social Psychology Bulletin*, *26*, 1151-1164.
- Cook, J., & Jacobs, P. (2014). Scientists are from Mars, laypeople are from Venus: An evidenced based rationale for communicating the consensus on climate. *Reports of the National Center for Science Education*, *34*(6), 3.1-3.10.
- De Dreu, C. K., Nijstad, B. A., & van Knippenberg, D. (2008). Motivated information processing in group judgment and decision making. *Personality and Social Psychology Review*, *12*(1), 22-49.
- De Groot, J. I. M., Steg, L., & Poortinga, W. (2013). Values, perceived risks and benefits, and acceptability of nuclear energy. *Risk Analysis*, *33*, 307-317.
- Douglas, M. (1970). *Natural symbols: Explorations in cosmology*. London, England: Barrie & Rockliff.
- Douglas, M. (1978). *Cultural bias* (Occasional Paper No. 35). London, England: Royal Anthropological Institute. (Reprinted in: M. Douglas, 1982. *In the active voice* [pp. 183-254]. London, England: Routledge)
- Douglas, M. (2003). Being fair to hierarchists. *University of Pennsylvania Law Review*, *151*, 1349-1370.
- Douglas, M., & Wildavsky, A. B. (1982). Risk and culture: An essay on the selection of technical and environmental dangers. Berkeley: University of California Press.
- Gigerenzer, G. (2000). *Adaptive thinking: Rationality in the real world*. New York, NY: Oxford University Press.
- Hart, P. S., & Nisbet, E. C. (2012). Boomerang effects in science communication: How motivated reasoning and identity cues amplify opinion polarization about climate mitigation policies. *Communication Research*, *39*, 701-723.
- Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences*, *33*(2-3), 61-83.
- Hofstadter, D. R. (2007). *I am a strange loop*. New York, NY: Basic Books.
- Hofstede, G. H. (2001). *Culture's consequences: Comparing values, behaviors, institutions and organizations across nations*. Thousand Oaks, CA: Sage.
- Kahan, D. M. (2010). Fixing the communications failure. *Nature*, *463*, 296-297.
- Kahan, D. M. (2012). Cultural cognition as a conception of the cultural theory of risk. In S. Roeser, R. Hillerbrand, P. Sandin, & M. Peterson (Eds.), *Handbook of risk theory* (pp. 725-759). Amsterdam, Netherlands: Springer.
- Kahan, D. M. (2015). What is the science of science communication? *Journal of Science Communication*, *14*(3), 1-12.
- Kahan, D. M., Jenkins-Smith, H., & Braman, D. (2011). Cultural cognition of scientific consensus. *Journal of Risk Research*, *14*, 147-174.

- Kahan, D. M., Peters, E., Wittlin, M., Slovic, P., Ouellette, L. L., Braman, D., & Mandel, G. (2012). The polarizing impact of science literacy and numeracy on perceived climate change risks. *Nature Climate Change*, 2, 732-735.
- Kerlinger, F. N. (1984). *Liberalism and conservatism: The nature and structure of social attitudes*. Hillsdale, NJ: Lawrence Erlbaum.
- Krosnick, J., & MacInnis, B. (2015). Fox and not-Fox television news impact on opinions on global warming: Selective exposure, not motivated reasoning. In J. P. Forgas, K. Fiedler, & W. D. Crano (Eds.), *Social psychology and politics* (pp. 75-90). New York, NY: Psychology Press.
- Kuhn, D., & Lao, J. (1996). Effects of evidence on attitudes: Is polarization the norm? *Psychological Science*, 7, 115-120.
- Kunda, Z. (1990). The case for motivated reasoning. *Psychological Bulletin*, 108, 480-498.
- Leiserowitz, A. (2005). American risk perceptions: Is climate change dangerous? *Risk Analysis*, 25, 1433-1442.
- Lewandowsky, S., Gignac, G. E., & Vaughan, S. (2013). The pivotal role of perceived scientific consensus in acceptance of science. *Nature Climate Change*, 3, 399-404.
- Lewicka, M. (1998). Confirmation bias: Cognitive error or adaptive strategy of action control? In M. Kofta, G. Weary, & G. Sedek (Eds.), *Personal control in action: Cognitive and motivational mechanisms* (pp. 233-258). New York, NY: Plenum Press.
- Lewin, K. (1951). *Field theory in social science: Selected theoretical papers*. New York, NY: Harper & Row.
- Lord, C. G., Ross, L., & Lepper, M. R. (1979). Biased assimilation and attitude polarization: The effects of prior theories on subsequently considered evidence. *Journal of Personality and Social Psychology*, 37, 2098-2109.
- Maibach, E. W., Leiserowitz, A., Roser-Renouf, C., & Mertz, C. K. (2011). Identifying like-minded audiences for global warming public engagement campaigns: An audience segmentation analysis and tool development. *PLoS One*, 6(3), e17571.
- Marris, C., Langford, I. H., & O'Riordan, T. (1998). A quantitative test of the cultural theory of risk perceptions: Comparison with the psychometric paradigm. *Risk Analysis*, 18, 635-647.
- Medin, D., & Bang, M. (2014). The cultural side of science communication. *Proceedings of the National Academy of Sciences of the United States of America*, 111, 13621-13626.
- Myers, T. A., Maibach, E., Peters, E., & Leiserowitz, A. (2015). Simple messages help set the record straight about scientific agreement on human-caused climate change: The results of two experiments. *PLoS One*, 10(3), e0120985.
- Nisbet, E. C., Cooper, K. E., & Garrett, R. K. (2015). The partisan brain: How dissonant science messages lead conservatives and liberals to (dis)trust science. *The Annals of the American Academy of Political and Social Science*, 658 (1), 36-66.
- Olstedal, S., Moen, B. E., Klempe, H., & Rundmo, T. (2004). *Explaining risk perception: An evaluation of cultural theory* (Rotunde No. 85). Trondheim, Norway: Norwegian University of Science and Technology, Department of Psychology.

- Oreg, S., & Katz-Gerro, T. (2006). Predicting proenvironmental behavior cross-nationally: Values, the theory of planned behavior, and value-belief-norm theory. *Environment and Behavior*, 38, 462-483.
- Pearson, A., & Schuldt, J. (2015). Bridging climate change communication divides: Beyond the partisan gap. *Science Communication*. Advance online publication. doi:10.1177/1075547015611131
- Price, J. C., Walker, I. A., & Boschetti, F. (2014). Measuring cultural values and beliefs about environment to identify their role in climate change responses. *Journal of Environmental Psychology*, 37, 8-20.
- Priest, S. H. (2006). The public opinion climate for gene technologies in Canada and the United States: Competing voices, contrasting frames. *Public Understanding of Science*, 15(1), 55-71.
- Rippl, S. (2002). Cultural theory and risk perception: A proposal for a better measurement. *Journal of Risk Research*, 5, 147-165.
- Rokeach, M. (1973). *The nature of human values*. New York, NY: Free Press.
- Roser-Renouf, C., Stenhouse, N., Rolfe-Redding, J., Maibach, E. W., & Leiserowitz, A. (2014). Engaging diverse audiences with climate change: Message strategies for global warming's six Americas. In A. Hanson & R. Cox (Eds.), *Handbook of environment and communication* (pp. 368-386). New York, NY: Routledge.
- Schwartz, S. H. (1992). Universals in the content and structure of values: Theoretical advances and empirical tests in 20 countries. In M. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 25, pp. 1-65). New York, NY: Academic Press.
- Schwartz, S. H., & Sagiv, L. (1995). Identifying culture-specifics in the content and structure of values. *Journal of Cross-Cultural Psychology*, 26, 92-116.
- Schwartz, S. H., & Wolfgang, B. (1987). Toward a universal psychological structure of human values. *Journal of Personality and Social Psychology*, 53, 550-562.
- Sjöberg, L. (1997). Explaining risk perception: An empirical evaluation of cultural theory. *Risk Decision and Policy*, 2, 113-130.
- Sjöberg, L. (1998). Worldviews, political attitudes and risk perception. *Risk: Health, Safety & Environment*, 137(9), 138-152.
- Slovic, P. E. (2000). *The perception of risk*. London, England: Earthscan.
- Steg, L., & De Groot, J. I. M. (2012). Environmental values. In S. Clayton (Ed.), *The Oxford handbook of environmental and conservation psychology* (pp. 81-92). New York, NY: Oxford University Press.
- Stern, P. C., Dietz, T., Abel, T., Guagnano, G. A., & Kalof, L. (1999). A value belief norm theory of support for social movements: The case of environmental concern. *Human Ecology Review*, 6(8), 1-97.
- Swanson, J. (2010). What would Mary Douglas do? A commentary on Kahan et al., "Cultural cognition and public policy: The case of outpatient commitment laws". *Law and Human Behavior*, 34, 176-185.
- van der Linden, S. (2015). The social-psychological determinants of climate change risk perceptions: Towards a comprehensive model. *Journal of Environmental Psychology*, 41, 112-124.

- van der Linden, S., Leiserowitz, A. A., Feinberg, G. D., & Maibach, E. W. (2015). The scientific consensus on climate change as a gateway belief: Experimental evidence. *PLoS One*, *10*(2), e0118489.
- Verplanken, B., & Holland, R. W. (2002). Motivated decision making: Effects of activation and self-centrality of values on choices and behavior. *Journal of Personality and Social Psychology*, *82*, 434-447.

### **Author Biography**

**Sander van der Linden**, PhD, is a social psychologist based in the Department of Psychology at Princeton University, where he directs the Social and Environmental Decision-Making and Communication lab. He also holds joint positions in the Woodrow Wilson School of Public Affairs and the Andlinger Center for Energy and the Environment and is a research affiliate with the Yale Program on Climate Change Communication at Yale University.