

# When Mother Earth Rises Up

## Anthropomorphizing Nature Reduces Support for Natural Disaster Victims

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**Abstract.** Anthropomorphization is the tendency to ascribe humanlike features and mental states, such as free will and consciousness, to nonhuman beings or inanimate agents. Two studies investigated the consequences of the anthropomorphization of nature on people's willingness to help victims of natural disasters. Study 1 ( $N = 96$ ) showed that the humanization of nature correlated negatively with willingness to help natural disaster victims. Study 2 ( $N = 52$ ) tested for causality, showing that the anthropomorphization of nature reduced participants' intentions to help the victims. Overall, our findings suggest that humanizing nature undermines the tendency to support victims of natural disasters.

**Keywords:** anthropomorphism, nature perception, help intentions

At length did cross an Albatross,  
Thorough the fog it came;  
As if it had been a Christian soul,  
We hailed it in God's name.  
[S. T. Coleridge, 1798]

Anthropomorphization is the tendency to ascribe human characteristics such as reasoning, emotions, and intentions to nonhuman beings or inanimate objects (Epley, Waytz, Akalis, & Cacioppo, 2008; Epley, Waytz, & Cacioppo, 2007; Gray, Gray, & Wegner, 2007; Waytz, Morewedge et al., 2010). Research from different disciplines has long noted that people endorse an anthropomorphic view of animals (Kwan, Gosling, & John, 2008), common objects or machines (e.g., Eyssele & Kuchenbrandt, in press; Kiesler, Powers, Fussell, & Torrey, 2008), divinity (Boyer, 2001), and even of geometric shapes (Heider & Simmel, 1944; Scholl & Tremoulet, 2000). Among different forms of anthropomorphization, the projection of human-like features to nature is a widespread cognitive tendency (Clayton & Opatow, 2003). Our everyday language is imbued with metaphorical expressions such as "mother earth" or "mother nature"; archaic religions and myths personified the awesome forces of nature (Guthrie, 1993), and children tend to hold an animistic view of the physical world (e.g., Piaget, 1972/1926). However, despite its ontogenetic and phylogenetic relevance, the anthropomorphization of nature, has received little attention by empirical research and by experimental psychology (for exceptions, see Norenzayan, Hansen, & Cady, 2008; Waytz, Cacioppo, & Epley, 2010, Study 6). The present work aims at filling this gap by investigating the effects of the anthropomorphization of the

natural world on the perception of the social world in general, and the potential consequences for victims of natural disasters in particular.

Research has revealed that anthropomorphism seems to serve some critical cognitive functions (e.g., Kwan & Fiske, 2008). The crucial causes of anthropomorphism stem from the perceiver's need for understanding. In fact, the ascription of mental states and intentions is the best way to explain events linked to independent agents, given that dispositional factors are seen as stable and easy to control (Heider, 1958). Thus, humanizing nonhuman agents might help people to gain a sense of complex phenomena, perceiving unpredictable behaviors as understandable and anticipating future events (Epley et al., 2007). Despite the lack of empirical studies on the anthropomorphization of nature, the same rationale could be applied to it. As already noted, previous scholars suggested that among the determinants of anthropomorphism stands the need to understand, control, and predict another agent's behavior (Epley et al., 2007). Such effectance motivation (Epley et al., 2008; Waytz, Morewedge et al., 2010; White, 1959) is likely to be particularly relevant when people face natural events, especially when they are negative and lead to dramatic consequences such as natural disasters. Humanizing nature could help the perceiver to conceive natural events as imbued with intentionality and significance rather than considering them merely random and meaningless phenomena (Gray & Wegner, 2010). Consequently, it might help people to rationalize and justify past unpredictable natural disasters and to perceive more control over anticipated future accidents.

Crucial to the purpose of the present study, anthropomorphization also has important psychological and behavioral consequences. As Waytz, Morewedge et al. (2010) stated, “the most fundamental consequence of anthropomorphism is its implication for moral agency” (p. 16). Recent research (Gray et al., 2007; Waytz, Gray, Epley, & Wegner, 2010) demonstrated that ascribing mental states to an entity implies the attribution of the capacity for both feeling (i.e., experience) and acting according to specific purposes (i.e., agency). Consequently, people perceive an intelligent design behind unexplained or accidental events and intentionality and moral responsibility behind humanized agents’ actions (Gray et al., 2007). In the context of natural disasters, the anthropomorphism of nature would imply the perception of natural events as deliberate actions. We contend that the anthropomorphism of nature might affect not only the perception of the agent per se, but also the behavior toward the recipient of the action, i.e., the natural disaster victims.

According to the moral typecasting theory (Gray & Wegner, 2009), moral events are essentially dyadic and require, at least, a doer (a perpetrator) and a feeler (a victim). Therefore, in order to complete the moral dyad, the identification of a moral agent in the context would lead to complementarily typecast a second entity as a moral patient. Following this rationale, one would reasonably expect the perception of nature as agent to accrue the perception of the victim as a moral patient who experiences distress without being responsible for her/his misfortunes. Supporting this hypothesis, previous studies showed that people perceive intentional harm as more distressing than unintentional harm (Gray & Wegner, 2008). Such a reasoning might suggest that the anthropomorphization of nonhuman agents is likely to lead to greater reactions toward the acts of an anthropomorphized agent and the sufferers.

However, as past research showed, the detection of a victim or moral patient in the social context is a necessary, albeit insufficient, condition to motivate intervention and helping behavior in the perceiver who plays the role of a third party in the moral interaction (DeScioli & Kurzban, 2009). For instance, as the just world belief hypothesis posits (Lerner, 1980), people have the pervasive need to believe that the world is a just and predictable place where persons usually get what they deserve. In line with this perspective, previous studies have noted a robust tendency to blame victims for their plight, thus preventing the perceivers from taking action and helping the patients (e.g., Kogut, 2011). Furthermore, according to the classical just world research (Lerner & Miller, 1978), the need to derogate the victim is paradoxically stronger when the victim’s responsibility is far from being obvious, as in the case of natural disaster victims, because the sense of injustice is more challenging.

This effect may be especially likely in the anthropomorphization process when people consider events to be the result of some deliberate and meaningful master plan. Given that the perception of a victim is not a guarantee of pro-

social behavior, we hypothesize that the attribution of intentionality to nature might even reduce the willingness to help victims following a natural event. In fact, conferring responsibility to a nonhuman agent (i.e. nature), for its actions could lead to a moral delegation because it makes it possible to consider the perceived agent as accountable for events that occur (Waytz, Gray et al., 2010; Waytz, Morewedge et al., 2010). Consistent with this hypothesis, perceiving personal responsibility proved to be crucial in inducing offers of help (Rogers, Miller, Mayer, & Duval, 1982) both in adults and in children (Staub, 2003). Although not directly related to anthropomorphism, recent studies on help behavior (Zagefka, Noor, Brown, Randsley de Moura, & Hopthrow, 2011) have also suggested that the perceived causes of natural disasters shape people’s reaction toward victims: People are more willing to help and to donate to disaster victims when the event is perceived as having been caused by natural rather than human factors.

In the present paper, we investigated the relationship between the anthropomorphism of nature and social behavior. We drew from previous conceptualizations and research on anthropomorphism but aimed to extend it in two ways: First, we focused on the neglected process of the humanization of nature; second, we tried to bridge a gap by investigating the unexplored relationship between such a cognitive process and prosocial behavior (for similar reasoning, see Baumeister, Masicampo, & DeWall, 2009). Specifically, we hypothesized that, in the context of a natural disaster, the humanization of nature would decrease people’s willingness to help victims. Our hypothesis was explored across two studies: In the first study, we investigated whether an association between the anthropomorphism of nature and willingness to help victims of natural disasters emerged. To do so, we measured participants’ tendency to anthropomorphize nature and their willingness to help victims of a natural disaster. Upon establishing such a link, in the second experimental study, we tested the effect of nature anthropomorphism on willingness to help victims of natural disasters. Accordingly, we actively manipulated the anthropomorphism of nature to investigate more directly its causal impact on helpfulness. For its salience, media resonance, and recency, in both studies, we used the Japan earthquake (March 2011) as the stimulus and the Japanese earthquake victims as the target group.

## Study 1

### Participants

A total of 96 students at the University of Milano-Bicocca, Italy, participated in this study. The sample consisted of 31 male and 65 female, aged between 18 and 30 ( $M = 22.27$ ;  $SD = 2.45$ ). All participants were Italian citizens.

## Procedure and Materials

Participants were approached in the campus libraries and asked to participate in a study on the social perception of natural events, and those who accepted were given a questionnaire to fill out. First, to assess the anthropomorphism of nature, participants completed a series of four items measuring their tendency to ascribe to nature human mental states such as intention and free will (i.e., “Nature acts according to its intentions”;  $\alpha = .81$ ; see Waytz, Cacioppo et al., 2010). Then, they were presented with a list of 20 emotions, including positive and negative emotions (e.g., fear, pleasure, humiliation, love;  $\alpha = .95$ ). Next, participants were asked to rate the extent to which nature can feel such emotions (Waytz, Cacioppo et al., 2010).

In the second part of the questionnaire, participants were presented with a series of four images showing the effects of the recent earthquake and tsunami in Japan (March 2011). They were asked to look at the images carefully. After observing the images, participants completed a measure assessing willingness to help the victims (i.e., Japanese people) using an eight-item scale (e.g., “The international community must provide financial support for Japanese people”;  $\alpha = .70$ ). Participants provided their responses to all the measures on seven-point scales, ranging from 1 (= *not at all*) to 7 (= *extremely*). Finally, participants’ demographic data (i.e., age, sex, and nationality) were collected. See the Appendix for the complete lists of items.

## Results and Discussion

Consistent with the literature on the link between anthropomorphism and the attribution of emotions to a nonhuman agent (Gray et al., 2007; Waytz, Cacioppo et al., 2010), our scale of anthropomorphism correlated with the ascription of emotions to nature ( $r = .59, p < .001$ ).<sup>1</sup>

More interestingly for our purpose, the results showed that the anthropomorphization of nature and willingness to help were negatively related ( $r = -.21, p = .04$ ) such that high tendencies to humanize nature were associated with less willingness to support victims of the natural disaster. The help intentions were not correlated with emotions ( $r = -.12, p = .23$ ). The complete pattern of correlations is shown in Table 1.

To sum up, Study 1 provided preliminary evidence that anthropomorphism of nature is associated with prosocial behavior. More specifically, supporting the hypothesis of a negative impact of anthropomorphism on helping, we found that the anthropomorphization of nature is negatively related with willingness to help natural disaster victims.

*Table 1.* Means, standard deviations, and correlations for anthropomorphization of nature, attribution of emotions to nature and willingness to help (Study 1)

	Mean	SD	1	2	3
1 Nature anthropomorphization	3.59	1.59	–		
2 Emotions	2.90	1.41	.59**	–	
3 Willingness to help	4.37	0.83	-.21*	-.12	–

*Notes.* Significance levels of correlations are denoted by \*\* $p < .01$ , \* $p < .05$  (two-tailed).  $N = 96$ .

However, emotions and help intentions proved to be uncorrelated. Given that anthropomorphism and mind perception are related to two different dimensions, namely, agency and experience (Gray et al., 2007), our results seem to suggest nature agency (intentionality and responsibility) rather than experience (emotions) to play a crucial role in affecting social behavior. This study, however, did not allow us to test for causality. Thus, Study 2 sought to replicate the findings of Study 1 by manipulating the anthropomorphization of nature.

## Study 2

### Participants

A total of 52 students from the University of Milano-Bicocca, Italy, participated in this study. The sample consisted of 16 male and 36 female, aged between 20 and 30 ( $M = 22.19$ ;  $SD = 2.33$ ). All participants were Italian citizens.

### Procedure and Materials

Participants were approached in the campus libraries. As in Study 1, they were asked to participate in a study on the social perception of natural events, and those who accepted were given a questionnaire to fill out. In the first part of the booklet, participants were presented with the experimental manipulation: Half of the sample was presented with an anthropomorphic image of Mother Earth followed by a brief paragraph that described its positive and negative features in humanized terms (“Mother Earth takes care of Her sons and She satisfies their needs. However, sometimes She suffers, gets angry and rises up”); the other half was presented with an image of the planet Earth followed by a brief paragraph that described some positive and negative characteristics without any reference to humanization (“On the planet Earth, living beings can satisfy their fundamental needs. However, sometimes the planet is place of disasters

<sup>1</sup> It is worth noting that the list of emotions included both primary and secondary emotions, namely, emotions that are considered uniquely human (Demoulin et al., 2004). Due to the very high correlation between the two subsets ( $r = .91, p < .001$ ), the emotion scores were averaged into a global index. Furthermore, in this research, the differentiation of emotions into two distinct categories may be not crucial: Since people generally do not perceive nature as being able to feel, anthropomorphism could be related to the attribution of both primary and secondary emotions.

which strike its inhabitants”). Participants were randomly assigned to one of the two experimental conditions. Then, they were asked to complete a series of five items measuring the tendency to anthropomorphize nature, used here as a manipulation check ( $\alpha = .88$ ). The scale was composed of the four items we used in Study 1 and an additional item to briefly assess the ascription of emotions to nature (i.e., “Nature experiences emotions.”).

In the second part, participants were presented with a series of four images showing the effects of the earthquake in Japan. After observing the images carefully, participants completed a measure assessing their willingness to help the victims ( $\alpha = .71$ ). The items of the scales were identical to those used in Study 1. Participants provided their responses to all the measures on seven-point scales, ranging from 1 (= *not at all*) to 7 (= *extremely*). See appendix for the list of items.

Finally, the participants’ demographic data (i.e., age, gender, and nationality) were collected; they were thanked and released.

## Results and Discussion

To verify our manipulation efficacy, a *t*-test was computed on anthropomorphism comparing the two experimental groups (anthropomorphization vs. control condition). The analysis revealed that participants anthropomorphized nature more in anthropomorphism condition ( $M = 4.61$ ,  $SD = 1.35$ ) than in control condition ( $M = 2.97$ ,  $SD = 1.45$ ),  $t(50) = 4.21$ ,  $p < .001$ ,  $d = 1.17$ . Thus, can conclude that the experimental manipulation of anthropomorphism was successful.

Then, we computed  $\Delta t$ -test comparing the two experimental conditions on the critical dependent variable, i.e., help intentions. In line with Study 1, the results revealed that participants in the anthropomorphism condition were tendentially less willing to help the victims of the natural disaster ( $M = 4.39$ ,  $SD = 1.02$ ) than participants in the control condition ( $M = 4.89$ ,  $SD = 0.87$ ),  $t(50) = -1.91$ ,  $p = .06$ ,  $d = 0.53$ .

Overall, the results of this second study provide more direct support for our hypothesis on the social consequences of the anthropomorphization of nature. In particular, when people are induced to humanize nature, they become less disposed to support victims of natural disasters in facing the misfortune.

## General Discussion

Anthropomorphism is an omnipresent process in our cognitive and social life (see Kwan & Fiske, 2008). The humanization of nonhuman agents is widely acknowledged in mundane circumstances: Witnessing somebody talking with a pet, with God, or with a personal computer, do not

surprise us. Nature is not immune from such a phenomenon. Thus, for instance, we attribute emotions as ire, fury, or serenity to natural and inanimate elements; we describe natural events using “typically human” verbs (e.g., to nourish, to devour); and, not accidentally, we baptize tropical hurricanes with human names (e.g., Andrew, Katrina, Irene). Recent research has provided a psychological account of when and why people are likely to anthropomorphize (Epley et al., 2007, 2008). The present contribution focused on the anthropomorphism of nature and moved attention from causes to the possible social consequences of such a process. More specifically, we hypothesized that the perception of nature as being like a human being can affect one’s willingness to help victims of natural disasters. Our theoretical rationale posits that anthropomorphism of nature is likely to inhibit the willingness to help the victims following a natural event. In fact, the conception of nature as a moral agent could lead to the understanding of natural disasters in terms of meaningful punishments, results of nature’s will and plan, thus fostering moral delegation.

In line with this hypothesis, the results of two studies consistently showed a significant negative relationship between the anthropomorphism of nature and prosocial intentions. More specifically, the results revealed that the more people ascribe humanlike characteristics to nature, the less likely they are to help victims. In particular, Study 2, in which the anthropomorphism of nature was actively manipulated, suggests a causal impact of anthropomorphization on behavioral intentions.

These findings contribute to a first theoretical insight on the possible social consequences of anthropomorphism and, more specifically, of the anthropomorphism of nature. Thus, this line of research could contribute to building a bridge between cognitive aspects of the humanization of nature and its socially relevant effects, such as helping behavior. To our knowledge there is only one previous study on the social consequences of anthropomorphism of nature which shows that the nature humanization leads to environmental concern: People who perceive nature as a human being are more likely to respect it and to use the same social norms of fairness with nature they use in social interactions (Waytz, Cacioppo et al., 2010). With the present contribution, we have tried to show that the anthropomorphism of nature is not only likely to affect the relation with the humanized agent (i.e., nature; for a distinction between consequences for the perceiver and for the perceived, see Waytz, Gray et al., 2010), but also with a third party (i.e., the victims of natural disasters).

Two aspects of the present results are particularly noteworthy. The first one relates to the distinction between “metaphorical,” or weak, and “teleological,” or strong, anthropomorphism (Taber & Watts, 1996). As the present research showed, the anthropomorphism of nature is not merely a metaphor that uses beliefs and emotions to communicate ideas on nature in analogy with human beings. Instead, given the social relevance of its consequences for behavioral intentions, it is likely to be closer to a teleolog-

ical anthropomorphism that allows phenomena to be explained in terms of agency and mental state (Gray et al., 2007).

The second intriguing point is related to the complementarity highlighted by Kwan and Fiske (2008) between anthropomorphism – which means attributing human-like characteristics to nonhumans – and dehumanization, which means denying human characteristics of humans (Waytz, Epley, & Cacioppo, 2010). According to this perspective, the study of social perception cannot be independent from the analysis of nonhuman perception. As our results revealed, helpfulness toward victims of natural disasters decreases when the social perceiver has an anthropomorphic view of nature. Consistent with this, Cuddy, Rock, and Norton (2007) found evidence that, when the victims of the Hurricane Katrina were dehumanized, participants were less likely to volunteer relief. Thus, the humanization of nature – the agent – has the same effects as the dehumanization of the victims.

These preliminary results also raise a number of stimulating questions that might be addressed in further studies. One interesting direction for further research is to clarify the factors that could account for the observed relationship between anthropomorphization and social help. For instance, since moral interactions entail complementary roles (DeScioli & Kurzban, 2009; Gray & Wegner, 2009), viewing a natural disaster in terms of meaningful actions or of punishment driven by intentionality may imply the perception of the victims of natural disasters as wrongdoers. Hence, the question of whether the attribution of responsibility or victims' blame mediate the effects on helping intentions could be explored. Moreover, we believe that the relationship between the anthropomorphism of nature and help intentions could be also significantly moderated by the individual's just world belief (Lerner, 1980). Future studies could introduce direct measures of these theoretical constructs into the procedure.

Another interesting extension of the present work could refer to the valence of the event. Given that negative natural events have important social costs, and that harms are generally related to agency perception because more essential to control (Gray & Wegner, 2010), in the current investigation we considered a natural disaster, namely, the recent earthquake in Japan. Clearly, future studies should explore the effects of the anthropomorphization of nature when natural events are positive rather than negative (e.g., annual Nile flood).

Finally, the current results may also have some relevant practical implications. For instance, when media speak about the "ire" of a hurricane (e.g., "The ire of Irene," 2011, <http://arabnews.com/opinion/editorial/article494423.ece>) or about the "anger" of a volcano (e.g., Shukman, 2010, [http://news.bbc.co.uk/2/hi/uk\\_news/8622745.stm](http://news.bbc.co.uk/2/hi/uk_news/8622745.stm)), they not only lend their description of natural events vividness, but they may also elicit some relevant social perception processes. These social consequences are likely to be even more relevant when the anthropomorphization of nature is

associated with animism and teleology (Gallant, 1981), as in some religious discourses. In this case, nature effectively becomes not only personified, but also the personification of the divinity or the concrete instrument of God's will (e.g., Morewedge & Clear, 2008).

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## References

- Baumeister, R. F., Masicampo, E. J., & DeWall, C. N. (2009). Pro-social benefits of feeling free: Disbelief in free will increases aggression and reduces helpfulness. *Personality and Social Psychology Bulletin*, *35*, 260–268.
- Boyer, P. (2001). *Religion explained: The evolutionary origins of religious thought*. New York: Basic Books.
- Clayton, S., & Opatow, S. (2003). *Identity and the natural environment: The psychological significance of nature*. Cambridge, MA: MIT.
- Cuddy, A. J. C., Rock, M., & Norton, M. I. (2007). Aid in the aftermath of Hurricane Katrina: Inferences of secondary emotions and intergroup helping. *Group Processes and Intergroup Relations*, *10*, 107–118.
- Demoulin, S., Leyens, J. P., Paladino, M. P., Rodriguez, R., Rodriguez, A., & Dovidio, J. F. (2004). Dimensions of "uniquely" and "non uniquely" human emotions. *Cognition and Emotion*, *18*, 71–96.
- DeScioli, P., & Kurzban, R. (2009). Mysteries of morality. *Cognition*, *112*, 281–299.
- Epley, N., Waytz, A., Akalis, S., & Cacioppo, J. T. (2008). When we need a human: Motivational determinants of anthropomorphism. *Social Cognition*, *26*, 143–155.
- Epley, N., Waytz, A., & Cacioppo, J. T. (2007). On seeing human: A three-factor theory of anthropomorphism. *Psychological Review*, *114*, 864–888.
- Eyssel, F., & Kuchenbrandt, D. (in press). Social categorization of social robots: Anthropomorphism as a function of robot group membership. *British Journal of Social Psychology*.
- Gallant, R. A. (1981). Pitfalls of personification. *Science and Children*, *19*, 16–17.
- Gray, H. M., Gray, K., & Wegner, D. M. (2007). Dimensions of mind perception. *Science*, *315*, 619.
- Gray, K., & Wegner, D. M. (2008). The sting of intentional pain. *Psychological Science*, *19*, 1260–1262.
- Gray, K., & Wegner, D. M. (2009). Moral typecasting: Divergent perceptions of moral agents and moral patients. *Journal of Personality and Social Psychology*, *96*, 505–520.
- Gray, K., & Wegner, D. M. (2010). Blaming God for our pain: Human suffering and the divine mind. *Personality and Social Psychology Review*, *14*, 7–16.
- Guthrie, S. (1993). *Faces in the clouds. A new theory of religion*. New York: Oxford University Press.
- Heider, F. (1958). *The psychology of interpersonal relations*. New York: Wiley.

- Heider, F., & Simmel, M. (1944). An experimental study of apparent behavior. *American Journal of Psychology*, *57*, 243–259.
- Kiesler, S., Powers, A., Fussell, S. R., & Torrey, C. (2008). Anthropomorphic interactions with a software agent and a robot. *Social Cognition*, *26*, 168–180.
- Kogut, T. (2011). Someone to blame: When identifying a victim decreases helping. *Journal of Experimental Social Psychology*, *47*, 748–755.
- Kwan, V. S. Y., & Fiske, S. T. (2008). Missing links in social cognition: The continuum from nonhuman agents to dehumanized humans. *Social Cognition*, *26*, 125–128.
- Kwan, V. S. Y., Gosling, S. D., & John, O. P. (2008). Anthropomorphism as a special case of social perception: A cross-species comparative approach and a new empirical paradigm. *Social Cognition*, *26*, 129–142.
- Lerner, M. J. (1980). *The belief in a just world: A fundamental delusion*. New York: Plenum.
- Lerner, M. J., & Miller, D. T. (1978). Just world research and the attribution process: Looking back and ahead. *Psychological Bulletin*, *85*, 1030–1051.
- Morewedge, C. K., & Clear, M. E. (2008). Anthropomorphic God concepts engender moral judgment. *Social Cognition*, *26*, 181–188.
- Norenzayan, A., Hansen, I. G., & Cady, J. (2008). An angry volcano? Reminders of death and anthropomorphizing nature. *Social Cognition*, *26*, 190–219.
- Piaget, J. (1972/1926). *The child's conception of the world*. Towota, NJ: Littlefield Adams.
- Rogers, M., Miller, N., Mayer, F. S., & Duval, S. (1982). Personal responsibility and salience of the request for help: Determinants of the relation between negative affect and helping behavior. *Journal of Personality and Social Psychology*, *43*, 956–970.
- Scholl, B. J., & Tremoulet, P. (2000). Perceptual causality and animacy. *Trends in Cognitive Sciences*, *4*, 299–309.
- Shukman, D. (2010, April). *Icelandic ash: Keeping watch on an angry volcano*. BBC News. Retrieved from [http://news.bbc.co.uk/2/hi/uk\\_news/8622745.stm](http://news.bbc.co.uk/2/hi/uk_news/8622745.stm)
- Staub, E. (2003). *The psychology of good and evil: Why children, adults, and groups help and harm others*. New York, NY: Cambridge University Press.
- Taber, K. S., & Watts, M. (1996). The secret life of the chemical bond: Students' anthropomorphic and animistic references to bonding. *International Journal of Science Education*, *18*, 557–568.
- The ire of Irene. (2011, August 27). *Arab News.com*. Retrieved from <http://arabnews.com/opinion/editorial/article494423.ece>
- Waytz, A., Cacioppo, J. T., & Epley, N. (2010). Who sees human? The stability and importance of individual differences in anthropomorphism. *Perspectives on Psychological Science*, *5*, 219–232.
- Waytz, A., Epley, N., & Cacioppo, J. T. (2010). Social cognition unbound: Insights into anthropomorphism and dehumanization. *Current Directions in Psychological Science*, *19*, 58–62.
- Waytz, A., Gray, K., Epley, N., & Wegner, D. M. (2010). Causes and consequences of mind perception. *Trends in Cognitive Science*, *14*, 383–388.
- Waytz, A., Morewedge, C., Epley, N., Monteleone, G., Gao, J., & Cacioppo, J. T. (2010). Making sense by making sentient: Effectance motivation increases anthropomorphism. *Journal of Personality and Social Psychology*, *99*, 410–435.
- White, R. W. (1959). Motivation reconsidered: The concept of competence. *Psychological Review*, *66*, 297–333.
- Zagefka, H., Noor, M., Brown, R., Randsley de Moura, G., & Hothrow, T. (2011). Donating to disasters victims: Responses to natural and humanly caused events. *European Journal of Social Psychology*, *41*, 353–363.

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## Appendix

Complete list of items used in Study 1 and Study 2 (in Italian in the questionnaire).

### *Anthropomorphization (Study 1 and Study 2)*

- Nature acts according to its own intentions
- Nature is conscious
- Nature has free will
- Nature perceives stimuli
- Nature experiences emotions (only in Study 2)

### *Emotions (Study 1)*

- Confusion
- Love
- Pleasure
- Regret
- Fear
- Veneration
- Happiness
- Vindictiveness
- Anger
- Admiration
- Attraction
- Humiliation
- Sadness
- Tenderness
- Euphoria
- Delusion
- Annoyance
- Optimism
- Excitement
- Resentment

### *Help Intentions (Study 1 and Study 2)*

- The international community must help the Japanese people.
- The Japanese themselves should provide the rebuilding.
- The Japanese people have resources enough to face the crisis autonomously.
- The international community must provide financial support for the Japanese people.
- There are other communities who are in greater need than the Japanese people.
- If I have time and the possibility, I myself would go to help the Japanese people.
- If I have time and the possibility, I myself would promote fundraising in favor of the Japanese people.
- If I have time and the possibility, I myself would make efforts to sensitize public awareness of the Japanese situation.