



Raising awareness of climate change causes? Cross-national evidence for the normalization of societal risk perception of climate change



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ABSTRACT

Increasing the awareness of climate change causes is often considered the key to public support of mitigation and adaptation policies. However, higher awareness might not always relate to higher risk perceptions. Previous research suggests that a process of risk normalization might occur, wherein individuals more exposed and aware of hazards minimize their risk perception to psychologically cope with hazards. This study elaborates on and expands this research, by conducting multilevel analyses on more recent data from the International Social Survey Programme from 33 countries ($N = 46,221$). Results show that in countries with higher carbon dioxide emissions, where people are more exposed to the activities and technologies related to climate change, individuals tend to have lower societal risk perceptions of climate change due to their higher awareness of climate change causes. New insight is provided, as results confirm this effect of risk normalization after controlling for the country socioeconomic context and individual-level covariates (gender, age, education, political orientation, place of living). Of most relevance, results further illustrate that this effect is moderated by the environmental concern of individuals.

1. Introduction

Policymakers are being faced with the challenge of developing both policies to mitigate climate change effects, especially by reducing greenhouse gas emissions, and policies to adapt to the inevitable impacts of climate change. However, mitigation and adaptation to climate change factors will hardly be achieved without public support and engagement. A considerable body of research suggests that risk perception influences public support and public engagement regarding climate change initiatives (e.g., Hagen et al., 2016). Yet the relations between climate change awareness and risk perception are not entirely clear. Higher awareness of climate change might relate to lower risk perception of climate change due to a process of risk normalization. This line of thought, although counterintuitive, is not new. For instance, Norgaard (2011) study of attitudes towards climate change illustrates a disjuncture between the collectively constructed sense of normal everyday life and the troubling knowledge of climate change, arguing that this topic is denied in order to avoid feelings of fear, guilt and helplessness. The objective of this study is to contribute to the understanding of the process of risk normalization, i.e., the psychological process of risk minimization or banalization as a way to deal with a known threat. For this purpose, we will analyse the relation between climate change hazard (indicated by carbon dioxide emissions – CO₂)

and individuals' perception of societal climate change risk (in particular environmental risk), and the mediator role of awareness of climate change causes.

1.1. Risk normalization

Existing literature on risk perception shows that a continued awareness and experience of threatening situations leads to the development of strategies that minimize the perceived risk, as a way to psychologically cope with the threat (Lima, 2004; Lima et al., 2005; Luís et al., 2016; Parkhill et al., 2010). When individuals experience a threat, they tend to cope and eventually become used to its presence, which results in a negative association between the presence and awareness of a hazard and an individual's risk perception. This psychological effect has been coined as *risk perception normalization*. Risk perception normalization is particularly likely to occur when risks have less tangible consequences (Barnett and Breakwell, 2001), as is the case of global environmental problems, which consequences are often perceived as distant in space and time (Schultz et al., 2014; Spence et al., 2012). Therefore, societal risk perception of climate change might be especially prone to this normalization effect. Lima and colleagues (2005) provided some evidence of its occurrence. Analysing archival data from 2000 collected in 25 countries, they showed that indicators of

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technological prevalence (such as CO₂ emissions and chemicals use in farming) were related to lower risk perception, and that this relation was mediated by awareness about different hazards related to those technologies. Higher technological prevalence led to the increase of awareness about environmental hazards likely due to developments in policy and risk management. This increase in awareness then related to a reduction of the perceived risks associated with those technologies (such as climate change and pollution due to chemicals use in farming). Individuals appear to develop psychological risk minimization strategies as a way to minimize perceived threats and psychologically adapt to the situations. However, such strategies do not contribute to solving environmental hazards.

Literature on climate change denial illustrates how the normalization process might occur. Following on Cohen's types of denial (2001), Norgaard (2011) described how people who know about climate change fail to act on that knowledge, i.e., how the psychological, political, or moral implications of that knowledge are not integrated into everyday life or transformed into social action (implicatory denial), suggesting a lack of connect between abstract information of climate change and everyday life. She also described how people might know about climate change but reinterpret that information, for instance thinking climate change is natural, or will not be that bad (interpretative denial). It has also been pointed out the influence of vested-interest groups who have carried-out misinformation campaigns, thereby contributing to deny the climate change science, undermining public understanding of the degree of scientific agreement, and the progress in policymaking (see Oreskes and Conway, 2010). In a recent review, Washington (2017) illustrated that society allows climate change denial to prosper because of a fear of change, failure in worldview, or fixation on the economy.

In this study, we aim to ascertain whether the societal risk normalization effect of climate change still holds, considering the changes that took place during the last decade. Between 2004 and 2013, global CO₂ emissions continued to grow 2.5% per year (Friedlingstein et al., 2014). Public awareness of climate change might also have increased to date. Studies have identified a near-linear relationship between global mean temperature change and cumulative CO₂ emissions (e.g., Matthews et al., 2009), leaving no room for uncertainty on the anthropogenic causes of climate change. In addition, many countries have been discussing and becoming more committed to climate change mitigation (Burck et al., 2015). Also, Lima and colleagues (2005) focused on examining a general model of environmental hazards, environmental awareness, and environmental risk perceptions. This study will focus specifically on climate change. This focus will allow us to draw more valid conclusions, when it comes to the highly-debated issue of climate change.

It should be noted that studies on the relation between knowledge of climate change and risk perception have presented mixed results. Whereas in some studies a negative relation was found (Kellstedt et al., 2008), in others no relation emerged (Brody et al., 2008), and in most studies a positive relation is actually found (O'Connor et al., 1999; Sundblad et al., 2007; van der Linden, 2015). Therefore, it is necessary to test if the negative correlation between awareness and societal risk perception that was previously found also emerges when focusing on climate change causes in particular, and to discuss possible boundaries for this effect that might explain these mixed results.

Moreover, the study by Lima and colleagues (2005) did not control for individual-level variables that might also account for environmental risk normalization effects. Hence, we will conduct a multilevel analysis on recent data, which will allow us to examine the hypothesized country-level effects, while controlling for relevant socio-demographic variables. In particular, we controlled for country-level socioeconomic context, as well as gender, age, education, political orientation, and place of living as variables that could also account for a risk normalization effect. The country's socioeconomic context has not been found to be a reliable predictor of climate change risk perception (Lee et al.,

2015). Nonetheless, its possible effect in risk perception was analysed. Research suggests that gender and political orientation have systematic effects in climate change risk perception. Females tend to have a higher risk perception than males for a wide range of hazards, including climate change (Brody et al., 2008; O'Connor et al., 1999; Sundblad et al., 2007; van der Linden, 2015), and liberals tend to have a higher degree of climate change risk perception than conservatives (Leiserowitz, 2006; van der Linden, 2015). The effects of age and education in climate change risk perception are less consistent. While some studies find evidence for distinctions on the basis of age difference, thus accounting for the fact that younger people have a higher risk perception regarding climate change (Milfont, 2012), others show no relation (Sundblad et al., 2007; van der Linden, 2015). Regarding education, studies have found that a higher education is related to a higher risk perception of climate change (van der Linden, 2015), but that it is also related to a lower risk perception (O'Connor et al., 1999), or that it has no relation to it whatsoever (Milfont, 2012). Place of living (urban vs. rural areas) has not yet been investigated, to our knowledge, but may matter when it comes to risk perception of climate change. Substantially more CO₂ emissions on a per capita level seem to be generated in urban areas (Heinonen and Junnila, 2011), and, therefore, individuals living there likely have a higher risk perception. Furthermore, most studies have been conducted in industrialised western countries; as such, it is important to explore whether these results can be generalized to other countries.

In addition, no study has ever tested any boundary conditions of climate change risk normalization effects. In this study, we will examine whether it depends on individuals' environmental concerns.

1.2. The effect of environmental concern on risk normalization

When examining environmental risk normalization of climate change, the question also arises whether this effect occurs for all people equally or whether there are variables that mitigate its occurrence. A candidate for this role might be environmental concern. Environmental concern can be defined as a general attitude towards the environment, which has positive effects on the perception and evaluation of environmental-related cognitions and on pro-environmental behaviour (Bamberg, 2003). Franzen and Vogl (2013) suggest that it gathers a cognitive component (having rational insight into the problem), an affective component (being emotionally affected by environmental degradation), and a conative component (being willing to act). Recent research found evidence across six culturally and politically diverse countries that higher levels of knowledge about the causes of climate change were related to a heightened concern about climate change (Shi et al., 2016). Therefore, it might be the case that when individuals are high in environmental concern they use ideologically motivated reasoning to process information on climate change. Ideologically motivated reasoning (Kahan, 2013) is a form of information processing that rationally promotes individuals' interests in forming and maintaining beliefs that have relevance for one's identity, such as environmental concern might have. Ideological motivated reasoning might justify that individuals high in environmental concern continue thinking, feeling or acting on climate change as a threat and do not minimize their risk perception.

In sum, the goals of this work are 1) to test whether there is a normalization effect, that is a negative relation between the countries climate change hazard (indicated by CO₂ emissions, and perceived by the individuals through the activities and technologies related to climate change) and the individual's climate change risk perceptions that is mediated by the individual's higher climate change awareness, using multilevel analyses; 2) to explore if the normalization effect can be explained by socio-demographic variables; 3) to test whether the normalization effect is still found when the individuals are highly environmentally concerned.

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