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Intention to change activities that reduce carbon dioxide emissions related to worry about global climate change consequences

Inquiétude à propos du changement climatique et intention de changer ses habitudes de consommation génératrice de CO₂

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ABSTRACT

Introduction. – Mitigating the global climate change requires actions at different levels including that lay people change their consumption patterns, which cause emissions of greenhouse gases. Recent research suggests that inducing affects such as fear and worry may have positive effects.

Objective. – To investigate whether worry in addition to personalized information about emissions of carbon dioxide would influence lay people's intentions to change consumption-related personal activities causing carbon-dioxide emissions.

Method. – A municipality-provided tool to calculate their annual carbon dioxide emissions was used by 135 university students who after being informed about negative consequences of global climate change stated their intentions to change a number of personal activities to reduce carbon dioxide emissions during the following 12 months. They also rated how worried they were about eight global climate change consequences.

Results. – Intentions to change travel, energy use at home, food consumption, involvement in environmental organizations, and support of environmental policies increased with worry. An interaction was also observed such that high-emitters' intentions to invest in energy-efficient infrastructure increased more with worry than did low- and medium-emitters' intentions.

Conclusions. – In line with recent research positing that affect increases preventive actions, the hypothesis was supported that intentions to change personal activities to reduce carbon dioxide emissions increased with participants' worry about the consequences of global climate change.

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R É S U M É

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Atténuer le changement climatique exige des actions à différents niveaux, y compris que les gens changent leurs habitudes de consommation à même de provoquer des émissions de gaz à effet de serre. Des recherches récentes suggèrent que l'induction d'émotions telles que la peur et l'inquiétude peut avoir des effets positifs. Une étude a été réalisée afin de déterminer si le sentiment d'inquiétude couplé à un bilan individuel des émissions de dioxyde de carbone (CO₂) pourrait être en mesure d'encourager les gens à changer leurs activités liées à la consommation personnelle à l'origine de ces émissions. Cent trente-cinq étudiants se sont vus fournir par leur municipalité un outil permettant de calculer leurs émissions annuelles de dioxyde de carbone. Après avoir été informés des conséquences négatives du changement climatique, ces derniers ont confirmé vouloir changer un certain nombre d'activités personnelles afin de réduire leurs émissions de dioxyde de carbone au cours des 12 mois suivants. Ils ont également évalué et hiérarchisé leurs inquiétudes concernant huit conséquences différentes du changement climatique. Les résultats montrent que la volonté de changer ses habitudes de déplacement, de consommation d'énergie à la maison, de consommation alimentaire, de participation aux organisations environnementales, ou encore de soutien aux politiques environnementales augmentent avec le sentiment d'inquiétude. Par ailleurs, les résultats observés démontrent qu'un individu générant une forte dose de gaz à effet de serre sera plus sensible au sentiment d'inquiétude qu'un individu générant une faible ou moyenne quantité, et sera donc plus à même d'investir dans des infrastructures « vertes ». Ainsi, dans

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la continuité de recherches récentes postulant que la sensibilisation augmente les actions de prévention, nous avons montré que l'intention de changer un mode de comportement personnel en vue de réduire ses émissions de dioxyde de carbone augmente avec le sentiment d'inquiétude des participants vis-à-vis des conséquences du changement climatique.

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1. Introduction

According to the Intergovernmental Panel of Climate Change (IPCC, 2007), immediate powerful actions are needed to mitigate the global climate change (GCC). Future damaging consequences for the ecosystems will in different ways threaten human environments. GCC is claimed to be caused by increasing levels of greenhouse gases, primarily in the industrialised countries due to population growth and the Western lifestyle. Carbon dioxide (CO₂) is emitted by burning fossil fuels for transport and heating. Methane is emitted by the cattle raised by a growing meat industry.

The European Union (EU) has decided that emissions of greenhouse gases should be reduced by at least 20% until 2020 compared to the 1990 level. Further steps has also been taken for transforming EU into a competitive low carbon economy with a cut by 80–95% in greenhouse gas emissions by 2050 compared with 1990 levels (European Commission, 2011).

Journalists, politicians, and lay people having knowledge of GCC (Sundblad et al., 2009) undertake different actions. Journalists attend to the issue and disseminate information. Politicians implement regulation to reduce greenhouse gas emissions, as exemplified by the current carbon trading system in EU, and they provide subsidies for the development of alternative energy sources (e.g. wind power). Lay people may reflect over their own emissions and consider what changes in consumption-related personal activities they should make. They may also demand or support political action.

If information is provided so that lay people themselves are able to calculate their CO₂ emissions, it may possibly both increases their motivation to make changes in their daily lives and inform them about which types of activities they should change. This may also lead to commitment to make the changes (Witte & Allen, 2000; Joule et al., 2007). Yet, information about own emissions would be unlikely to have any effect unless one believe in and is worried about negative consequences.

Another important factor that may affect lay people's intentions to change consumption is their perceived risk of the future GCC consequences. Risk is usually objectively defined as the probability of negative consequences, whereas an emotionally toned worry also plays a decisive role for lay people's perception of risk (Slovic, 1987, 2001). In a similar vein Finucane et al. (2000) proposed the "affect heuristic." Affect is both an emotional state that people experience as well as a quality of goodness or badness associated with objects. Unpleasant affective reactions such as worry may motivate actions and thoughts that are anticipated to eliminate the affect. The role of worry as an anticipatory emotion is posited by the "risk-as-feelings" hypothesis (Loewenstein et al., 2001). According to this hypothesis, both cognitive risk assessments and anticipatory emotions are antecedents of intentions to reduce risk.

Anticipatory consequence-related emotions such as worry may motivate lay people to attempt to prevent GCC consequences. In this vein, some limited previous research has shown that risk perception or worry is related to changes in consumption to reduce CO₂ emissions or support for political action (O'Connor et al., 1999).

The aim of the present research is to investigate the extent to which people's intention to change consumption-related personal activities depends on their worry about GCC consequences. In order to find such a relationship, worry may need to be activated by

some external event, such as a heat wave, or newspapers coverage informing people about negative GCC consequences. Lay people may still not think that they need to make any changes unless they know how much they themselves contribute to the CO₂ emissions. In the study to be reported below, the participants were informed about GCC consequences in the way they would be in newspapers, and they were requested to calculate their own CO₂ emissions.

Spangenberg and Lorek (2002) identified 10 clusters of household consumption activities that were both environmentally relevant and controllable by consumers. Of these clusters, housing, food consumption, and travel had the largest effect on CO₂ emissions. In the present study we select activities that cover these clusters (empirically resulting in four clusters). In addition, we include activities that express "environmental citizenship" (Stern et al., 1999) such as joining environmental organizations and supporting environmental policies.

In summarizing, we hypothesize that people will form intentions to change activities that reduce CO₂ emissions depending on how much they are worried about GCC consequences. This hypothesis is tested by letting participants first calculate their CO₂ emissions using a tool provided by the municipality where they live, then after being informed about GCC consequences requiring them to answer questions concerning their intentions to change a number of consumption-related personal activities that emit CO₂, and finally to rate how worried they are about eight GCC consequences.

2. Method

2.1. Participants

One hundred and thirty-five undergraduates (88 females, mean age 32 years) at the University of Gothenburg, Göteborg, Sweden participated in compensation for a free cinema ticket. They were recruited from a database of volunteers and were invited to come to the laboratory individually or in small groups. Minimum age was set to 24 years to increase the likelihood that the participants were responsible for their own economy.

2.2. Procedure

In the laboratory participants were met by a research assistant that seated them in isolated cubicles in front of computers. When several participants arrived at the same time, any interaction between them was prevented.

When seated the participants were asked to complete a computer-aided calculation of their own current CO₂ emissions. The computer program was set up by the environmental committee of the municipality of Göteborg, Sweden and is available as an Internet service to local citizens (www.goteborg.klimatkontot.se/Default.aspx). An in-house version of the program was used. It calculated an approximate annual CO₂ emission for the participants, expressed in kilograms of CO₂, based on their reported housing conditions, food consumption, type and use of white goods, habits of recycling as well as mode and length of travel to work, during work and during leisure time. The calculations took approximately 15 minutes. The results were then printed out and shown to the participants.

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