

# Youth, climate, and change: Exploring responses, well-being, and pro-environmental behavior

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## **Integrative Statement:**

The studies in this symposium explore adolescents and young adults' diverse responses to climate change, the impact of climate change on their mental well-being, and ways to measure and foster their pro-environmental behavior. The first study identifies different profiles of adolescents' climate change distress and denial, highlighting the dynamic nature of these responses. The second study emphasizes pro-environmental behavior as an extension of prosocial behavior, by applying the model of helping behavior to the ecological domain. The third study reports on the efficacy of a novel approach to promoting adolescents' pro-environmental behavior. The fourth study focuses on the psychological benefits of nature connectedness for adolescents, particularly in terms of well-being and mental health. The fifth study presents a tool to holistically measure sustainability competencies especially designed to assess the outcome of education for sustainable development (ESD) including knowledge, motivation and behavior for different age groups.

**Keywords:** *pro-environmental behavior, nature connectedness, climate distress, sustainability competence, motive-alignment*

## **1. Unveiling the many faces of adolescents' climate change distress and denial: A three-year, two-cohort longitudinal profile study**

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Although climate change is a pressing threat, adolescents respond to it in diverse ways. While some may experience distress caused by the awareness of climate change, others may even deny its existence. This study takes a person-centered approach, using longitudinal data collected annually from 2020-2022 to explore the nuances of climate change distress and denial among adolescents. The aim is to identify distinct profiles of climate change distress and denialism and to assess the stability of them. The profiles' explanatory similarity on general well-being and pro-environmental behavior is also examined. Looking at two age cohorts born in 2008 and 2006 ( $N = 1915$ ), four profiles were identified. The normative carefree group (Time 1: 51%, Time 2: 53%, Time 3: 55%) had low climate change distress and denial.

Another group called denialists (19%, 17%, 15%) had low distress but elevated denial. The emotionally engaged group (23%, 21%, 20%) had elevated climate change-related emotional distress and low climate denial. They were the most engaged in pro-environmental behavior. The final group, the overburdened (8%, 9%, 9%), reported both high climate change distress and elevated denial, and group membership was associated with low well-being. The transition patterns showed that the profiles were unstable across three measurement points. Additionally, distinct transition patterns emerged for the age cohorts, underscoring age-related differences in the development of these phenomena. The results suggest that climate change distress among adolescents is not a static phenomenon. Rather, it is constantly evolving. The results also show that climate change distress and climate denial can coexist among adolescents.

**Keywords:** *Climate change distress, climate denial, well-being, pro-environmental behavior*

## **2. Green guardians: Pro-environmental behavior as a special case of helping behavior in adolescents and young adults**

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Climate change poses one of the gravest challenges. Thus, understanding the behavioral motivations of pro-environmental behavior, especially among adolescents and young adults, is crucial. This study frames pro-environmental behavior as a specialized form of prosocial behavior where the primary motivation is the well-being of the entire planet and its inhabitants rather than merely fellow humans. As such, the processes described in the model of helping behavior (Latane & Darley, 1970) has been applied to the ecological domain and empirically tested. Conducted with  $N = 290$  participants (68% female; age range 15 - 25), the item-response-theory based study indicates that noticing the climate crisis, interpreting it as an emergency, feeling personally responsible to act and internal efficacy all act as significant predictors for general pro-environmental behavior (i.e., across dimensions, such as consumption, diet, mobility, energy use, resource management, media consumption, and waste reduction). Further it was shown that the engagement in general pro-environmental behavior increases as age increases. These results not only underscore the effectiveness of the model of helping behavior in predicting pro-environmental behavior, but critically helps to reframe pro-environmental behavior as an extension of prosociality, classically understood as human-to-human behavior.

**Keywords:** *prosocial behavior, pro-environmental behavior, item-response-theory, model of helping behavior*

### **3. Promoting adolescents' sustainable behavior via motive-alignment: A field experiment**

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Adolescents are well positioned to catalyze sustainable behavior change in society. And yet, their day to day behaviors tend not to reflect their concern about climate change. In this longitudinal field experiment, we aimed to promote adolescents' pro-environmental behavior using a "motive-alignment" approach. This approach posits that adolescents can be motivated to engage in sustainable behavior by aligning such behavior with their developmentally salient motives for autonomy and peer status. Dutch adolescents ( $N = 474$ ) were randomly assigned to either a motive-alignment (treatment) or educational (active control) environmental intervention. The interventions consisted of a reading and writing activity. The motive-alignment intervention increased adolescents' pro-environmental behavior at a food-stand ( $PMP_c = 88.5\%$ , Bayes Factor = 7.70), where they could choose among snack options with more or less favorable eco-labels. This research informs the development of affordable and scalable interventions to help adolescents act on their environmental concerns in their daily lives.

*Keywords: adolescence, pro-environmental behavior, sustainability motive-alignment*

### **4. Understanding the importance for adolescents and emerging adults to 'notice nature': Benefits for well-being and mental health**

Watling, D. <sup>\*1</sup>, Lecourtois, L. <sup>2</sup>, Levent, A. <sup>1</sup>, Jeffries, R. <sup>1</sup> & Bellamy, A. <sup>1</sup>

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With adolescence being a period when mental health conditions are most frequently diagnosed, it is important to understand findings for links between nature, well-being, and mental health and what impact spending time in nature may for adolescents, who during this time are less prone to engage with nature and feel less connected to nature. In this talk, two studies completed in collaboration with Kew Royal Botanical Gardens at their Wakehurst site will be discussed that explore the impact of spending time in nature on well-being. Study 1 ( $N = 599$  seven to 12-year-olds) explores changes in feelings of nature connectedness and well-being before and after having a 'noticing nature' experience at Wakehurst in one of three biodiverse landscapes. Findings indicate early adolescents' feelings of nature connectedness are lower than younger children in the study, and that those who were initially low on nature connectedness following the nature walk showed the greatest improvement in nature

connectedness, with these benefits associated with positive well-being changes. Study 2 ( $N = 313$  eighteen – 87-year-olds, with 39 being 18-30 years old) explores the association between nature connectedness, mood, well-being, stress (heart rate as proxy measure) and feelings of restoration, following a self-directed nature 45-minute walk, with a 10-minute rest to ‘notice nature’. Findings were consistent with expectations of nature benefits, in particular that being younger predicted greater sense of restoration. Findings will be discussed with regards to the converging evidence of the benefits for adolescents to spend time in nature.

**Keywords:** *nature engagement, nature connectedness, well-being*

## **5. Sustainability competence? A test of the outcome of education for sustainable development from child- to adulthood**

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An important goal of education for sustainable development (ESD) is to promote the ability to act sustainably. However, the question arises as to which competencies enable people and which actually drive sustainable behavior. We developed an approach to capture sustainability competence as a holistic outcome of ESD consisting of the three facets knowledge, motivation and action that is also linked to the 17 Sustainable Development Goals (SDGs) by sorting them into individually relevant domains of action. One of the central domains of action is "Mobility and Consumption." For this domain we developed a large item pool which we pilot tested and optimized based on Item-Response-Theory (IRT). The resulting 443 items were further tested online with three different age cohorts (ranging from grade 3 to 13) and an additional sample of young adults. Preliminary reliabilities for the different cohorts and the three facets of competency ranged from .61 to .84. We have developed a reliable holistic outcome measure of sustainability competency with the three facets knowledge, motivation, and action for different age groups based on IRT. Through the large number of items and the use of IRT, adaptive testing can be applied. This might be used to increase reliability or reduce test lengths. Furthermore, because of items that can be applied throughout several cohorts, longitudinal testing of from the age of about 8 years through adulthood is possible based on IRT.

**Keywords:** sustainability competence, item response theory, assessment