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Measurement Development and Validation to Capture Perceptions of Younger People's Climate Action: An Opportunity for Intergenerational Collaboration and Dialogue

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ABSTRACT

Climate change impacts are characterized by their differential treatment of diverse age groups and generations. Although both the old and the young are particularly vulnerable to climate change, it is the younger and unborn generations that will suffer the longest. Consequently, the youth are perceived as leaders of the climate movement. This study developed and evaluated a measure to assess the perceived role of younger people in climate action. The measure consists of three items that assess the perceived role of younger people as positive, and two items that assess their perceived role as a nuisance. The measure demonstrated adequate reliability and validity. The findings highlight the presence of both positive and negative perceptions of younger people in the context of climate change. This information can be used to address generational barriers and facilitate intergenerational solidarity toward a healthy climate.

KEYWORDS

Climate change; environment; global warming; measurement development; psychometrics; youth movement; intergenerational tension; intergenerational solidarity

The changing climate is one of the most challenging situations facing humanity in current times. According to the Intergovernmental Panel on Climate Change (IPCC), the climate crisis is largely human made, a result of greenhouse gas emissions, which reflect the carbon footprint of humanity. With changing climate, we should expect more extreme and severe weather events, droughts, floodings, and a rise in sea level. These changes are also expected to result in reduced biodiversity (Intergovernmental Panel on Climate Change, 2022).

For humans, these changes are life threatening and reflect a violation of human rights because they affect our ability to access food, water, clean air, and shelter (Kruger et al., 2014). Climate change has been associated with increased mortality and morbidity (Åström et al., 2011). It also has a substantial detrimental impact on people's wellbeing and mental health (Cianconi et al., 2020). The effects of climate change, however, are not

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distributed equally. It is poorer countries and people, indigenous people, ethnic minorities, and those most dependent on land and natural resources, who are most likely to be affected by climate change (Hallegatte et al., 2018; Kim et al., 2012; Ritchie, 2021). Moreover, these people have contributed the least to climate change and have had the fewest opportunities to benefit from the modernization processes that have led to the changing climate. Women, as well, are more likely to be impacted by climate change, but are also less likely to have political power to influence climate policy (Nyahunda et al., 2021; World Health Organisation, 2014). Nonetheless, in several studies, women have been shown to be more concerned about environmental issues compared to men (McCright, 2010).

Climate change also has a temporal component, given its varying impacts on people of different age groups and generations over the life course (Gray et al., 2019; Thiery et al., 2021). Both children and older people are considered vulnerable to the impacts of climate change (Adams et al., 2021; Ayalon, Keating, et al., 2021; Sheffield & Landrigan, 2011). There is plenty of research to show that older people are more likely to die during evacuation associated with severe climate events and more likely to develop varied medical conditions, including cardiovascular diseases, stroke, and even dementia due to environmental threats, such as heat waves or air pollution (Kenney et al., 2014; Peters et al., 2019). Children as well are thought to be disproportionately affected by climate change. Given the fact that the changing climate is expected to result in worse weather conditions over time, young people today, as well as those not yet born, will be the ones to experience the worst effects of the changing climate for the longest period (Diprose et al., 2019; Gardiner, 2006).

Given the differential impact of the changing climate on people of different age groups and cohorts, a public discourse concerning the role of older people in the current climate situation has emerged (Han & Ahn, 2020). Younger activists have become the face of the climate change movement, urging world leaders to act now for a better future. Although this discourse attests to the commitment and engagement of younger generations to address climate change, it is also characterized by prominent ageist features (Ayalon et al., 2022; Han & Ahn, 2020). This includes a tendency to blame adults for failing to act on time to stop the warming of the atmosphere due to greenhouse gas emission. Older people especially are seen as the ones who have refrained from addressing the climate crisis despite having political power to influence policy (Boulianne et al., 2020). Younger people, in contrast, are perceived as having no political power; their voice is neither heard nor represented in an issue that affects them disproportionately (Thew et al., 2020). Moreover, just as prosperous countries are being held responsible for historical emissions during and following the industrial revolution, so are older people being blamed for benefiting from the damage that they have inflicted on the environment

for many decades. However, this assessment tends to ignore the responsibility of national and international policies as well as corporate interests around the globe (Allen & Craig, 2016; Mees et al., 2019).

Ageism is not a unidirectional construct, directed solely toward older people. Younger people as well are thought to be victims of ageism directed toward them by those holding positions of power in society (de la Fuente-Núñez et al., 2021). Depriving younger people of political power, especially on issues related to their future, can be considered ageist. Moreover, younger people involved in climate action and representing the climate change movement often experience ageist attitudes which belittle their efforts and view their concerns as either irrelevant or overhyped. For instance, a study examining German newspapers' coverage of the Fridays for Future movement has identified attempts to delegitimize the movement through the use of ageist, belittling language (Bergmann & Ossewaarde, 2020). The authors concluded that the newspapers convey conservatism and skepticism toward the youth-led climate movement, using paternalistic discourse. Similarly, another study conducted in Australia found that media-fueled characterizations of youth climate activists portrayed them as "ignorant zealots," "anxious pawns," "rebellious truants," and "extraordinary heroes" (Mayes & Hartup, 2021).

Despite incidents of ageism, directed both toward older and younger members of society, there also is a growing understanding that the changing climate should be addressed through intergenerational solidarity (Ayalon et al., 2022; Yarrow, 2009; Zhang, 2018). Both younger and older people are vulnerable to climate change; both are negatively affected by climate change; and both are exposed to ageist attitudes and behaviors, which further heighten their vulnerabilities. Considering the role that ageism, accompanied by intergenerational tension, plays in current climate discourse, and the limited attention given to the topic of ageism toward younger people in general, and in the context of climate change in particular (Ayalon, Keating, et al., 2021; Bergmann & Ossewaarde, 2020; de la Fuente-Núñez et al., 2021), this study aimed to develop and validate a new measure which examines the perceived role of younger people in climate concerns and related action. This measure was specifically designed to capture both positive and negative perspectives concerning younger people's involvement in climate action. Together with an existing measure on the perceived role of older people in climate change, this tool can provide a comprehensive account of intergenerational tension and ageism in the context of climate change. This information is essential for the understanding of possible barriers to and facilitators of intergenerational solidarity among younger and older members of society, especially around crucial issues such as the changing climate.

Convergent and divergent validity was examined in line with the following hypotheses:

- Older age was expected to be positively correlated with negative attitudes about younger (under the age of 18) people's involvement in climate action and negatively correlated with positive attitudes about their involvement. This expectation was formed in line with research that suggests that age can serve as a dividing variable between groups (de la Fuente-Núñez et al., 2021; Hagestad & Uhlenberg, 2005).
- Although ageism also can be directed toward one's own age group (Ayalon & Tesch-Römer, 2018; Levy, 2009), we did not expect younger people to hold more negative attitudes about their involvement in climate action.
- Men were expected to be more negative toward younger people's involvement and women were expected to report more positive attitudes concerning younger people's involvement. This hypothesis was formed in line with research showing that (older, White) men are more likely to be climate deniers and oppose the climate movement (Ballew et al., 2020). Women, on the other hand, are more likely to support the climate movement and to express concerns about climate change (Mavisakalyan & Tarverdi, 2019; McCright, 2010).
- The relationship between education and attitudes toward the role of younger people in climate action was examined as a research question, with no clear hypotheses about the relationship due to the fact that educational attainment does not show a direct effect, but instead interacts with political ideology in the context of climate change (Ballew et al., 2020; Czarnek et al., 2021).
- We expected positive attitudes toward older people's involvement in climate action to be correlated with positive attitudes toward younger people's involvement. This hypothesis was inspired by the notion of intergenerational solidarity in the context of climate change. It is also supported given the expectations that the two sets of attitudes largely represent a concern for the changing climate.
- Negative attitudes toward older people's involvement in the context of climate change were expected to correlate positively with positive perceptions concerning the contributing of younger people to climate action and negatively with negative perceptions concerning the contributing of younger people to climate action. This stems from the polarizing discourse around climate change, which pits generations against each other (Ayalon, Chasteen, et al., 2021).
- We also expected perceptions concerning the positive contribution of younger people to climate action to be positively correlated with the belief that climate change is real and with greater willingness to pay taxes to fight climate change. Perceptions concerning younger people as a nuisance in climate action were expected to be negatively associated with the belief that climate change is real and with greater willingness to

pay taxes to fight climate change. This hypothesis was formed in light of the strong association between youth and the climate change movement, and with the youth being seen as the leaders of the movement (Han & Ahn, 2020).

Methods

Study context

The present study was conducted in Australia, a country that has experienced increasingly severe weather conditions, accompanied by recent bushfire disasters in its Southeast region (Abram et al., 2021) and an overall reduction in its biodiversity (Green & Pickering, 2019). Despite extreme climate experiences and growing public support for climate action, politically, Australia's climate policy is perceived as lagging (Colvin et al., 2021), although the new government is making efforts to match the rest of the developed world in setting climate goals. Nevertheless, younger Australians and women appear more concerned about the current climate situation and more willing to act to impact change (Tranter, 2011).

The sample and procedure

In total, 250 people completed the survey via an online survey company. Respondents were Australian residents over the age of 18. All respondents signed an informed consent prior to participating in the study. The average age of participants was 46.20 (SD = 18.68) and 118(46.8%) were men. Most of the sample had undergraduate education level 115(45.6%).

Measures

Perceptions of younger people's climate action

This measure was developed based on a) interviews with climate activists (Roy & Ayalon, *in press*), b) a review of communications produced by climate activists in the media (Roy & Ayalon, *in press*), and c) a scoping review on intergenerational relations in the context of climate change (Ayalon et al., 2022). The original pool of items consisted of 9 possible statements addressing both positive and negative aspects associated with younger people's (under the age of 18) involvement in climate action. Respondents were asked to rank the items on a 7-point scale (Completely Agree-Completely Disagree).

Demographic information

Age, gender, and educational attainment data were gathered based on respondents' self-report.

Perceptions of older people's climate action

The scale includes two subscales, covering older people's perceived negative contribution to climate change effects and adaptation and mitigation measures (5 items; "Older people have too much voting power on issues like climate change") and perceived positive contribution to adaptation and mitigation measures (3 items; "Older people can be powerful allies in the fight against climate change"). The measure has demonstrated adequate validity and reliability, with Cronbach's alphas in this study of .89 and .61, respectively.

Attitudes toward climate change

Two items were selected to represent attitudes toward climate change: "climate change is a real phenomenon" and "I am willing to pay higher taxes to fight against climate change." Items were ranked on a 1–7 scale, with a higher score indicating greater agreement.

Analysis

Using SPSS version 27 (IBM, 2017), we conducted descriptive analysis examining item characteristics including floor and ceiling effects. Next, we conducted exploratory factor analysis using maximum likelihood analysis, with varimax rotation. Double-loading items and those of loading lower than .4 on their respective factors were eliminated. We also calculated the internal consistencies of the final subscales. Finally, we examined convergent and discriminant validity to test the hypotheses listed above.

Results

Table 1 describes the item characteristics. Responses on the items ranged between 1 and 7, with a higher score representing greater agreement. Relying on $\geq 20\%$ of the responses endorsing option 1 or 7 (e.g., a high proportion of participants have a minimum or a maximum score, respectively), as an indicator of floor or ceiling effects, one item had a ceiling effect ("Younger people should be allowed to vote on climate policy"). This item was excluded from further analysis.

We eliminated items that double loaded on both factors and those that had loading lower than .4. A two-factor solution explained 54.27% of the variance. The factor analysis yielded two distinct factors, representing perceptions concerning younger people's positive contribution to climate action and younger people's contribution to climate action as a nuisance. The first factor

Table 1. Mean, standard deviations, and floor and ceiling effects of the items^a (*N* = 250).

Items	Mean (SD)	% Floor	% Ceiling
Climate change affects young people (under 18) more than older people (over 60)	4.49(1.69)	6.4	13.6
Younger people are more concerned about climate change than older people	4.98(1.59)	3.2	18.8
Younger people contribute more to the climate movement than older people	4.72(1.39)	2.8	13.6
Younger people have inherited the burden of climate change from older people	4.80(1.76)	6.8	19.2
Younger people are leading the fight against climate change	4.89(1.33)	2.0	12.8
Younger people should be allowed to vote on climate policy	4.98(1.64)	4.4	22.0
Younger people are being used as pawns by political parties in the climate movement	4.46(1.57)	4.8	11.2
Younger people would do better to focus on school rather than climate policy	4.16(1.77)	10.0	9.6
Younger people are overly dramatic in their concerns about climate change	3.84(1.91)	15.6	10.4

^aItems are ranked on a 1–7 scale with a higher score indicating greater agreement.

was composed of three items representing perceptions concerning younger people’s positive contribution to climate action: “younger people are more concerned about climate change than older people;” “younger people contribute more to the climate movement than older people;” “younger people are leading the fight against climate change.” The second factor was composed of two items representing perceptions concerning younger people’s contribution to climate action as a nuisance: “younger people would do better to focus on school rather than climate policy;” “younger people are overly dramatic in their concerns about climate change.” Item loadings range between .69 and .84 and are described in Table 2. Cronbach’s alphas of the two subscales were .81 and .85, respectively. The two subscales were negatively correlated, $-.27^{**}$.

Finally, we examined convergent and divergent validity with existing measures (See Table 3). We found that older people were more likely to report negative perceptions concerning the involvement of younger people in climate action (e.g., more likely to view younger people as a nuisance) ($r = .17^{**}$) and less likely to report positive perceptions concerning the involvement of younger people in the climate movement ($r = -.23^{**}$). Compared with women, men were more likely to view younger people’s involvement and concerns about climate change as a nuisance ($r = -.18^{**}$). Education and positive attitudes toward older people’s involvement in climate action were not correlated with the two subscales. Negative attitudes toward older people’s

Table 2. Factor loadings based on exploratory factor analysis (*N* = 250).

Items	Younger people’s positive contribution to climate action	Younger people’s involvement in climate action as a nuisance
Younger people are more concerned about climate change than older people	.69	
Younger people contribute more to the climate movement than older people	.71	
Younger people are leading the fight against climate change	.84	
Younger people would do better to focus on school rather than climate policy		.80
Younger people are overly dramatic in their concerns about climate change		.84

Table 3. Correlations between study variables and perceptions of younger people's climate action.

	Younger people's positive contribution to climate action	Younger people's involvement in climate action as a nuisance
Age	-.23**	.17**
Gender (men-reference)	.02	-.18**
Education	.007	-.001
Positive attitudes toward older people in the context of climate change	-.03	.10
Negative attitudes toward older people's involvement in the context of climate change	.41**	-.18**
Climate change is a real phenomenon	.48**	-.59**
I am willing to pay higher taxes to fight climate change	.31**	-.45**

** $p < .01$.

involvement were positively correlated with positive views concerning younger people's involvement ($r = .41^{**}$) and negatively correlated with negative views concerning younger people's involvement ($r = -.18^{**}$). This means that those individuals who held more negative attitudes toward older people's involvement were more likely to view younger people's involvement in a positive light. They also were less likely to view younger people's involvement as a nuisance. Perceptions concerning younger people's positive involvement in climate action were highly correlated with the belief that climate change is a real phenomenon ($r = .48^{**}$) and with willingness to pay higher taxes to fight climate change ($r = .31^{**}$). On the other hand, perceptions concerning younger people's involvement in climate action as a nuisance were negatively correlated with the belief that climate change is a real phenomenon ($r = -.59^{**}$) and with willingness to pay higher taxes to fight climate change ($r = -.45^{**}$). Hence, those who viewed younger people's involvement as a nuisance were less likely to believe that climate change is a real phenomenon and were less likely to be willing to pay higher taxes to fight climate change.

Discussion

The changing climate is a major societal problem that must be addressed through solidarity and joint efforts given the enormity of the problem (Yarrow, 2009). Inequalities concerning climate change are numerous (Thiery et al., 2021). The changing climate has differential effects on people of different geographic origins, socioeconomic status, gender, and age (Brincat, 2015; Farber, 2020). Moreover, political power and ability to influence climate policies also vary based on these same characteristics. Temporal issues associated with current and future impacts of climate change are highly pronounced and take precedence in current climate discourse. It is younger people who are seen as leaders of the climate movement and older people who are seen as more reluctant to fight against the changing climate (Ayalon, 2020; Cloughton, 2021). Moreover, children

born in 2020 are expected to have a two-to-seven-fold increase in exposure to extreme events compared to those born in the 60's of the previous century. Hence, it is children and young adults, including those not yet born, who will be facing the brunt in terms of mental and physical health outcomes (Thiery et al., 2021). In this context of intergenerational tension (Ayalon et al., 2022) and the growing need for intergenerational solidarity and justice (Weston, 2008), the present study aimed to develop a measure to assess the perceived role of younger people in the context of climate change. Such a measure is important considering the temporal aspects of climate change, highlighted by the climate movement, and the need to foster intergenerational solidarity to achieve a healthy climate. The measure can be used to better track public attitudes over time with a focus on age and generation-based differences and similarities. Using such a measure over time will allow the identification of barriers to intergenerational solidarity as well as possible facilitators. The measure can also be used to assess interventions geared toward fostering intergenerational solidarity in the context of climate change.

The new measure is composed of two subscales that capture two dimensions associated with the role of younger people in climate action. The first dimension views the contribution of younger people to climate action in a positive light and acknowledges their leadership role. The second views younger people as a nuisance and their claims and actions as being overly dramatic. Both subscales have high reliability and although they are correlated, they demonstrate differential associations with other study variables, thus, attesting to the fact that they capture somewhat different constructs.

Overall, the newly developed measure demonstrated adequate convergent and divergent validity. As expected, age was correlated with both positive and negative views concerning the role of younger people in climate action – older people were more likely to view the involvement of younger people in climate action in a negative light and were less likely to view their involvement in a positive light, compared with younger people. This finding corresponds with past research demonstrating intergenerational tension around issues of climate change and further supports past findings concerning the more skeptical, less enthusiastic role of older people in the climate movement (Ballew et al., 2020). Nonetheless, these beliefs ignore the growing involvement of older people in the climate movement (Chazan & Baldwin, 2019; Narushima, 2004).

Gender also played a role in responses to the new scale. Men were more likely to view younger people's involvement in climate action as a nuisance. This corresponds with past research which has shown that engaging in green behaviors is stereotypically connected with femininity (Brough et al., 2016). Women are seen as more concerned about climate change issues and more willing to act (Mavisakalyan & Tarverdi, 2019). Moreover, it is primarily (young) women who lead environmental activism and participate

in climate action at local, community, national, and international levels (Sloam et al., 2022).

Education was not correlated with views about the role of younger people in climate action. This could be due to the interaction between education and political ideology in the case of climate change rather than with generational perceptions (Czarnek et al., 2021). Nonetheless, it is important to note that past research has highlighted the role of education as an important determinant of climate change attitudes, which largely has shown to interact with political ideology (Hamilton, 2011). For instance, a study conducted in the United States, has found that higher education strengthens conservative White men's denial of climate change impact (Ballew et al., 2020). A different study has shown that politically conservative ideology reduces the effects of education on climate change beliefs, so that conservative supporters, regardless of their education level, are less likely to take a scientific stand in the case of climate change. Hence, for political-left supporters, education strengthens pro-environmental attitudes, but for political-right supporters, the effect of education is weakened or negative (Czarnek et al., 2021).

We also examined the new measure against positive and negative attitudes concerning the involvement of older people in climate action. Positive attitudes concerning the involvement of older people in climate action had no correlation with perceptions concerning younger people's involvement. This is unexpected, given the assumption that pro-environmental attitudes would drive positive attitudes concerning the involvement of younger and older people, alike. However, negative attitudes toward the involvement of older people were positively correlated with beliefs about the positive contribution of younger people and negatively correlated with the view of younger people as a nuisance regarding climate action. This possibly attests to the presence of intergenerational tension in the climate movement and highlights the role of ageism in climate change discourse (Bergmann & Ossewaarde, 2020). Nonetheless, it is important to note that a recent scoping review has found a stronger evidence for intergenerational solidarity than for tension between the generations (Ayalon et al., 2022).

Finally, the strong associations between attitudes toward climate change and views of younger people in the context of climate change further highlight the strong leadership role taken by younger climate change activists. As youth are seen as the leaders of the climate movement (Cloughton, 2021), support for the youth-led climate movement is almost equivalent to acknowledging the changing climate and to supporting action to fight against the changing climate.

When considering the findings, it is important to acknowledge literature that argues for limited intergenerational divide (Murphy, 2021). This literature suggests that in addition to younger people who are excluded from the current discourse, voters and older people as well are excluded. Hence,

it is political economy, rather than intergenerational divide that drives current policies (Murphy, 2021). Moreover, a different study has shown that partisanship and race are more pronounced than age-related attitudinal differences. However, the study did note that compared with older people, younger republicans are more likely to believe in the scientific evidence behind climate change (Marlon et al., 2022). Others have shown, however, that generational divides exist even within supporters of the same political party. Compared with older people, millennials are more likely to believe that climate change is real and caused by human inaction even within the same political party (Ross et al., 2019). Although important, the present study has failed to address political ideology or race/ethnicity as a possible explanatory variable.

Despite its strengths and innovation, the present study has several shortcomings that should be acknowledged. First, this study offers preliminary evidence for the validity and reliability of a new tool to identify the perceived role of youth in climate action. However, further research is necessary to establish its criterion validity. Second, the present study was conducted in Australia, a country known for its political activism in support of climate action as well as for the high toll taken on its environment and citizens by the changing climate (Borg et al., 2019; Howard et al., 2017). Further research in other parts of the world is desired to examine whether indeed, our findings can be generalized to other populations. It also is important to note that the term used in the new measure, “younger people,” is somewhat crude. However, children and youth under the age of 18 are particularly susceptible to the negative effects of the changing climate, more so than people in their 20’s for instance. Moreover, the measure did not address intersectionality and topics such as sexuality, disability, or geographic region.

Nevertheless, the present study is important given the fact that it is one of the first to put the spotlight on ageism toward younger people in the context of climate change. The study developed and validated a new measure that captures both positive and negative views concerning younger people’s involvement in climate action. The tool demonstrated adequate reliability and validity and should be used in future research to better capture attitudes toward the involvement of younger people in the climate movement. This information can possibly be used to better understand barriers to and facilitators of intergenerational solidarity. The new tool highlights the need for the development of future interventions that bring generations together under a common goal of protecting the environment. Past research has shown that intergenerational contact can be effective in reducing ageism (Burnes et al., 2019). It is highly likely that intergenerational solidarity also will pose a stronger response to the current divisive discourse around climate issues. The new tool can be used to highlight the role of intergenerational relations in climate change beliefs and behavioral intentions.

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